

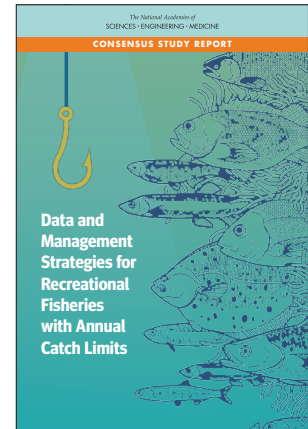


JULY 2021

Consensus Study Report

HIGHLIGHTS

Data and Management Strategies for Recreational Fisheries with Annual Catch Limits



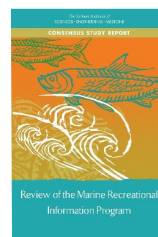
Marine recreational fishing is a popular activity enjoyed by more than 9 million Americans annually and is a driver of the American ocean—or blue—economy. Defined as “fishing for sport or pleasure” in the Magnuson-Stevens Fishery Conservation and Management Act (MSA), it is distinct from commercial or subsistence-oriented fishing in several ways, including the large number of participants and their varied motivations for fishing.

For some species, recreational fishing accounts for a significant amount of the total number of fish caught in a year. To ensure that fish populations are not overexploited, the National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration (NOAA), also known as NOAA Fisheries, collects information through the Marine Recreational Information Program (MRIP) survey program, a state–regional–federal partnership that includes in-person, telephone, mail-in, and other complementary surveys to estimate total recreational catch.

The 2007 reauthorization of the MSA responded to a growing awareness of the impacts of fishing by mandating that Regional Fishery Management Councils set annual catch limits (ACLs) to prevent overfishing for all managed species in federal waters. As noted in a 2017 National Academies report (see Box 1), although

MRIP has improved the recreational catch surveys, the surveys were never designed to meet the demands of in-season management of ACLs. In some cases, imprecise estimates of harvest have triggered accountability measures such as early season closures and reductions in future recreational ACLs, which have been a source of contention with the recreational fishing community.

This report assesses how well the current suite of MRIP surveys and other activities meet the needs of in-season management of fisheries with ACLs. This report presents approaches for optimizing MRIP data and complementary data for in-season management and considers alternatives for managing recreational fisheries with ACLs to better serve both social and economic management objectives.



Box 1. In 2017, *Review of the Marine Recreational Information Program* assessed progress in updating marine recreational fisheries data collection through MRIP over the previous decade. The report noted that establishing MRIP had resulted in significant improvements to recreational catch and effort surveys but that the demands of in-season management of ACLs often exceeded the temporal and spatial design of the surveys.

Recreational Fisheries Management and Surveys

The U.S. fisheries management process for recreational fishing includes scientific processes, administrative functions, and the monitoring of recreational catch relative to ACLs primarily using catch data from MRIP (see Figure 1). In-season management of recreational fisheries is informed by a combination of MRIP and state-sponsored recreational fishing surveys and data collection programs at the regional and state levels. In-season management needs vary by region and by fishery. While MRIP surveys and catch estimates do not cover all fishable U.S. marine waters, the program covers more than 90 percent of all U.S. marine recreational fishing trips and catch (see Figure 2).

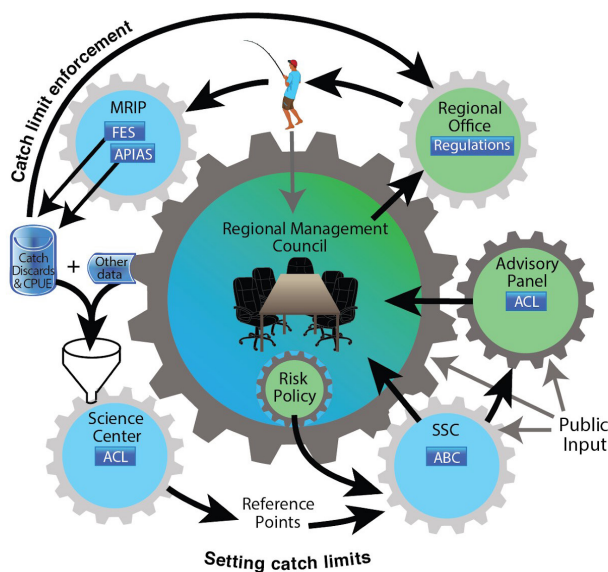


Figure 1. The fisheries management process for recreational fisheries in federal waters includes scientific processes (in blue), societal goals and/or administrative functions (in green). Monitoring of recreational catch relative to the ACLs is conducted by the regional Science Centers, primarily using catch data from MRIP.

Recreational monitoring programs often use a combination of mail or internet surveys, telephone interviews, creel surveys, and dockside sampling to estimate the level of catch and other relevant information about the fishery. The accurate and timely estimate of recreational fisheries catch is challenging because it occurs over a large number of diffuse access points (e.g., boat ramps, marinas, and private docks) and is sourced from a large number of participants.

