

**Northwest Fisheries Science Center**  
**Social Science Research Plan**

**U.S. Department of Commerce**  
**National Oceanic and Atmospheric Administration**  
**NOAA Fisheries**  
**Northwest Fisheries Science Center**  
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## **I. Background and Mission**

Social scientists study the human species—our behavior, our institutions, our relations to one another and to the natural world. In the context of fisheries, we seek a better understanding of the human values, actions, communities, and institutions that influence marine and anadromous fish, marine mammals, and other marine species and ecosystems in the Pacific NW. Our research provides data and tools that support NOAA Fisheries and other agencies’ regulatory and management decisions, as well as contributing scientific work and information to the broader research community and the public.

When we set out to manage a fishery or protect an endangered species, we confront an integrated system of humans and other species. Our management actions may seek to enhance the biological status and/or economic performance of the system, but our choices act directly on its human inhabitants. In this way, fisheries policies have both biological and socioeconomic impacts. Acting on the basis of biological information without socioeconomic analysis can result in policies that appear likely to succeed from a biological standpoint, but unforeseen and undesirable socioeconomic consequences may reduce their effectiveness.

Successful management must therefore be knowledgeable of how humans are affected by fishery management policies. What types of values are associated with those policies? How is the quality of human life affected? How are people likely to react and will they even accept the chosen management measures? Answers to these and similar questions requires an understanding of economic incentives, personal and community values, and institutional structures – all elements of social science research.

The laws that govern fisheries and even those that protect endangered species acknowledge the importance of and sometimes even require social science research. For example, under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), fishery management plans must be consistent with a set of national “standards,” including:

National Standard 1: Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry; and

National Standard 8: Conservation and management measures shall, consistent with the conservation requirements of this chapter (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

The Marine Mammal Protection Act (MMPA) in some cases requires that economic and social factors be considered in the regulatory process, and the Endangered Species Act (ESA) requires an economic analysis as part of the process for designating critical habitat. For all fisheries

management regulations, the Regulatory Flexibility Act and Executive Order 12866 require economic and social impact analyses, as does the National Environmental Policy Act (NEPA). Social science research is an integral part of meeting these requirements.

In addition to satisfying these and other regulatory mandates, social science research can inform and improve fisheries management and conservation planning. Research can be used to craft more cost-effective and socially-effective management actions; document cultural ties and traditions of communities linked to marine resources; gauge the magnitude of the benefits generated by fisheries; analyze the economic and social connections between human and ecological systems; and increase our understanding of the multiple-species nature of many fishing activities. In all of these areas, social science research is a valuable adjunct to the natural science research used by NOAA Fisheries, the Pacific Fishery Management Council (PFMC), and other federal, state, and local natural resource agencies, as well as non-governmental entities involved in fishery management and academic institutions.

Developing the capacity for social science research at the NWFSC is critically important and timely for several reasons:

- Allowable harvest levels for many important commercial and recreational fish species have declined over the past decade, precipitating intensified competition for a scarce resource;
- Ongoing recovery planning for salmon and steelhead requires an analysis of the cost of conservation actions;
- Legal mandates call for the consideration of fishing communities in regulatory policy, which necessitates data collection and analysis of those communities; and
- The changing emphasis of fishery management from single species to ecosystem-based fishery management calls for broader types of social science analyses.

This plan is a step toward increasing this capacity. In developing this plan, we have drawn on documents that have addressed NWFSC social science research needs, including PFMC (2000), NWFSC (2001), NMFS (2001), Miller (2001), and NWFSC (2003). We have also consulted social scientists both inside and outside the center. Finally, we have considered broader research documents such as U.S. Commission on Ocean Policy (2004) and NMFS (2004).

Below, we first describe the research methods and tools for social science research at the NWFSC.<sup>1</sup> We then present the two main themes for the NWFSC social science program: commercial and recreational fisheries, and conservation and ecosystem-based fishery management. The fourth section discusses ongoing NWFSC social science projects and priorities for near-term future research. Finally, we describe the current organization of the NWFSC social science program.

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1. The social sciences currently represented in the NWFSC include economics and anthropology, but could expand to include other disciplines such as geography and sociology.

## II. Social Science Research Methods and Tools

Social sciences study human behavior (what people do), characteristics (who people are), and values (what people prefer). They also collect and study both expert and local knowledge. To pursue these studies, social science research focuses on two major tasks fundamental to any science: information collection and analysis. The first task addresses the basic need to support regulatory and management decisions by documenting existing economic and social conditions. The socioeconomic analyses that constitute the second task utilize models that describe or predict how specific regulations and policies affect individuals and communities.

