



Gulf States Survey Transition Research Plan

Research Plan Development Team

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Background

In the Gulf of Mexico, federal general surveys were historically the sole source of catch and effort statistics for recreational fisheries covering Florida through Louisiana, while Texas has operated its own state survey since the 1980s. In recent years, Annual Catch Limit (ACL) management needs for red snapper and other recreationally targeted species led to the development and [certification](#) of new state surveys that have either replaced or supplement NOAA Fisheries' Marine Recreational Information Program (MRIP) general surveys. State surveys were benchmarked with the MRIP general surveys over various periods of time, which facilitated their potential use in regional management and stock assessments. Some state surveys designed to supplement MRIP continue to be conducted side-by-side, allowing for updated calibrations, or the rescaling of estimates from one survey design to another, to be able to make meaningful comparisons between different data sets. [Limited benchmarking with MRIP methodologies](#) was also conducted in Louisiana and Texas.

State surveys in general produce estimates that tend to be lower when compared directly with overlapping MRIP estimates, and in some cases differ substantially. This has generated a growing interest in understanding the drivers of those differences and identifying potential sources of error that should be accounted for in each survey methodology to improve accuracy.

Reducing sources of survey error increases the likelihood that survey estimates of catch and effort are representative and comparable for management purposes. Accurate and precise estimates are necessary for sustainably managing and fairly allocating marine fisheries in the Gulf of Mexico.

It is not unusual for different statistical survey designs to result in different estimates for a given parameter. This is because using different survey methods introduces different sources of variation and bias unique to those methods, which may drive estimates apart. These differences can generate challenges for stock assessments and management. Bias in one or more survey estimates included in the sum of recreational catch may lead to biases in the resulting stock assessments, sector allocations, and harvest monitoring, which may further result in misinformed management decisions (e.g., being more conservative in setting regulations and quotas). It is therefore essential to understand the potential sources of bias in both federal and state surveys.

While some work is already underway, understanding survey error and how best to address it is an ongoing, iterative process. We need a clear blueprint to prioritize resources so research efforts are focused on survey improvements that will result in the greatest possible benefits. The goal of this research is to improve the accuracy and precision of estimates used to assess and manage recreational fisheries in the Gulf region.

To achieve this goal, the objectives of this plan are to:

- Fully document each survey methodology
- Work collaboratively to explore drivers that explain differences across overlapping surveys
- Outline a timeline for implementing necessary improvements
- Transition to new or improved methods and data streams

This plan identifies the highest priority actions, as well as potential longer-term investments. This plan is a living document and will be updated when priorities, needs, and/or resource availability shift.

Short Term (2024-2025)

The Research Plan Development Team developed the following plan informed by statistical consultant recommendations ([Gulf Transition Plan, Appendix A](#)) that can be accomplished over a two-year time frame, provided sufficient resources are available to fund the research and improve the respective surveys.

1. Projects related to documentation and methodological reviews

Project 1.1: Develop and document GulfFIN Recreational Data Standards. The Gulf States Marine Fisheries Commission's Fisheries Information Network (GulfFIN) Committee identified warehousing state recreational survey data at the GulfFIN Data

Management System as the highest priority project. A necessary first step is establishing GulfFIN Recreational Data Standards using [Inflation Reduction Act \(IRA\)](#) funding allocated to help make infrastructure improvements within the Gulf states' and commission's data systems. This includes developing standards (variables, formats, definitions) for each data module that best meet the needs of science and management. The team will seek guidance from the existing [federal recreational data standards](#) while focusing on standards that address state recreational survey priorities. This project will help ensure interoperability and standardization of data coming from each state. All state survey documentation (e.g., implementation design, quality control processes, estimation procedures, delivery schedules) will be collected and available through the GulfFIN Data Management System. GulfFIN is hosting a workshop in fall 2024 to develop recreational data standards and discuss development of standardized databases for centralized warehousing (data storage and access). In 2025, the team will begin developing databases and processes. IRA funding is also being used to improve existing GSMFC and state partner data management systems. Our current goal is to have a system in place to receive data from all five states in 2026.

