Tab E, No. 6a

Ecosystem Based Fishery Management Working Group
Gulf of Mexico Fishery Management Council
Gulf Council Conference Room
Tampa, Florida
September 19, 2014
8:00 a.m. – 5:00 p.m.

Work group members present:

Cameron Ainsworth	Columbus Brown	Mandy Karnauskas	Will Patterson
Harry Blanchet	Matt Freeman	Walter Keithly	Sean Powers
Benjamin Blount	Steven Jacob	Kai Lorenzen	James Simons

Gulf Council Staff:	**Council Members:**	**NMFS Staff:**	**Public:**
Steven Atran	Roy Williams	Mike Jepson	Chad Hanson
John Froeschke			Frank Gable
Morgan Kilgour			
Karen Hoak			

A meeting of the Ecosystem Based Fisheries Management Working Group (group) was held on September 19, 2014.

The Council had two charges for the group: (1) to develop a set of suggested goals and objectives of an ecosystem based fisheries management plan that considers measurable targets and (2) to develop approaches for identifying and prioritizing ecosystem and socioeconomic information needs for fisheries managed by the Council.

The group was presented with a brief overview of past workshops addressing ecosystem based fisheries management (EBFM) including stakeholder and modeling workshops. In the past, there were attempts to develop an EBFM plan, but efforts and priorities changed and the plan was never fully developed. The recommendations from these workshops were also presented to the group. The group evaluated what "EBFM" means and determined that an EBFM does not necessarily need its own fishery management plan but should incorporate ecosystem components into these assessments.

Human community profiles typically are constructed through a combination of secondary data and social data collected by researchers who work directly in the communities. The latter process, however, can be very time consuming and expensive. Profiles can also be established through rapid assessment procedures, in which only a week or two is spent in a community, but those are not sufficiently quantitative for ecosystem assessments. Rapid assessment can be used effectively to correct time-lagged data in large secondary data sets, secondary in the sense that the data were collected for other needs. Using secondary data and short-term field research to establish social indicators, multiple communities can be evaluated and can produce quantitative results. Social indicators relate to issues such as: fishery dependence, population, resiliency and vulnerability and disaster indicators (hurricanes, tornadoes, sea level rise), and gentrification.

The group discussed understanding what analyses are available and what is tangibly accessible to address EBFM in the near future. Several examples of particular assemblages/species complexes were discussed (shrimp fishery, coastal pelagics, grouper complexes). The group discussed that there are current efforts to address ecosystem components into assessments, but most of these attempts are lacking the human dimension component.

The group agreed that stock assessments should continue to incorporate environmental covariates and use these models to give scientific advice on the probability of specific status determinations based on environmental factors. Some human dimension data could be used such as fisherman behavior in response to specific events. The ABC control rule could also have reduced uncertainty/discounts with the incorporation of environmental components that may drive recruitment and survival; this could lead to better projections and not just the current state of the stock. The MSE work on red grouper is currently attempting to address this scenario. MSE projections are sensitive to the future state of recruitment and changes in fisher behavior affecting the stocks. Additionally, the current state of some stocks may be affecting other stocks (e.g. gray triggerfish may be hindered by the expansion of the red snapper population).

Most of the assessment and management is at the stock level. The fishery is usually managed by taking information from the target stock and catches. To incorporate the ecosystem into management, factors from the environment and responses to regulations/management in fishing behavior is also important should be included. The group reviewed the Hobday et al. 2011 approach. The group felt that the Hobday et al. 2011 approach could easily be completed and an MSE be used to evaluate how different projections could affect the stock. For example, if projections are very sensitive to fishing behavior, then the priority research needs would be to address understanding fishing behavior. There are different levels of analyses that can be used, and the regional or community level should be focused on, especially for social analyses. Travel costs, shortened season costs, number of days lost fishing, etc. would all be region and sector specific. It was suggested that existing data could be used to address many of the questions such as how fishing behavior changes with episodic events, open-access versus IFQ fishing regulations, or changes in fish abundance.

The group discussed the desire for stability and how stability is an ambiguous term. If the objective is to have stable access, then having higher yields is not effective. Increased biomass could lead to more stability in terms of yield and resilience to episodic events. In the for-hire and commercial sectors, there is desire to predict quota. The recreational fishery desires are season length and access. There was discussion on needing direction from the Council about what its desired management objectives are (e.g. higher bag limits vs. fishing all year; open access vs. higher CPUE). Understanding these questions will help the group optimize the tools. It would be beneficial if the group could communicate the tradeoffs to the Council for balancing the modeling approach. The group should identify questions to present to the Council to streamline the process.