Recreational fishing management therefore tends to rely on a two-step process of (1) instituting management measures (e.g., size, season and bag limits) that are forecast not to exceed ACLs, and (2) monitoring

of catch using a survey-based approach to provide a catch estimate, normally after the recreational season has ended. Several forecasting approaches may be used to project performance of a given set of management measures to maximize fishing opportunities while staying with the ACL.

MRIP has greatly improved the development and use of mobile apps and other electronic data collection and reporting platforms, a priority for many stakeholders and fishery managers. Since 2017, there has been substantial progress on the use of electronic logbooks by the for-hire sector and the ability of interviewers to capture and submit data electronically. For example, in 2021 the Gulf Fisheries Information Network transitioned all the Access Point Angler Intercept Survey (APAIS) data collection in the Gulf Region to tablet-based systems and is using automated data transfer to reduce the time needed to deliver the data for MRIP processing.

Need for Improved Precision, Timeliness, and Availability of MRIP Estimates

At smaller spatial scales and shorter time frames, alternative or supplemental (state) surveys have achieved a variety of benefits, including timeliness of estimates; spatial resolution; provision of additional information; and for certain fisheries and contexts, higher precision of estimates. Some alternative surveys, such as Louisiana's LA Creel, Mississippi's Tails n' Scales, Alabama's Snapper Check, and Florida's State Reef Fish Survey, have been certified by NOAA Fisheries, indicating acceptance of their survey designs.

It is possible that raw MRIP data streams could be used to inform more timely catch estimates through such approaches as nowcasting or other in-season projection methods. This report recommends that MRIP explore the costs and benefits of providing its partner fishery research and management programs in the regions and states with direct access to the continuous streams of raw MRIP data as they are being captured.

Another potential approach to increasing the timeliness of catch estimates is to transition MRIP to monthly rather than bi-monthly waves. For in-season management applications that rely on tracking MRIP estimates of cumulative catch against ACLs, the greatest advantage of moving to a 1 month cycle would come from monitoring cumulative catch at the end of the odd-numbered months.

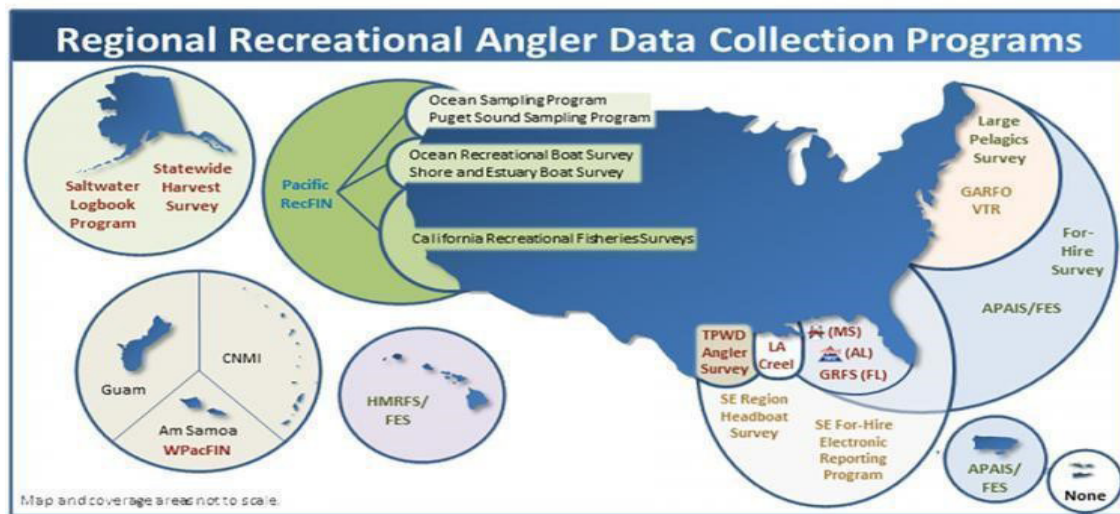


Figure 2. Recreational fisheries survey coverage within the United States, the majority of which are supported at least in part by MRIP. Surveys include the Access Point Angler Intercept Survey (AP AIS), Fishing Effort Survey (FES), For-Hire Survey (FHS), Northeast Vessel Trip Reporting (VTR) program, Southeast Region Headboat Survey, Southeast Region For-Hire Electronic Reporting (SEFHIER) Program, and Large Pelagic Survey (LPS). SOURCE: NOAA Fisheries (2014)

Public perceptions of differences between MRIP and alternative surveys in methodology, final catch estimates, and the precision of the estimates is a source of consternation among anglers, fisheries managers, and other stakeholders. Current efforts by MRIP and its partners in the area of survey inter-calibration should continue and, where significant differences between surveys exist in terms of final estimates or precision, the causes of the differences should be determined and communicated to the public.

