

Groundfish Fleet Reduction Information and Analysis Project

A joint project of Ecotrust and the Pacific Marine Conservation Council (PMCC)

Principal Investigator: Astrid J. Scholz, Ph.D.

Ecotrust, Presidio, Building 1007, PO Box 29189, San Francisco, CA 94129, Tel 415 561 2433, Fax 415 561 2435, ajscholz@ecotrust.org, www.ecotrust.org

Background Document for the October 29 - November 2, 2001 meeting of the Pacific Fishery Management Council

This document is intended as background and basis for discussion about the recently instituted Groundfish Fleet Reduction Information and Analysis (GFR) project. Together with presentations to the Groundfish Advisory Panel (GAP) and Science and Statistic Committee (SSC), it is intended to solicit comments and feedback on the scope, design and methodology of the GFR project. The principal investigator and other members of the Ecotrust/PMCC project team will be available for questions, comments and discussions at the November meeting.

Project Background

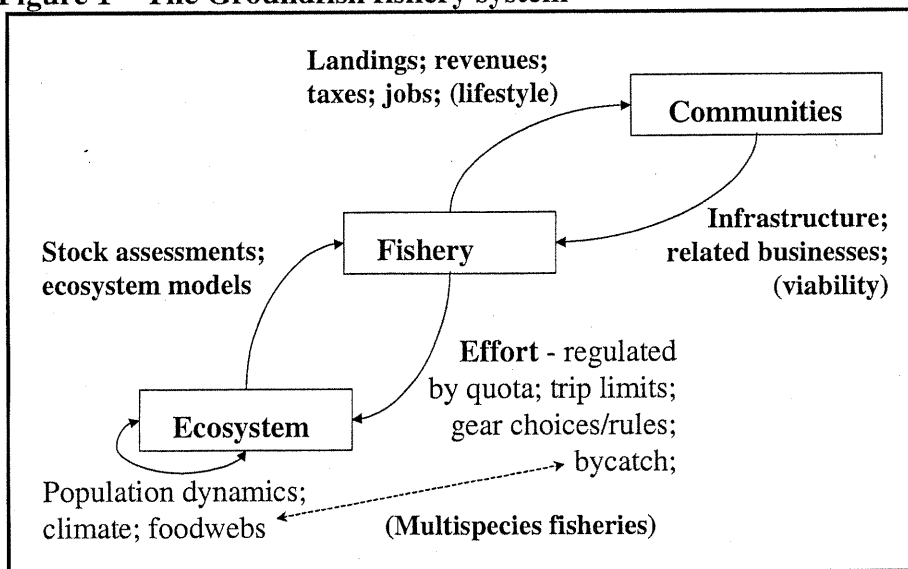
In October 2000, the Pacific Fishery Management Council (PFMC) adopted a strategic plan for the groundfish fishery entitled "Transition to Sustainability" (www.pcouncil.org/Groundfish/finalsp.html). This is a multi-faceted, comprehensive plan for the orderly transition of the presently overcapitalized fleet into a smaller, more ecologically and economically viable one. The PFMC plan calls for a coast-wide fleet reduction of at least 50%, and identifies the need to do so with sensitivity toward existing fleet composition by port and gear type. The core objective of the strategic plan is to facilitate the transition of the fishery such that harvest capacity is brought in line with resource productivity. Invariably, this transition will be costly and not without painful adjustments. However, as the council points out, the price of inaction, and of continuing the overcapitalization of the fleet and erosion of the natural resource base, is potentially even higher.

A key concern in transitioning to sustainability is assessing the effects on various participants and sectors of the fishery, and minimizing or mitigating transitional effects on individuals, businesses and communities. Such an assessment is at present made difficult by the lack of systematic analysis that links and integrates ecological and socioeconomic information about the coast-wide fishery system. To fill this gap, Ecotrust and the Pacific Marine Conservation Council (PMCC) have entered into a collaborative project to assess the impacts on communities. The GFR project will compile and structure existing information, as well as provide a spatially explicit analysis of the re-structuring of the groundfish fleet in Oregon, Washington, and California. Products include a framework and set of tools for conceptualizing the future sustainability of the fishery.

Analytical Approach

For the purpose of the GFR project, the groundfish fishery can be understood as a complexly linked system comprising the ecosystem, fishery activities and management, and coastal communities (see Figure 1). In somewhat stylized terms, the ecosystem, for example, enters into fishery considerations via stock assessments and other models that bound the allowable catch considerations. The fishery in turn expends effort to harvest the resource, bringing landings, revenues and associated effects to communities. The purpose of the GFR project is to investigate the multiple linkages between these three subsystems in spatially explicit terms. Using existing quantitative data on the relationships between the fishery, the ecosystem and coastal communities (bolded terms indicate categories of available data in Figure 1), and analytical characterizations of some qualitative issues or complexities arising from these relationships (the bracketed terms in Figure 1), there are two directions the spatial analysis will take. This spatial analysis will be done for historical responses to policy changes and other variables, both to test our system model and in order to illustrate the system dynamics over time and identify some drivers of change. It will also extend forward, building scenarios of responses to proposed management changes, notably – but not necessarily restricted to – different fleet reduction options.

