

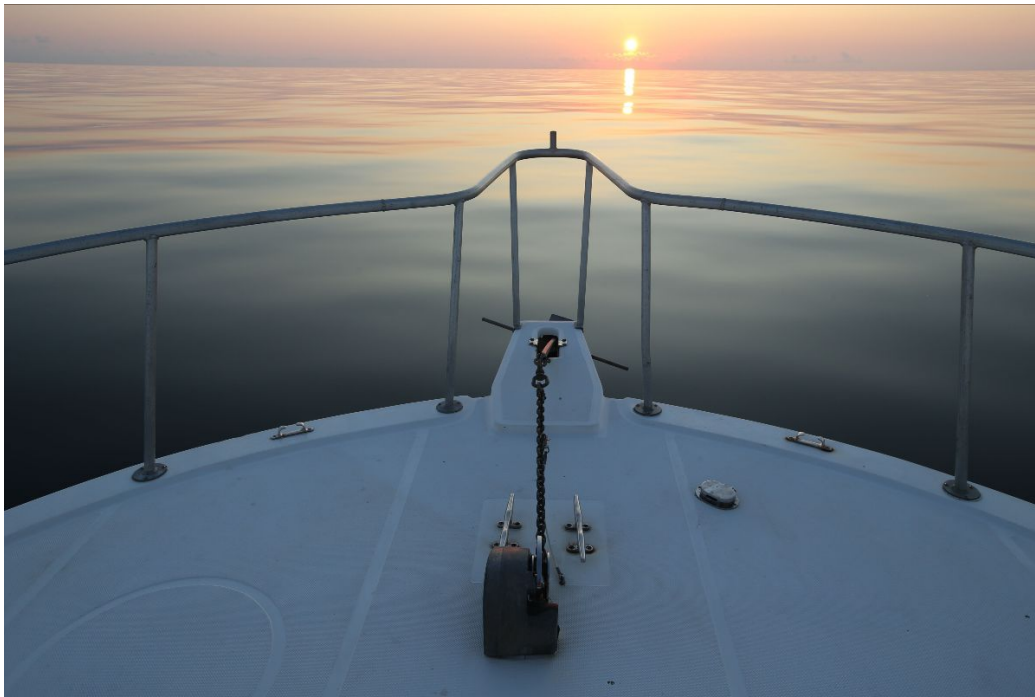


Issue 26, Summer 2022

MASGP-22-001-02

The Value of Stakeholder Knowledge

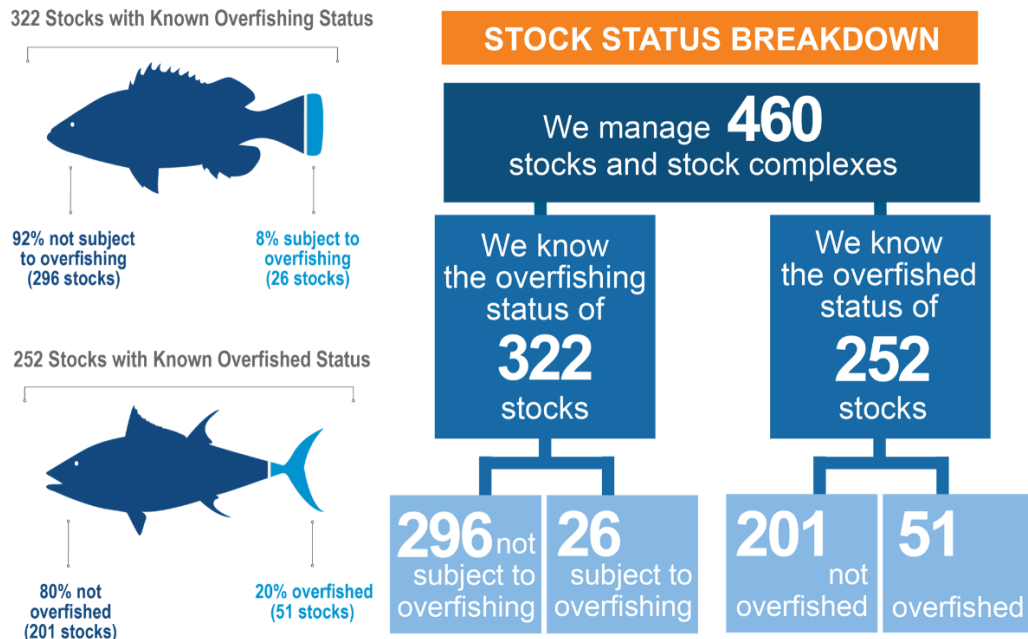
It's early in the morning, so early that the sun has yet to peek above the crest of the horizon. The world breathes calmly and deeply, and no land is in sight – a still, quiet peace that is only tangible in the early morning hours. As the bow of the boat gently parts the water, the glimmer of bright green light from bioluminescent phytoplankton contrasts against the blackness of the depths, mirroring the white stars sprinkled across the night sky above. Time passes, and soon yellow rays begin to stretch across the sky, illuminating the world with the soft radiance of the morning sun. As the sun climbs to its zenith, the division between water and sky becomes almost imperceptible, with only the ever-shifting, glassy reflection of the water distinguishing it from the sky's uniform, pastel blue.