Social science uses two basic approaches to collect information: direct observations and surveys. Direct observation is useful in cases where economic and social values can be inferred directly from behavior or some other observable circumstance. In other cases, these values and other socioeconomic characteristics cannot be observed directly – for example, when the behavior of interest is historic or the values are not expressed directly in some observable behavior. In these and other cases, researchers can gather information by using surveys or secondary sources.

Social science research for fisheries management and conservation collects information in several areas: the economic performance and value of commercial and recreational fisheries; the value and services provided by protected species and ecosystems; sociocultural profiles of fishing communities; the costs and effectiveness of management and recovery actions; and local knowledge bases, systems, and uses of that knowledge. The information gathered in these and other areas include both quantitative data (for example, costs and earnings of commercial fishermen or demographic characteristics of fishing communities) and qualitative information (for example, beliefs and perceptions regarding marine resources). Both types of information can be incorporated into social science analyses.

Crafting effective and equitable fishery policies requires an understanding of how humans are likely to perceive and respond to those policies. Social scientists address this by building descriptive and predictive models of how humans interact with the natural environment and with one another. These models can be focused on individuals who participate in or are associated with fisheries. They can also assess social and economic networks at a community, regional, or market level.

Descriptive models characterize and categorize socioeconomic information, often to facilitate evaluations of management policy impacts. Under National Standard 8 of the MSA, for example, social scientists seek to categorize fishing communities in terms of the extent to which they are “dependent” or “engaged” in the “harvest or processing of fishery resources to meet social and economic needs.” This and other ways of organizing information allow decision makers to identify impacts of fishery management policies on these communities and judge their potential magnitudes. Economic models of recreational fishing are another example. These models can be used to estimate the economic value of fishing activities that take place outside a market setting.

Developing and utilizing predictive models is another part of social science research. In economics, models predict how changes in incentives and constraints are likely to produce changes in “fishing behavior” - that is, how individual fishermen, vessels, processors, and so forth will change the level, location, and timing of their effort, selection of gear, and other aspects of fishing activity. Predictive models can also be used to develop hypotheses about regional changes in income and employment that are likely to result from fishery management policies. Other social science models provide a means for assessing and predicting potential conflicts and congruencies between policy methods and sociocultural values, norms, and beliefs. Analyses of the capacity of certain forms of social institutions to manage natural resources can similarly predict the potential strengths and weaknesses of particular fishery management policies.

The divisions between these types of tasks are not always precise, of course. Many social science projects collect data in the course of building models and conducting analyses. Similarly, a model can have both descriptive and predictive characteristics. Nevertheless, the divisions are useful because many projects fall into one category or another, or have elements that are identifiable in this way.

### **III. NWFSC Social Science Research Themes**

Social science research at the NWFSC is organized around two broad themes: commercial and recreational fisheries, and *in situ* (“in place”) conservation and ecosystem management. The first theme captures the classic focus of NOAA Fisheries social science in conducting research that also provides support for the management actions of the regional fishery management councils. This theme covers information collection and analysis for the economic performance and valuation of fisheries, and the economic and social impacts of management practices under laws such as the MSA. The agency’s mission has broadened under laws such as the Endangered Species Act and the Marine Mammal Protection Act, and so the second theme covers social science research for the conservation and management of species and ecosystems. Social science research informs efforts to craft effective programs to conserve species *in situ*, focused on protecting them in their natural habitats rather than their eventual harvest. It can also complement biological research that supports ecosystem management.

#### Commercial & Recreational Fisheries

NOAA Fisheries, in part through the NWFSC, provides support for the Pacific Fisheries Management Council (PFMC), which is responsible for crafting management policies for marine fisheries off the coasts of California, Oregon, and Washington. The PFMC is responsible for assessing the social and economic impacts of its policies, creating a strong demand for social science research on those fisheries. Although the PFMC’s own Stock Assessment and Fishery Evaluation (SAFE) report describes many socioeconomic dimensions of these fisheries, there is still a need for more detailed data collection and analysis to enhance the SAFE reports and support other PFMC actions. Social science research on fisheries is also useful for evaluating the incentive effects of

regulations, the consequences of altering industry structure and community cohesion, the impacts of changes in the spatial distribution of fishing, and so forth.