Figure 1 – The Groundfish fishery system

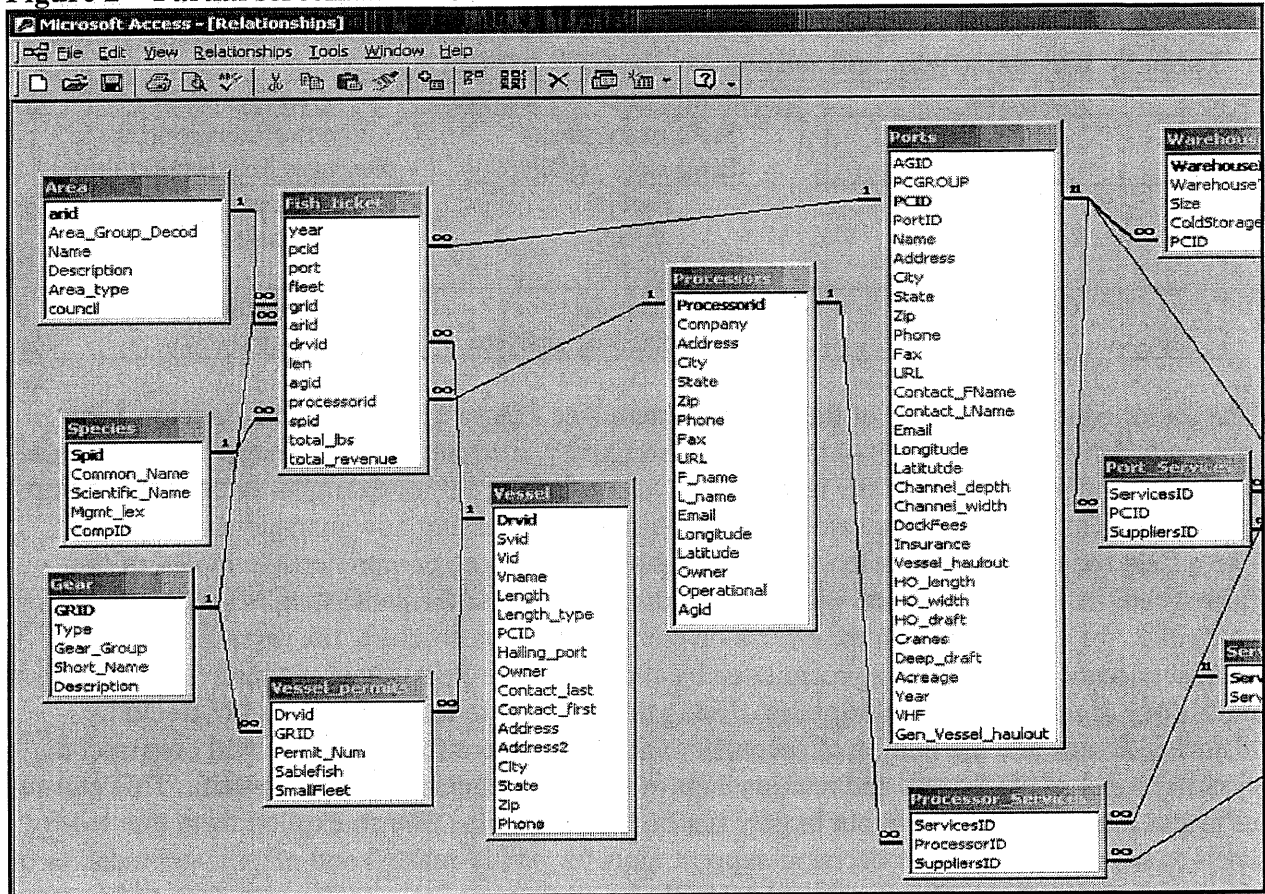


Methodology

The analysis for the GFR project proceeds along an iterative trajectory, using three key methodological elements: a relational database, a comprehensive systems model, and spatial analysis. During the first phase of the project, between now and the end of the year, we are compiling quantitative and qualitative data about the fishery into a *database*. To date, mainly fisheries dependent data (Fishtickets, logbooks, etc.) have been gathered and used to structure a relational SQL database (see Figure 2). The database continues to grow as additional data is

integrated, including economic and census data, community, port, and business profiles, and ecological and biological information on groundfish and the habitats that support them.

Figure 2 – Partial screenshot of GFR database



In addition to the quantitative data available, we expect to make use of secondary sources and qualitative information pertaining to fleet stratification, vessels likely to be most at risk and/or most willing to leave the fishery, and lessons from other parts of the country (notably the Alaska IFQ experience and the New England fleet reduction program). We are developing a protocol for interpreting secondary sources as well as for conducting and coding semi-structured interviews with scientists, managers, fishermen, and other people familiar with or involved in the fishery. These qualitative data will guide our exploration and querying of the database, and will be used to formulate hypotheses about the effects of particular fleet reduction options or other measures.