Sunrise on the Gulf of Mexico. Photo by David Hay Jones.

The untamed beauty and extraordinary diversity of the Gulf of Mexico has captured imaginations, fueled flourishing trade and economies, and birthed distinct cultural heritages that continue to thrive in the present day. While tales of conquest, survival, and persistence defined the exploration of the American frontier – America’s Wild West – the Gulf’s allure, captured through colorful spectrums of writers and artists, and told through mosaics of fishermen tales and legends, soon made it “America’s Sea.” And for good reason: the Gulf has significantly higher biodiversity than any other marine region of the United States and holds the coveted title of the birthplace of American saltwater sportfishing.

The Status of our Stocks



Graphic taken from the NOAA Fisheries 2021 Status of Stocks report showing current fish stock status breakdowns in the United States.

Perhaps not surprisingly, unlimited exploitation of the Gulf’s myriad resources led to depletions that altered and crippled a once prolific and bountiful ecosystem. Resources that seemed inexhaustible quickly became scarce, and the need to protect them became central to the development of fisheries management. At the heart of rebuilding once-depleted fish stocks lies the implementation of fishery regulations by fisheries management bodies. These entities are entrusted to protect ecosystem health while maintaining and encouraging economic growth and community resilience. Fisheries management efforts have rebuilt more than 40 fish stocks nationwide since 2000 and resulted in near-record lows of overfished stocks and stocks subject to overfishing (see the [NOAA Fisheries 2021 Status of Stocks report](#)).

However, managing fish stocks to meet competing needs while ensuring sustainability does not come without its challenges, including increasing costs for research and operations, limited personnel capacity, and difficulty sampling and monitoring a vast oceanic environment. Additionally, many fisheries problems require solutions that cannot be addressed by a single discipline or methodology and are often complicated by significant knowledge gaps. Furthermore, frustration among stakeholders (i.e., fishermen) with respect to fishing regulations can jeopardize effective communication between stakeholders, scientists, and management agencies.

Citizens as Scientists



Shark depredation is becoming an increasing problem for fishermen in the Gulf of Mexico. Photo by David Hay Jones

The integration of citizen science (data collection by non-professional researchers) and cooperative research (collaboration between stakeholders and scientists to co-produce knowledge for management purposes) can bridge perspectives between fishery managers, scientists, and stakeholders. These efforts enable fishermen's knowledge and experience to flow into the scientific process. Although citizen science and cooperative research have historically been underused in management, new efforts are depending heavily upon the knowledge and experience of fishermen stakeholders to address (and begin to solve) an emerging and prevalent issue in the Gulf of Mexico known as *depredation*.

Depredation, defined as the partial or complete removal of a hooked fish – say, a red snapper – by a non-target species, such as a shark or another predator, can impact the accuracy of stock assessments and the effectiveness of fisheries management efforts. For example, failure to account for depredation can lead to the underestimation of fish mortality and, in turn, inappropriate harvest recommendations. In recent years, shark depredation has been increasing, particularly in the reef fish (snappers, groupers, etc.) fishery. These interactions, which result in decreased catch and profits, have become a

prominent point of discussion during Gulf of Mexico Fishery Management Council (GMFMC) meetings. Although fishermen have urged fishery managers to implement solutions to depredation, a necessary precursor to implementing solutions is developing a comprehensive understanding of the issue. Depredation trends in response to time, location, depth, and other factors have not been adequately described or evaluated... until now.

