

Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2025-2028

The following list of research and monitoring priorities is organized in four main sections: (I) broad multi-purpose monitoring, and survey programs; (II) fish biology and stock status concerns; (III) social, cultural, and economic concerns; and (IV) ecosystem considerations. The first section contains recommendations for monitoring and survey programs, social and economic issues, and ecosystem-based management concerns. Additional social and economic priorities are in **Section III**, and those for ecosystem management are in **Section IV**.

The Gulf of Mexico Fishery Management Council (Council) recognizes that there are many information gaps that could be addressed to improve conservation and management in the Gulf of Mexico (Gulf). This is a list of high priority topics and should not be viewed as an exhaustive list. The Council also acknowledges the dynamic nature of fisheries including rapid changes in ecological, social, or economic conditions that affect Gulf fisheries and it is expected that additional priorities may emerge within the 2025-2028 period that are not encompassed in this list. This list is provided to partner agencies, funding agencies supporting fisheries research, individual investigators, and the public to broadly share the current needs to promote continued conservation and management of Gulf fishery resources including social and economic benefits of fishery resources.

I. Priorities associated with broad, multi-purpose and data collection and monitoring programs.

- a. **Fishery-Independent Sampling**: Nearly all Gulf stock assessments since 2019 have recommended expanded fisheries-independent monitoring programs with enhanced focus on environmental data, habitat type and quality and spatial coverage, and physical oceanographic parameters. In 2023, the G-FISHER composite video survey was standardized across the Gulf, and its use should be considered for all reef fish species. Expanded sampling efforts should be implemented to develop long-term time series of physical, biological, and chemical oceanographic data for use in future ecosystem-based and climate-ready modeling approaches. Research and technology advancements to automate data processing and improve the timeliness of data for use in stock assessments and management should be considered.
- b. **Fishery-Dependent Monitoring and Sampling**: Nearly all Gulf stock assessments since 2019 have recommended improved or enhanced existing recreational (i.e., for-hire and private vessel components) and commercial fishery-dependent sampling programs. Presently, biological, social, and economic sampling could be improved through expanded temporal/spatial coverage, particularly for data-poor stocks. The Council supports the development and implementation of an effective and efficient electronic data reporting system for the recreational components of the fishing community, beginning with the charter for-hire vessels. Any efforts and emerging technologies to support more timely private recreational landings information with low uncertainty for management and stock assessment needs would also be supported.
- c. **Estimation of Bycatch**: Implement more comprehensive species identification and abundance information for reef fish and coastal migratory pelagic species incidentally harvested as shrimp trawl bycatch. Continue collecting information on bycatch from

reef fish and coastal migratory pelagic fisheries for all vertical line and bottom longline gear types. Disseminate practical methods for minimizing bycatch. Prioritize expanded observer coverage, which is a critical part of monitoring fishing effort, shrimp-trawl bycatch estimation, interactions with endangered species, and fishing gears. Continue to explore electronic monitoring such as vessel-mounted video monitoring and other artificial intelligence tools as appropriate for improving bycatch estimations in fisheries.

- d. **Estimation of Discard and Discard Mortality Rates:** Develop research and monitoring programs to evaluate the magnitude and effects of discard mortality rates (both commercial and recreational) and continue developing practical methods for minimizing mortality. Consider approaches to quantify changes in discard mortality associated with the use of release gear and consider population and harvest implications of this practice. Assess the studies on efficacy of venting and descending devices for reef fish species in the Gulf to realize and integrate improved estimates of dead discards by species, sector, and fleet as applicable.

II. Priorities associated with individual species.

The Council is responsible for managing fisheries to prevent overfishing and achieve sustainable populations. When a stock's biomass falls below established thresholds, it is classified as overfished, and the Council must develop rebuilding plans to restore the biomass to a level consistent with the maximum sustainable yield. While all species under the Council's management would benefit from additional research and data to enhance conservation efforts, the Council has prioritized its research objectives on overfished stocks currently under rebuilding plans. In the Gulf of Mexico, these include red snapper, gag, greater amberjack, and gray triggerfish.

Research that improves our understanding of life history, habitat usage, vulnerability to episodic events, and more accurate estimates of catch, discards, and fleet-specific interactions with each species would greatly support the Council's efforts. Research needs for each assessed species is outlined in their respective stock assessments, which are available on the SEDAR website (<http://sedarweb.org>). Additionally, the Council has identified "key stocks"; important fishery species prioritized for regular stock assessments. These species include red snapper, red grouper, gag, greater amberjack, and gray snapper. Each key stock has a current stock assessment and research recommendations, also accessible on the SEDAR website.

III. Economic and Social Recommendations

Over the next four years and beyond, fishery management challenges will increasingly pertain to the human environment resulting in social and economic effects that will require improved information to better inform management decisions. These social and economic data, analyses, and tools aim to inform managers on the benefits and tradeoffs of fishing opportunities under finite quotas and allocating scarce resources among competing user groups.