Project 1.2: Texas state data calibration. The survey design and procedures used in Texas have not undergone a statistical review. The lack of data available to calibrate state estimates limits the ability to obtain reliable Gulf-wide estimates (for [SEDAR 74](#), a single year of NOAA Fisheries Fishing Effort Survey (FES) administration in Texas was used to calibrate state estimates for red snapper). Documentation of the survey design and procedures used in Texas should be reviewed through collaboration between state and federal scientists, including independent reviewers, so a statistically robust method for calibrating estimates from Texas can be developed. Some additional effort survey benchmarking in Texas (for example, the FES or the LA Creel effort survey component) would be beneficial, but funding is currently unavailable to support this priority. This project would help improve Gulf-wide estimates.

Project 1.3: Review the process for producing sample weights, variance estimates, and Quality Assurance/Quality Control procedures for all surveys. A team of statistical consultants at the [2022 Gulf Transition Workshop](#) recommended a review of estimation methodologies. The intent is to confirm methods correspond appropriately with their sampling designs (e.g., reflecting stratification and multi-stage sampling). Reviewing quality assurance/quality control procedures, strengthening them where necessary, and standardizing them to the extent possible will facilitate consistent statistical rigor of data products across different survey programs.

This process will be more efficient once all state recreational survey data is available through the GulfFIN Data Management system. Therefore, this project may not start until 2026 when the database is operational.

Project 1.4: Review intercept data from in-person interviews from all surveys to increase efficiency of interview site selection. This project could help determine if observed trends in landed fish observed correlate to effort and harvest estimates. This has primarily been a priority for Alabama and Mississippi. The forthcoming centralized database of state recreational survey data will also aid this analysis.

2. Projects related to collaborative, experimental research that explores drivers that explain differences across overlapping surveys

Some of these projects involve side-by-side comparisons of overlapping surveys intended to inform potential design changes and calibrations. Benchmarking comparisons are funding-dependent, and, currently, projects have no more than 1 year of funding available. Generally, the duration of these comparisons should be evaluated on a case-by-case basis. Longer benchmarking periods (2+ years) are preferable when trend information derived from different methods are likely to change over time (e.g., large changes in data collection modes or detecting a source of non-sampling error that is likely to vary over time). In other cases, differences between methods may be more stable (e.g., addressing a specific type of non-sampling error in a survey method that isn't likely to impact trend information), therefore, extended benchmarking is unnecessary. There are also tradeoffs between supporting calibration (multi-year side-by-side comparisons) and implementing a survey improvement quickly. The Gulf Transition Team Subgroup will collectively weigh these considerations as these studies progress to best prioritize available resources.

Project 2.1: LA Creel Effort Survey Study in Mississippi and Alabama. Throughout 2024, Mississippi and Alabama are testing the LA Creel telephone survey method for estimating fishing effort. This project deploys the same type of effort survey Louisiana uses with the intent of generating a new estimate of fishing effort to compare with existing FES estimates for Mississippi and Alabama licensed anglers. Alabama is using their existing offshore designation to help target phone calls to anglers fishing offshore. Mississippi is deploying an offshore designation for its anglers to help target anglers fishing offshore. A secondary goal is to produce expanded harvest estimates by combining pilot effort estimates with Access Point Angler Intercept Survey (APAIS) dockside survey data and comparing those with MRIP and state capture/recapture survey estimates for species covered by the existing state surveys. This approach has the potential to bring three states into a more standardized approach for recreational catch and effort data collection.

Study duration: 1 year with currently available funds
Start date: January 1, 2024

Project 2.2: MRIP Fishing Effort Survey expanded study. NOAA Fisheries conducted a pilot study to evaluate potential reporting error in the recreational FES. The FES is a household mail survey administered from Maine to Mississippi and in Hawaii. It collects

recreational fishing trip information for boat and shore fishing from private anglers and is used to estimate total angler trips taken from each state over two-month waves. The [initial FES pilot study](#) results, published in 2023, suggest the order of the questions in the survey may lead to anglers misremembering trips and result in overestimation of fishing effort. The follow-up study is being conducted throughout 2024 alongside the current FES to compare results with a revised design that changes the order of two fishing activity questions and also increases survey administration from every two months to monthly. Monthly sampling will produce more frequent estimates, which is a priority of both the Atlantic and Gulf MRIP regional implementation plans (developed by the Atlantic Coastal Cooperative Statistics Program and GulfFIN, respectively). A shorter respondent recall period may also minimize reporting errors.

Study duration: 1 year

Start date: January 1, 2024

Project 2.3: Evaluation of Fishing Effort Adjustment and Allocation in Florida.