A major component of this first theme is research on the economic performance and behavior of commercial fisheries. With data on costs and earnings, economists can develop key economic performance measures such as profitability, capacity utilization, efficiency, and productivity. The PFMC and other agencies can use these measures to assess economic impacts and satisfy regulatory requirements (such as performing cost benefit analysis under Executive Order 12866 and considering small entity impacts under the Regulatory Flexibility Act) during the consideration of management policies such as buyback programs and individual transferable quotas (ITQs). Although they are more complex, spatial models of fishing behavior address the important questions of how fishing effort is distributed over space and how it changes when economic values or regulatory and other constraints change. These models can be used to analyze the economic impacts of establishing marine protected areas and other spatially-oriented management programs.

Research on the economic value of recreational fishing is another major component of the first theme. Recreational fishing takes place in both a market and a non-market setting. For charter boats (or fishing with hired guides), recreational fishing is similar to commercial fishing in one respect but different in another. The charter boat itself (that is, its owner and crew) is engaged in a commercial, market enterprise. Gathering social science data on charter operations supports analyses equivalent to those conducted for commercial fisheries. Because the charter market is for a fishing experience as well as the fish itself, however, there is also a non-market component. Each fish caught during a charter experience has a “zero price,” so to speak. For this reason, the value of changes in recreational harvest limits, for example, cannot be deduced directly from data on the costs and earnings of charter operations. Additional data on the fisherman themselves is needed.

Fishing that takes place entirely outside a market setting poses a similar challenge for the social scientist. For this type of fishing, individuals incur “fixed” costs for equipment and a license, as well as “variable” costs such as travel expenses and bait. These expenses, however, are not an accurate estimate of the economic value of the fishing experience. Instead, economists use the concept of “willingness-to-pay” (WTP) as one measure of the benefit of the fishing experience. WTP expresses the willingness of a fisherman to trade off various characteristics of the experience, including the ability to fish at all, with the “cost” of the experience measured in monetary terms. Using data gathered from surveys of either actual or hypothetical behavior, economic analysis can estimate the WTP for recreational fishing and explore how different characteristics of the fisherman and the fishing experience affect WTP. These results can be combined with the costs of recreational fishing to build behavioral models of fishing participation. These models can then be used to analyze the economic value of different characteristics of a recreational fishing experience (e.g., catch rate, species) and constraints on that experience (e.g., bag and size limits, seasonal and area closures), as well as changes in the levels of those characteristics and constraints.

A final component is non-economic research on fishing communities and activity, which includes commercial but can also span recreational and subsistence fishing. Detailed sociocultural

information on fishing communities is needed to satisfy a variety of regulatory requirements under laws such as the MSA and NEPA. One of the first challenges is to determine which communities satisfy the definition of “fishing community” found in the MSA. Community profiles are produced for communities that may ultimately be defined as MSA fishing communities, and include information on labor and business characteristics, demographics, community and institutional structures, and fishing-related organizations, programs, and services. Fisheries data organized for and used in the community profiles enable researchers to develop quantitative methodologies that categorize communities as MSA fishing communities. Both these data and information on the other community features described, gathered on the community level as well as on groups within the community, are then used to assess the impacts of proposed management and conservation actions.

### *In situ* Conservation of Protected Species and Ecosystems

Natural resources like fisheries have recognized values that come from maintaining the resource in its natural habitat. Similarly, ecosystems have value in their natural state and functions, and sometimes as a potential source of goods and services. These economic and social values often accrue outside a commercial or even a recreational setting, and so management goals may primarily or solely focus on conservation of the species or ecosystem *in situ* (“in place,” or in its natural habitat or setting).

Under the ESA and the MMPA, NOAA Fisheries is charged with listing and protecting species threatened with extinction or biological depletion. These species include 26 evolutionarily significant units of Pacific salmon and steelhead listed under the ESA as either endangered or threatened, and populations of cetaceans (*e.g.*, killer whales) and pinnipeds (*e.g.*, California sea lions and harbor seals) protected under the MMPA. Although biological data provide the sole foundation for the initial decision to protect these species, both laws mandate the consideration of socioeconomic factors at other points. The designation of critical habitat under the ESA requires an analysis of the economic and other impacts of the designation, and recovery plans for ESA-listed species must account for the costs of the recovery actions. The MMPA calls for “economic and technological feasibility” to be taken into account when prescribing conservation regulations.