- a. Estimate the effects of potential management alternatives for the recreational sector.

Evaluate the economic effects of regulations for recreational fisheries such as (but not necessarily limited to): minimum size limits, bag limits, quotas, seasonal closures, and marine protected areas. Economic effects include changes in economic value (consumer surplus for fishermen, producer surplus for charter and headboat operators), levels of fishing effort and catch, and switching behavior among target species and other forms of recreational activities in response to regulation.

- b. Develop methodologies to assess the economic and social impacts of individual fishing quota (IFQ) management in Gulf fisheries; evaluate markets for IFQ shares and annual allocations, including impacts of vertical integration.
- c. Develop fishing behavioral models, including effort, supply, and production functions for the commercial and for-hire sectors. Specific attention should be given to species targeting behavior, and seasonal and spatial decisions. Determine how fishermen change their fishing practice and strategies, including what species to target in response to changes in management tools such as seasonal closures, area closures, industry quotas, trip limits, minimum size limits, etc. This includes switching behavior among fishing activities and the rates at which boats enter or exit the fishery, as well as changes in fishing practice by non-quota holders following implementation of catch share programs.
- d. Continue the development of social and economic indicators, such as those employing factors of vulnerability and resilience. Develop scales to use social and economic indicators as triggers for evaluation of fishery management decisions (e.g., allocation, fishing zones).
- e. Evaluate the social and economic impacts of ecosystem management on the various categories of stakeholders to support National Standard 8 of the Magnuson-Stevens Act regarding the impact of an ecosystem approach on fishing communities.
- f. Develop models for evaluating social and economic impacts of allocation or reallocation decisions. Evaluate the appropriateness of various incentive-based approaches for the management of recreational fisheries and assess their socioeconomic effects.
- g. Develop methods to assess land-use changes and the impact of land-use change on vulnerable human populations.
- h. Evaluate effectiveness of communication and stakeholder engagement approaches including opportunities for stakeholders to provide input to stock assessment and management processes and barriers to participation; effects of engagement opportunities on stakeholders' perceptions of management processes and opportunities for meaningful participation; and related issues.

IV. Ecosystem-Based Management Recommendations

Data Collection Priorities: As the Council moves toward assessing and incorporating ecosystem approaches for better informed management decisions there are several data gaps that must be filled. To become more responsive to real-time changes, including those driven by climate, several areas of data collection and analysis are necessary to improve our holistic understanding of the ecosystem and to support informed decision-making. First, it is important to evaluate human

components, such as climate-induced changes in fishing behaviors, including responses to productivity changes, species distribution shifts, or the impact of extreme events, as well as to assess the potential social and economic impacts of implementing ecosystem-based fisheries management. Additional needs include up-to-date information on the spatial extent, type, and health of habitats (e.g., coral, mangrove and hard bottom habitats which act as spawning and nursery grounds for key fisheries species) as well as species utilization. More frequent evaluations of habitat and species abundances and diversity within Marine Protected Areas and Habitat Areas of Particular Concern are also needed. A better baseline understanding of species ecological interactions, such as trophic interactions, predator-prey, and competition are critical for assessing and quantifying the potential effects of environmental changes on fish communities. Spatially explicit catch data and long-term habitat monitoring data will help inform fishery responses to environmental changes, while the development of ecosystem indicators—covering biological, climatological, physical, and human dimensions—will assist in assessing ecosystem conditions and guiding management decisions. Finally, continued efforts are needed to assess the effects of episodic mortality events, such as red tides, hypoxia, and extreme temperature fluctuations, by developing metrics for incorporating these mortalities into abundance indices and improving predictive abilities for future events.

Fishery Ecosystem Plan Development: The Council is developing a Fishery Ecosystem Plan centered around individual Fishery Ecosystem Issues (FEI), each of which are issue-specific fishery management problems that extend beyond typical single stock management approaches and can potentially be addressed with Council action. Each FEI will proceed through a scoping process that will identify research needs targeted toward the issue, so the ecosystem-focused research priorities will grow as we move forward with FEI development. Outside of the FEI process, the long-term goal for ecosystem-based management is to develop data and methods to conduct integrated ecosystem assessments (IEA) for the Gulf, and to provide the necessary information to effectively adapt management to mitigate the ecological, social, and economic impacts of major shifts in the productivity and mortality of living marine resources, including climate driven impacts. In the near-term, continued development of predictive ecosystem models to project fisheries productivity, assess uncertainty in stock assessments, improve single-species management, and evaluate impacts of proposed management actions from an ecosystem perspective will help the Council move toward ecosystem approaches to management. To achieve these aims, ecosystem models are needed to project and forecast fish productivity while accounting for factors such as marine development (e.g., offshore energy and aquaculture), environmental perturbations (e.g., hurricanes and red tides), long-term climate change, trophic dynamics, and interjurisdictional productivity shifts.