The group discussed the utility of the Hobday et al. 2011 approach and suggested adding specific modifications as appropriate for the Gulf. There is currently an effort to develop an MSE for red grouper; the outputs of this MSE could be useful for implementing the approach that was presented. Some of the red grouper work is unfunded, but there is effort to complete the work along with the assessment. Atlantis is also being used to test the harvest control rule for the grouper complex.

The social the economic goals and objectives need to be considered such as fisher behavior. The dynamics of the socioeconomic realm is what is important for the Hobday et al. approach. There were two episodic events that could be investigated with fishing behavior response, red tides and hard freezes. These data could be incorporated and investigated, but more systematic investigation for changes in fishing behavior in response to specific regulations is warranted. The social science data may already be available for many of these metrics.

The short term goals were to incorporate the Hobday et al. approach with specific fisheries. Fisheries that were presented were red snapper, shrimp, data poor species, and lionfish. The fisheries that have been identified as being particularly useful are shrimp and red grouper. Lionfish was suggested as a useful non-fishery species. The shrimp fishery has economic, effort, and other data that will be straightforward to apply to the framework; however, there are also complex fisheries interactions such as bycatch and trawling impacts that are not easily accounted for. The red grouper fishery is already under investigation by the integrated ecosystem assessment team. Lionfish was discounted mainly because it is not a managed species, but the effects of lionfish on managed species from predation as a covariate would be appropriate. There was considerable discussion about the importance of habitat for many of these fisheries. Diet studies were also addressed as important for filling in gaps.

The group discussed the metrics table for information needs for Gulf fisheries (Appendix A). Overall, a better communication of the tradeoffs to the Council would be the best approach.

Short term goals

- To identify the four categories of information needs for the shrimp fishery as a preliminary example of how this approach can work (by January SSC meetings)
    - March 5 draft due to group
    - Group input due March 12, 2015
- To identify the four categories of information needs for the red grouper fishery as a preliminary example of how this approach can work (by January SSC meetings)
    - March 5 draft due to group
    - Group input due March 12, 2015
- Next to fill in the Hobday et al. approach (and modify as necessary) for the different fisheries (working group to present to SSC in March)
- Conduct an analysis using this framework (end of 2015) and clearly communicate the consequences for short term versus long term effects for management (2016)
- Consider how to incorporate this process (framework) into the management process (2016)

Long term goals

- To continue to give scientific advice with respect to the probability of overfishing in light of environmental factors as modeled in single-species assessments.
- To conduct management strategy evaluations to examine the efficacy of current management approach and control rules to avoid overfishing in light of environmental covariates.
- To employ existing and soon-to-be online ecosystem models to examine factors effecting productivity of exploited resources as well as measures of overall ecosystem health.

    - Ecosystem models being developed or have been developed for GOM should continue to identify and incorporate ecosystem components into the assessment process and into management objectives
- To understand what the factor the Council would like as having low variability from year to year (e.g. # of days, # of fishermen, quota, yield, money, people/access, habitat and limiting factors)
- Complete the stepwise approach suggested in the Hobday et al. paper and adjust as needed for use in the Gulf of Mexico (e.g. hazard identification at each steps).
- Separate out the ecosystem and human dimensions for operational reasons

References

Hobday, A.J., Smith,A.D.M., Stobutzki, I.C., Bulman, C., Daley, R., Dambacher, J.M., Deng, R.A., Dowdney, J., Fuller, M., Furlani, D., Griffiths, S.P., Johnson, D., Kenyon, R., Knuckey, I.A., Ling, S.D., Pitcher, R., Sainsbury, K.J., Sporcic, M., Smith, T., Turnbull, C., Walker, T.I., Wayte, S.E., Webb, H., Williams, A., Wise, B.S., Zhou, S. 2011. Ecological Risk Assessment. Fisheries Research 108: 372-384.

Appendix A.

	Influences on the fishery	Impacts of fishery/management
Socio-economic	- Fishing behavior responses (changing location, high grading, species targeted, season, gear, discards, price, technology) - Fishery components - Fishing behavior drivers: regulations (season length, catch shares, gear) - Work force - Number/location of processors	- Recreational fishery - For-hire recreational fishery - Commercial fishery - Catch shares - Changes in fishery selectivity - Motivation to assist data collection/ management decisions - Ecosystem services? - Regulations (season length, catch shares)
Ecosystem	- Climate (temp, salinity, hurricane frequency, freshwater inflow, etc) - Currents - Weather (hurricanes, rain, etc) - Episodic events (e.g. Red tide mortality, hypoxia, freezes) - Anthropogenic events (pollution, oil spills, etc) - Indicators? - Habitat - Bycatch - Species interactions - Invasive species	- Bycatch from one fishery on another - Protected species bycatch - Diet data (predator prey dynamics) - Gear impacts - Habitat impacts (restoration, damage)