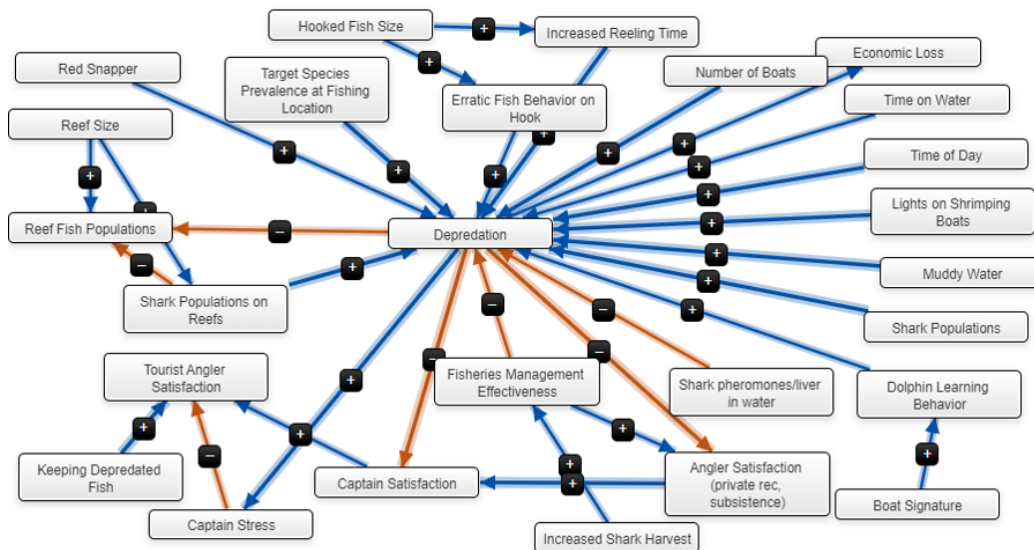
Local Ecological Knowledge



Alabama captains contribute to the participatory mapping process by identifying areas of depredation hot-spots and building the Alabama depredation community map.

Last month, a group of fisheries and social scientists, fishery managers, and outreach specialists hosted a collaborative workshop to understand and characterize reef fish depredation in the Gulf of Mexico. The workshop was led by our group (MSU Marine Fisheries Ecology) and funded by the National Oceanic and Atmospheric Administration's RESTORE Science Program. More than 20 charter-for-hire captains from all five Gulf of Mexico states contributed to a participatory mapping process – a group-based, collaborative research method that gives stakeholders the freedom to shape discussion and share viewpoints with minimal intervention from researchers. Captains from each state

discussed and identified components most important to understanding the scope of depredation. Using these factors, researchers developed regional depredation community models – visual products that capture perceptions and beliefs to describe a problem within a community. The end result is like a food web: components that are connected via directional arrows that can increase or decrease based on changes in perceptions, actions, and environmental processes. The depredation community models not only showed which factors increase or decrease depredation based on captains’ knowledge and experience, but also showed distinct differences in the perceptions and extent of depredation between Gulf of Mexico states.



An example of a community model developed by Alabama captains at the collaborative depredation workshop held last month.

But that’s not all. Through collaboration and moderated group discussion, captains also identified areas where depredation is most common (called “hot-spots”), the species primarily responsible (i.e., sharks, dolphins, or other predators), and the amount of catch lost to common depredators – specifically, sharks and dolphins. Continued discussion also provided an opportunity to evaluate possible solutions to reef fish depredation in the Gulf of Mexico, which included implementing an effective shark harvest and using effective shark deterrents, such as the [SharkBanz Zeppelin](#) and shark necromones. Necromones, or scents given off by a dead organism, can be detected by sharks, and anecdotal evidence suggests that shark necromones may deter sharks from feeding and hunting within an area. While the specific solutions varied between Gulf states, the consensus was that a complex problem like depredation would benefit from a multifaceted approach to solutions and that there is a need for more collaborative research on the effectiveness of shark deterrents in minimizing depredation interactions.

A Way Forward



Marcus Drymon of Mississippi State University details the tangible outputs created during the workshop that will advance our understanding of Gulf of Mexico reef fish depredation and inform future mitigation strategies.

Overall, last month's workshop represents an innovative first step in developing a comprehensive understanding of depredation in the Gulf of Mexico reef fish fishery. The workshop fostered active stakeholder involvement and interaction that resulted in the co-production of knowledge among stakeholders, researchers, and resource managers, and gave stakeholders a greater capacity to contribute to science and management discussions. We look forward to continuing to work with stakeholders across the Gulf of Mexico to further our understanding of depredation and work toward effective and lasting solutions.



Marcus Drymon



Lindsay Mullins



Alena Anderson



Danielle McAree



Ana Osowski



Amanda Jefferson

I'm Marcus Drymon, an Assistant Extension Professor at Mississippi State University and a Marine Fisheries Specialist at Mississippi-Alabama Sea Grant. Lindsay Mullins, Alena Anderson, Danielle McAree, Ana Osowski, Amanda Jefferson, and I are the Marine Fisheries Ecology Lab. We'd love to hear from you! Please reach out to us at marinefisheriesecology@gmail.com



Facebook Website

Copyright © 2022 Mississippi State University Marine Fisheries Ecology, All rights reserved.

Want to change how you receive these emails?
You can [update your preferences](#) or [unsubscribe from this list](#).

