GROUNDFISH MANAGEMENT TEAM REPORT ON AREA MANAGEMENT UNDER TRAWL RATIONALIZATION

Introduction

Currently, the Council uses latitudinal and depth-based spatial management measures, as well as gear restrictions, to achieve area management objectives. Latitudinal area management is outlined in the acceptable biological catch (ABC) and optimal yield (OY) tables within the biennial specifications (e.g., North 40°10 N. Latitude and South 40°10 N. Latitude) and in the trip limit tables where, in some instances, limits differ from the ABC/OY delineations because of bycatch considerations. These subdivisions were created based on species abundance and stock assessments results. Regulations relative to rockfish conservation areas (RCA), boundaries which approximate various isobaths along the coast, achieve depth-based area management. Gear restrictions have also been implemented to achieve area management. For example, large footrope gear restrictions for bottom trawlers have been used to limit access to rocky habitat, areas that depleted rockfish species inhabit.

As evidenced by the March 2007 groundfish inseason action, increasingly complex spatial management measures may be necessary within the existing management framework. Intersector allocations and the implementation of trawl individual fishing quotas (TIQ) may further increase the need for spatial management, perhaps in a manner different than status quo. A thorough evaluation of the cumulative consequences of spatial management measures, both current and those expected from future initiatives, should be undertaken. Additionally, research efforts and analyses of current data sources is needed to support more refined area management approaches. This paper considers biological, economic, and administrative aspects of area management as well as their relevancy to the proposed TIQ program.

Biological considerations

A recent National Research Council (NRC) report found that "Spatial analyses may be one of the greatest obstacles faced by fishery managers." Several literature reviews of contemporary modeling abilities have noted that applied fisheries science has lagged behind more academic research in marine and terrestrial ecology with respect to an increasingly "spatially-rich" interpretation of population structure and complexity (Wilen 2004, Pelletier and Mahevas 2005). Such issues will be integral elements of fisheries science and management in the future, and advances in both assessment methods and simulation techniques should provide the means to better cope with the challenges of incorporating such complexity in the face of increasingly complex and spatially explicit management regimes (NRC 2006).

West Coast groundfish management has clearly become increasingly spatial. In addition to the RCAs, spatial management measures such as "hotspot" or "coldspot" analyses are increasingly available to help identify areas where available target species might be accessed with acceptable impacts on overfished species. Such measures benefit management actions by allowing fishing to occur on healthy stocks while minimizing the bycatch of rebuilding species. Yet the

underlying causes and consequences for spatially varying abundance and bycatch rates are often unclear. For example, the RCA configuration adopted in March 2007 to minimize canary rockfish bycatch created a spatial management regime considerably more complex than past management measures, yet this regime was implemented without the knowledge of whether the differences in high versus low bycatch rates by area reflected habitat association and stock distribution, or historical patterns of depletion that leave depleted (low bycatch) regions more vulnerable to localized depletion. There are also some legitimate concerns that the implementation of a TIQ program could result in the spatial concentration of fishing effort. Over larger spatial scales, such issues speak not only to the potential impacts of localized depletion, but to issues of equity with respect to historical exploitation rates and subsequent allocation of allowable catches.

The Cape to Cape group suggested that management of West Coast fisheries would benefit by matching the spatial scales of interest for coastal communities with those scales naturally found within marine ecosystems. The evidence reviewed in that statement suggests while nearshore ecosystems exhibit marked regional differences in their species composition, dynamics and productivity, and the specialization of associated fishery, offshore ecosystems (particularly the slope ecosystem and species) tend to have more population connectivity and more homogenous distribution and life history characteristics. Yet even at a coastwide scale, spatial differences in fishing mortality can lead to altered perceptions of stock status depending on the spatial scale at which a given stock is assessed. For example, sensitivity analysis of different stock boundaries for the shortspine thornyhead stock assessment in 2006 demonstrated that overall depletion and status was considerably more optimistic with a coastwide assessment relative to an assessment that only included the four International North Pacific Fisheries Commission (INPFC) areas north of Point Conception.

Spatially-explicit management has proven to be critical to meeting conflicting management goals and objectives, such as maintaining fishing opportunities on healthy stocks while reducing incidental catches of rebuilding species, and meeting habitat protection requirements. Furthermore, there is a growing appreciation of the significance of heterogeneity in population structure for most marine organisms, as well as for the potential interaction between population structure and fishing behavior, that scientists and managers alike will find increasingly necessary to confront in population models and management measures. An example is the research, that has been presented to the Council, that recommends the need to spatially preserve larger, older females in rockfish populations to enhance larval viability and survival (Berkeley, et al 2004).

