GULF OF MEXICO FISHERY MANAGEMENT COUNCIL ECOSYSTEM ACTIVITIES

Council review of regional ecosystem planning and Council advisory bodies

The Gulf of Mexico Fishery Management Council (Council) has been incorporating ecosystem principles into its Fishery Management Plans (FMPs) for over 30 years. The Council has a dedicated Ecosystem Committee to discuss ecosystem factors at the management level. This committee recently reviewed the Southeast Fishery Science Center's (SEFSC) work on a developed Ecosystem-Based Fisheries Management Policy and Road Map. The report included results from participatory workshops throughout the state of Florida to identify fishing community priorities. From this work, the SEFSC characterized water quality as being a major ecosystem concern among fisheries stakeholders. Additionally, the Council's Sustainable Fisheries Committee provided a comment letter on NOAA's Climate Southeast Regional Action Plan to the agency and encouraged future presentations from the SEFSC as it completes the directives outlined in the plan. To help aid in ecosystem management decisions, the Council has two ecosystem-specific advisory bodies: the Special Ecosystem Scientific & Statistical Committee (SESSC) and the Ecosystem Technical Committee (ETC). The SESSC is generally convened with the Council's Standing Scientific and Statistical Committee (SSC) to provide an ecosystem perspective when discussing fishery-science issues.

Example of ecosystem considerations in fisheries management

Most recently, ecosystem factors were directly incorporated into the stock assessment process for red grouper (*Epinephelus morio*). Red grouper is a protogynous hermaphrodite broadly distributed along the west-Florida shelf. Generally, they are long-lived species with sex transition not occurring until approximately age-11 years. The species is known as a "habitat engineer" because it creates and maintains excavations in the bottom substrate which supports other species that use these excavations as sources of food and refugia. This site-fidelity behavior and complicated life history makes the stock susceptible to discrete environmental disturbance events such as red tide blooms. These red tide events can result in markedly high mortality, which is problematic for a stock that experiences targeted harvest from both the commercial and recreational sector.

A stock assessment for red grouper (SEDAR 61) was recently completed with the base model incorporating data streams through 2017. Projections were to be estimated starting in 2018; a year in which southwest Florida experienced a large red tide bloom. To account for the effects of this event, red tide severity was directly incorporated into the proposed yield projections. First, SEFSC staff convened a series of workshops along the Florida Gulf coast to survey red tide histories as reported by stakeholders living in affected communities. This report was reviewed by stock assessment analysts during the SEDAR 61 data workshop. The report indicated that stakeholders categorized the 2018 red tide event as "devastating". It was noted that recall bias may have been an influence on this determination as a 2014 red tide event was observed to have been more severe than the 2018 bloom but was not previously mentioned by stakeholders as

having an impact on the stock. Still, the social study and empirical scientific study provided rationale for estimating the effects of red tide events within the stock assessment model. This process allowed stock analysts the ability to generate model outputs informed by varying degrees of red tide severity. These results were ultimately reviewed by the Council's SSC and SESSC and catch levels, directly accounting for a relationship between environmental phenomena and stock health, were recommended for management to the Council.

Development of a Fishery Ecosystem Plan

Recognizing the importance of ecosystem considerations in fishery management policy, the Council has been focused on developing a Fishery Ecosystem Plan (FEP). To aid in the development of the FEP, the Council has directed the ETC to provide guidance and draft the document. To date, the ETC has met on three occasions. During the first meeting held in March 2020, the ETC reviewed FEPs developed in other fishery management regions, discussed the regulatory authority of the Council in the context of ecosystem management, drafted an FEP development schedule and mission statement, and finally outlined sections to be included in the FEP. The Council decided to contract work to LGL Ecological Research Associates Inc. (LGL) to help develop the FEP. During the ETC's second meeting held September 2021, the Committee heard a presentation from LGL providing a mid-term project update and provided feedback to the investigators. At its most recent meeting in December 2021, the ETC was provided an update from LGL. The update included identification on project outcomes, summarization of lessons learned from other Council's FEP, recommendations on gathering feedback from stakeholders and a report on ecosystem indicators. The ETC recommended a formal mechanism for operationalizing the considerations of Fishery Ecosystem Issues (FEIs) within the FEP.

The Council received a draft FEP and presentation from LGL at its April 2022 meeting. Supplementary documentation for the FEP included case studies and lessons learned from fishery ecosystem planning, stakeholder assessment and concept mapping, and indicator development for fishery ecosystem planning. The Ecosystem Committee was supportive of the concept of identifying FEIs within the plan and recommended that procedure be implemented to help prioritize the best ways to address the FEIs. The Council's Ecosystem Committee offered a number of other recommendations, which were noted in the associated meeting summary report. Council staff is looking to convene the ETC in the spring of 2023 to continue the development of the FEP.