Some of this qualitative data contains proprietary business or other sensitive information. In addition to the confidential data handling protocols we are using for PacFIN and other semi-public databases, we are therefore developing a protocol for handling and reporting information conveyed in interviews and collected from other sources in a manner that is consistent with the confidentiality requirements of our informants. We are particularly sensitive to the need to protect identifying information that would allow audiences of the GFR project reports and products to link particular information uniquely to one vessel, business, or community. This data-handling protocol allows us access to key data such as operating costs of fishing and

fishing-related businesses, thus adding an important piece to the comprehensive analysis of socioeconomic effects at the community level of fishery-wide management measures. Table 1 contains a summary of the kinds and sources of quantitative and qualitative data we are drawing on, and that describe the ecological, fishery, and community/socioeconomic subsystems.

Table 1 - Key data types and sources for the GFR project

<i>Subsystem</i>	<i>Quantitative data and sources</i>	<i>Qualitative data</i>
Ecosystem	Stock assessments Ecosystem models	Foodweb relationships Essential Fish Habitat info
Fishery	PacFIN EFIN RecFIN	Business profiles Gear/vessel stratifications
Communities	Census data Regional planning analyses	business profiles and market analyses

The initial conceptual sketch of the fishery system (see Figure 1) serves as the skeleton for a *comprehensive systems model* of the groundfish fishery. Current fishery management implies a particular and partial view of the underlying system, embodied, for example, in the relationship between stocks and allowable catch. For the purpose of assessing how management measures like a fleet reduction would affect the fishery, however, a more comprehensive model of the fishery and its interdependence with coastal communities and the ecosystem is needed. In particular, we are focusing on the effects on community infrastructure, tax revenues and other socioeconomic characteristics precipitated by changes in the fleet, either planned (fleet reduction) or unplanned (bankruptcies). Using the database to test hypotheses generated by historical trends and the mining of secondary and qualitative information, we will construct a system model of the drivers and relationships of the comprehensive fishery system. This allows us to put many of the known, but largely implied, relationships into an explicit form that lends itself to simulations or other decision-support tools for policy-makers and other constituencies of the groundfish fishery. The system model will also serve as an intermediary product, to be reviewed by an informal group of GFR project advisors (currently being solicited) as well as in public forums and venues, including – but not limited to – the trade show FishExpo, PMCC’s fish forum next spring, and a variety of newspapers and newsletters. These review mechanisms and opportunities for receiving feedback are intended to give the GFR project transparency and accessibility. This transparency, together with our widely publicized contact information, is intended to engage participants, researchers and observers of the fishery that are not usually represented in policy arenas for fishery management.

The bulk of the analysis for the GFR project will center on the *spatial analysis* of the data assembled in the database. Despite the obvious applications to fishery management, spatial analysis has not been widely used to put data that are customarily collected for fishery management and science on the West Coast into spatial relations. Putting data and information that people do not usually consider in geographic terms into spatial relations to each other, then, forms a central element of the GFR spatial analysis. Another aspect of the GFR spatial analysis is that it combines data from different sources and formats together on an integrated GIS platform, using ArcInfo and ArcView software. This allows us to display historical effects and future scenarios in geographically explicit ways, and consider management measures across a number of different spatial and informational scales. For example, it may be interesting to

consider the spatial shift in effort in response to past regulatory measures (e.g. the regulations mandating the diameter of trawl foot ropes) in the context of other changes, such as the market structure of the processing sector or seasonal shifts in target species or fishing locations. An iterative analysis of the data in this spatial context will guide the formulation and characterization of a set of policy options. By way of illustration, a first focus of the spatial analysis might be the fleet reduction scenario entailed in the analysis by Pete Leipzig and Richard Young of the Fishermen's Marketing Association's survey of the trawl fleet. Using their and others' stratification schemes of the fleet by vessel size, gear type, license types and target species, we can detail the effects of policy options and measures not only specific to these size etc. classes, but also specific to their area of operation, home ports, or area where most of their landings end up being processed. The goal is to connect the geography of fishing effort to the geography of the fish resource, as well as to the geography of down-stream factors, especially in coastal communities.

Timeline and products

The GFR project runs until September 2002. Initial database architecture, data gathering, and testing of the database for stability, coherence and accuracy was completed in the spring of 2001. The project team is currently expanding the database, with a goal of having 90% of primary and secondary data incorporated by the end of December. Starting in October, we are beginning the integration of the relational database with the GIS platform, and mapping out some of the basic relationships between where fish are caught and the distribution of vessels, landings, revenues, and associated variables along the coast. Throughout the winter and spring, we will be iterating between querying the database and conducting spatial analyses, synthesizing our findings in an increasingly more detailed systems model. Intermediary products will be reviewed by the project advisors, as well as in a number of public venues throughout the late spring and summer, with a final report available in time for the September meeting of the PFMC. In addition to the database, products of the GFR project will include analytical decision-support tools such as simulations or scenarios based on the spatial analysis of policy options, a set of policy recommendations and an executive report to the PFMC.