Opportunity to Leverage Supplemental and Ancillary Data

Supplemental data from state-specific recreational fishery surveys, species-specific surveys (e.g., Red Snapper), as well as location-specific data, fishing tournament data, and voluntarily reported data (e.g., web portal and smartphone-reported data) could be used in combination with MRIP estimates to improve in-season management. Significant challenges would remain, however, concerning the calibration and coordination of supplemental recreational catch and effort data with MRIP estimates.

The potential for voluntary reporting to enhance fishery data collection has generated much excitement, but in practice, participation in such programs has invariably been extremely low. Unless these patterns are reversed, and biases in reporting are addressed, reliance on such voluntary data collection systems is unlikely to advance MRIP over the coming years.

In addition to MRIP's existing programs to calibrate its data and estimates with those of state surveys, additional statistical methods could be employed to facilitate the integration of data from multiple sources.

This report recommends that the NOAA Fisheries Regional Offices and Science Centers, and state agencies explore and identify ancillary variables that have high correlations with the Fishing Effort Survey and Access Point Angler Intercept Survey (AP AIS) response propensities, effort, catch per unit effort, and catch estimates and supplemental survey estimates for potential use in annual and in-season forecast models. Ancillary variables available electronically with high frequency (i.e., daily or weekly) would be most useful for in-season management catch forecasts.

Potential of Alternative Management Strategies

America's fisheries are among the best-managed in the world, a success attributable in no small part to the MSA. In addition to virtually eliminating overfishing, the law has contributed to the long-term stability of fish stocks, a profitable fishing industry, and a growing blue economy. As noted above, however, the implementation of ACLs combined with the enforcement of accountability measures has been a source of tension in recreational fisheries.

In response to the recommendations of recreational fisheries organizations and Regional Fishery Management Councils, the MFA specified that NOAA Fisheries and the Councils can implement alternative management approaches more suitable to the nature of recreational fishing as long as they still adhere to the conservation principles and requirements established by the MSA. Alternative management approaches that could be pilot tested include:

- The use of harvest tags for low-ACL, rare-event species; species of concern; species under Endangered Species Act recovery plans; or other species that may not be well suited for sampling by a general recreational fisheries survey like MRIP.
- Implementation of a private recreational fisheries license endorsement (or permitting program) focused on identifying the subset of licensed anglers that target Council-managed species (e.g., offshore components of the fisheries). This license registry could then be used to assist in the development of specialized surveys that could improve recreational fisheries data collection for sampling domains that are challenging for MRIP.

Adoption of mandatory, electronic catch reporting schemes combined with intercept sampling for verification has the potential to bring recreational catch monitoring to a level of precision and timeliness comparable to that achieved in commercial catch monitoring programs. Implementation of such mandatory reporting schemes could be considered for some recreational fisheries where precise monitoring and management are considered crucial.

Working With Stakeholders to Determine Optimum Yield

Balancing stakeholder needs and the cost of responsiveness to those needs requires consideration of the economic cost and benefits as well as benefits to long-term biological sustainability. The concept of optimum yield (as defined by the MSA) offers opportunities for better informing this discussion. The report recommends that NOAA Fisheries and the Councils develop a process for engaging recreational fisheries stakeholders in a more in-depth discussion of optimum yield and how it can be used to identify and prioritize management objectives that are better suited to the cultural, economic, and conservation goals of the angling community.

COMMITTEE ON DATA AND MANAGEMENT STRATEGIES FOR RECREATIONAL FISHERIES WITH ANNUAL CATCH LIMITS

Luiz R. Barbieri (Chair), Florida Fish and Wildlife Conservation Commission; **Yong Chen**, Stony Brook University; **Chris Dumas**, University of North Carolina Wilmington; **Michelle Duval**, Mellivora Consulting; **Steven G. Heeringa**, University of Michigan; **Kai Lorenzen**, University of Florida; **Sean Powers**, University of South Alabama; **Steven Scyphers**, Northeastern University; **Tien-Shui "Theresa" Tsou**, Washington Department of Fish and Wildlife; and **Zhengyuan Zhu**, Iowa State University. *Staff of the National Academies of Sciences, Engineering, and Medicine:* **Constance Karras** (Study Director); **Alexandra Skrivanek** (Associate Program Officer); and **Trent Cummings** (Senior Program Assistant).

For More Information . . . This Consensus Study Report Highlights was prepared by the National Academies of Sciences, Engineering, and Medicine based on the Consensus Study Report Data and Management Strategies for Recreational Fisheries with Annual Catch Limits (2021). The study was sponsored by the National Oceanic and Atmospheric Administration. Any opinions, findings, conclusions, or recommendations expressed in this publication do not necessarily reflect the views of any organization or agency that provided support for the project. Copies of the Consensus Study Report are available from the National Academies Press, (800) 624-6242; <http://www.nap.edu> or via the Oceans Studies Board web page at <http://www.nationalacademies.org/osb/ocean-studies-board>.

Division on Earth and Life Studies

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

Copyright 2021 by the National Academy of Sciences. All rights reserved.