NOAA Fisheries and the Florida Fish and Wildlife Conservation Commission are working collaboratively on a multi-part study to evaluate differences in fishing effort estimates generated through MRIP and the State Reef Fish Survey (SRFS) on the Gulf and Atlantic coasts of Florida using alternative methods for estimating the geographic distribution of fishing effort. The analyses will help explain whether under-coverage adjustments and varied procedures for estimating the magnitude of effort attributed to the Gulf and Atlantic coasts of the state may explain observed differences between effort estimates from the two surveys.

A mail survey will be used to directly estimate fishing effort on the Gulf versus Atlantic coast of Florida. The questionnaire will be mailed to separate samples of households in Florida. The estimated distribution of fishing trips between the Gulf and Atlantic, derived from the mail questionnaire, will be compared to distributions derived from intercept samples through APAIS, which are currently used to partition FES effort estimates between the coasts. SRFS mail survey responses will be used to estimate total statewide reef fish effort by state residents. Intercept survey data collected through APAIS will be used to account for limited coverage of non-resident anglers and to estimate total statewide fishing effort for both the Gulf and Atlantic coasts of Florida. Resulting estimates will be compared with effort estimated directly from SRFS mail survey responses to evaluate potential sources of bias.

Study duration: 2-3 years for study planning and implementation (contingent on available funding)

Start date: To be determined

Project 2.4: License Sensitivity Study. NOAA Fisheries implemented a pilot study that tests the hypothesis that the content of a survey (e.g. types and order of questions) will result in differential sensitivity to license reporting. Specifically, the study hypothesizes

that respondents who are asked about fishing activity are more sensitive to license reporting than those who are not, resulting in a greater likelihood of license reporting. We tested this hypothesis by administering four mail survey questionnaires that varied in the inclusion and placement of fishing activity and fishing license questions. The study used the FES sampling and data collection designs and was administered in Florida and South Carolina in July and August 2023. A report describing the results will be tentatively available in fall 2024 following peer review. NOAA Fisheries will work with Gulf Transition Team Subgroup members on any next steps associated with the findings.

Long Term (2025+)

3. Model-based calibration research using microdata (raw survey data) available from all different surveys. This is an alternative to relying on final state and MRIP estimates.

Note: This research is not currently funded. For this reason, this is a longer-term priority. Statistical consultants indicate this would likely take one to two years to develop.

Project 3.1: Finding comparable components within state surveys and MRIP. The estimates produced by the state surveys differ substantially from the MRIP estimates due to differences in sampling designs, estimation methods, and/or survey modes. This makes it difficult to identify and quantify all possible sources of non-sampling error. It might be possible to identify components of the state surveys that are more comparable (like the public-access intercept surveys), and which could be used to create more harmonized estimates. All the states and NOAA Fisheries conduct the intercept catch surveys in person, and they have similar sampling designs for site-days. It is possible to obtain estimates of catch directly from these intercept surveys. These estimates are not as precise as the capture-recapture or the two-survey estimates, but they are likely to be less impacted by differential non-sampling errors (e.g., differences in coverage error, which occurs when members of a target population are omitted, duplicated, or wrongly included in a sample frame; differences in non-response error, which occurs when a member of the sample is unable or unwilling to respond to a survey and differs in some key characteristic from those who do respond; and differences in measurement error, which includes data-processing errors, data collection errors, errors due to the survey mode, and errors related to questionnaire design). We recommend investigating whether this could provide a way to create a consistent benchmark for the relative catch of the states.

Project 3.2: Collect side-by-side data for additional benchmarking in states where multiple programs do not exist.

- a. In Texas and Louisiana, consider conducting FES to support existing FES calibrations.

- i. This is needed to address issues associated with the MRIP FES calibration coefficients used in SEDAR 74 (and likely future stock assessments for other species) that were based on a single year of MRIP data in Louisiana (both APAIS and FES were conducted in the state in 2015) and MRIP-like data in Texas (FES was conducted in the state in 2016, so catch estimates were produced by combining the FES data with the Texas intercept survey data).
- ii. In all states, consider a research pilot to implement some form of standardized data collection to support calibrations among all existing data collection programs; depending on the design, this could also relate to Project 3.1.

Executing the Research Plan

The Gulf Transition Subgroup composed of Gulf state and federal fisheries scientists will convene on a regular basis throughout 2024 and 2025 to share information among the partners, collaborate on joint research projects, discuss progress to date, and prioritize further study. Throughout this period, the Gulf Transition Subgroup will consider a longer-term plan for improving all the surveys in the region.