The GMT has frequently recommended that a more strategic consideration of the cumulative consequences of spatial management measures be undertaken, and that efforts be made to develop information to support more refined area management approaches. Current spatial management utilizes six INPFC boundaries and twenty two other available management lines (Agenda Item E.5.b, GMT Report, March 2007). However, these management lines may not represent natural stock breaks. A concerted research effort to compile and review available data on landings, survey indices, population structure and other factors could be part of a long term strategy to inform area management. As part of this effort, the GMT recommends accessing the expertise and information being developed outside the immediate Council process with regard to spatial management (e.g., the PMCC "Cape to Cape" Workshop and the upcoming Temperate

Reef Workshop). Additionally, an ecosystem based fishery management plan could act as a coordinating mechanism for evaluating and perhaps implementing spatial management measures. However, it may be unlikely that these overall efforts will provide sufficient information in time to inform further spatial division of quota shares beyond our current OYs prior to the planned implementation of the TIQ program. The GMT recommends incorporating current area management tools within the TIQ program, recognizing the limitations, and continue to pursue research and data that may further inform spatial management. As data become available, area management within the TIQ program is expected to evolve and adapt.

Economic considerations

Area management within a TIQ program has the potential to generate both positive and negative economic impacts. Positive economic impacts may occur at a regional level if IFQ shares are area based. Catch harvested from an area-specific IFQ would most likely be landed in adjacent ports, which would disperse economic activity along the coast, providing community stability, as opposed to being concentrated in a few regions. However, creating area-specific quota could also have negative economic impacts. The fishing industry requires the flexibility to adapt to changing market conditions and quota shares based on small geographic scales may reduce this flexibility. For example, non-whiting trawl vessels in the Astoria fleet routinely travel to areas near the US/Canada border. Area-specific quota shares could restrict fleet mobility, which may limit access to target species that are not evenly distributed along the coast. Additionally, finer scale area-specific quotas could restrict the fleet's ability to adapt to market changes. In order to avoid this situation, care should be taken when creating area-based quota so that area-specific IFQ shares are not so small as to erode the economic gains typical of rationalization programs.

Administrative considerations

The feasibility of implementing area-based management and the ability to adapt to area-based scientific information, after the implementation of a rationalization program, are important considerations. An overly complex program designed to achieve area-based management objectives may increase operational costs and may be too bureaucratic to adapt to changing fishery and environmental conditions. Area-based quota shares substantially increase program complexity because each area may require quota shares by species, by permit, a set of minimum holding requirement rules, and a set of concentration-of-ownership rules amongst others. When determining the number of areas with quota share designations, administrative cost and burden should be balanced with economic and biological considerations.

In addition, a program that is too rigid to adapt to new scientific information (such as information suggesting a modification of area-based management tools) may result in a fishery that is unable to easily take into account negative biological consequences that may be occurring. In order to avoid this scenario, information can be collected in a rationalized fishery that could be used to modify area-based quota share allocations if necessary. For example, location of catch by vessel could continue to be recorded in a rationalized fishery and used in a manner to re-assign shares on an area basis. It may be prudent to specifically identify evaluation of the adequacy of any existing area-based quota management as part of the periodic routine review being considered for the TIQ program.

Data Sources

- Retained catch data by area from trawl logbooks
- Spatial distribution of West Coast Groundfish Observer Program (WCGOP) data
- Spatial distribution of National Marine Fisheries Service (NMFS) trawl survey data
- Landings data by port from RecFIN. These data could also be summarized by the 6 INPFC areas

The GMT has requested from the Northwest Fisheries Science Center the catch data, WCGOP data, and NMFS trawl survey. Landings data by port (1994-2005) are already available from information assembled for the GAC. The GMT will review this information, once available, and then identify potential remedies. However, the entire analysis likely cannot be completed in time for TIQ or intersector allocation.

GMT Recommendations

1. The GMT recommends that the TIQ program incorporate area management tools currently in use and continue to pursue data and research informing spatial management. Depending on the results of the data compilation and review, determine whether and how spatial management concepts could be used in developing fishery management measures for the 2009-2010 biennium as well as the development of an Ecosystem Fishery Management Plan.

PFMC
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Sources

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