In addition, social science research provides useful information and tools for the more general problems of conservation planning and ecosystem management. For conservation efforts aimed at protecting individual species, a social science perspective acknowledges that those efforts take place in an environment dominated by humans. Documenting the social and economic characteristics of the environment is an important part of crafting practicable conservation strategies. Social science research can also be integrated with biological research that supports conservation efforts. For example, combining biological data on the effectiveness of conservation actions with economic and social data on the costs and other impacts of those actions enables recovery and conservation planners to identify more cost-effective and socially-effective policies. By considering the “bang for the buck” of individual actions, priorities can be set among individual actions and across broad types of actions.



Another useful avenue for research focuses on the human institutions – local governments, stakeholder groups, and so forth – that will be the actual instruments for species conservation. In an “unregulated” state, species populations have characteristics of a common property resource, which is often cited as the basis for government intervention and regulation. Social science research has shown, however, that this “tragedy of the commons” perspective is too simplistic. Where a common property resource exists, one often finds institutions that govern access to and the use of the resource, often outside a formal regulatory environment. Many of these institutions have succeeded in husbanding the resource, and social science research has shown that they share a common set of characteristics. This research provides a framework both for assessing the likely success of conservation if undertaken by a given set of institutions, and for designing or modifying institutions to improve the chances of successful conservation.

Although the focus of NOAA Fisheries regulatory authority is on individual species, ecosystems have received increasing interest, both from within the agency and through Congressional directives. The MSA requires the fishery councils to amend Fishery Management Plans by describing and identifying “essential fish habitat” areas, or areas necessary for spawning, breeding, feeding, and rearing. For commercial and recreational fisheries, the agency is developing guidelines for ecosystem management plans, which would complement the fishery management plans developed by fishery management councils. These ecosystem plans would provide scientific data and analyses to the councils, enabling them to consider the impacts of management actions that cut across individual species.

As is the case for protected species, social science research can be a valuable adjunct to biological research on ecosystems. Ecosystems generate a wealth of valuable goods and services, and provide a rich source of social and cultural interactions with the natural world. Social science research can identify these goods, services, and interactions, and where possible (and appropriate), quantify them.

Assessing the values of ecosystems should not overlook an important fact: Humans are a natural, integral component of those systems. Economic, social, and cultural ecosystem values come not just from distant appreciation but also from active interaction with species and other ecological components. Documenting and characterizing these interactions allows management to account for the impacts that may result from changes in the status of an ecosystem. Social science research can also provide additional information on the nature and extent of the ecosystems themselves. Human interaction with natural systems generates local knowledge about the species and ecological processes that comprise these systems. Documenting this knowledge complements information gathered through the natural sciences to provide a complete picture of the integrated system.

#### **IV. NWFSC Social Science Organization**

Currently, the NWFSC social science program is divided into two groups. The first is located within the Fisheries Resource Analysis and Monitoring (FRAM) Division, and is focused on groundfish economic issues. This group includes three economists. The second group is under the Science

Director (SD). This group is focused on salmon and other non-groundfish economic issues as well as sociocultural issues regardless of species, and includes an economist and two non-economic social scientists. Figure 1 shows the locations of these groups in the NWFSC's overall organization.

Part of the challenge of the next several years will be deciding where future growth will occur and how future research funding will be divided between the two groups.<sup>2</sup> The division into two groups is not an obstacle given the current small size of the program. If the program grows, however, the issues of how the program should be organized and where it should be located will become more pressing.

## **V. NWFSC Ongoing Projects and Research Priorities**

Because of the program's small size, current social science research at the NWFSC has responded to funding opportunities with a particular research focus rather than following a broad plan. Recently completed and ongoing research projects include the following:

### **Commercial and Recreational Fisheries**

- Commercial Fisheries Economic Data Collection Program (FRAM)
  - Economic data collection for groundfish and closely related (*e.g.*, crab and shrimp) fleets
  - Institutional innovations for groundfish management
  - Economic analysis of capacity reduction in West Coast groundfish fishery
  - Economic impacts of groundfish regulations in Pacific region
  - Bioeconomic model to assess West Coast groundfish harvest
- Recreational Fisheries Economics Program (FRAM)
  - Washington and Oregon marine recreational fishing valuation project
  - California marine recreational fishing valuation project
- National Standard 8 Research Projects (SD)
  - Socioeconomic dimensions of directed open access Pacific groundfish fishery
  - Fishing community profiles in the Western states (jointly conducted with Alaska Fisheries Science Center)
  - Subsistence fishing baseline data collection and organization

### ***In situ* Conservation of Protected Species and Ecosystems**

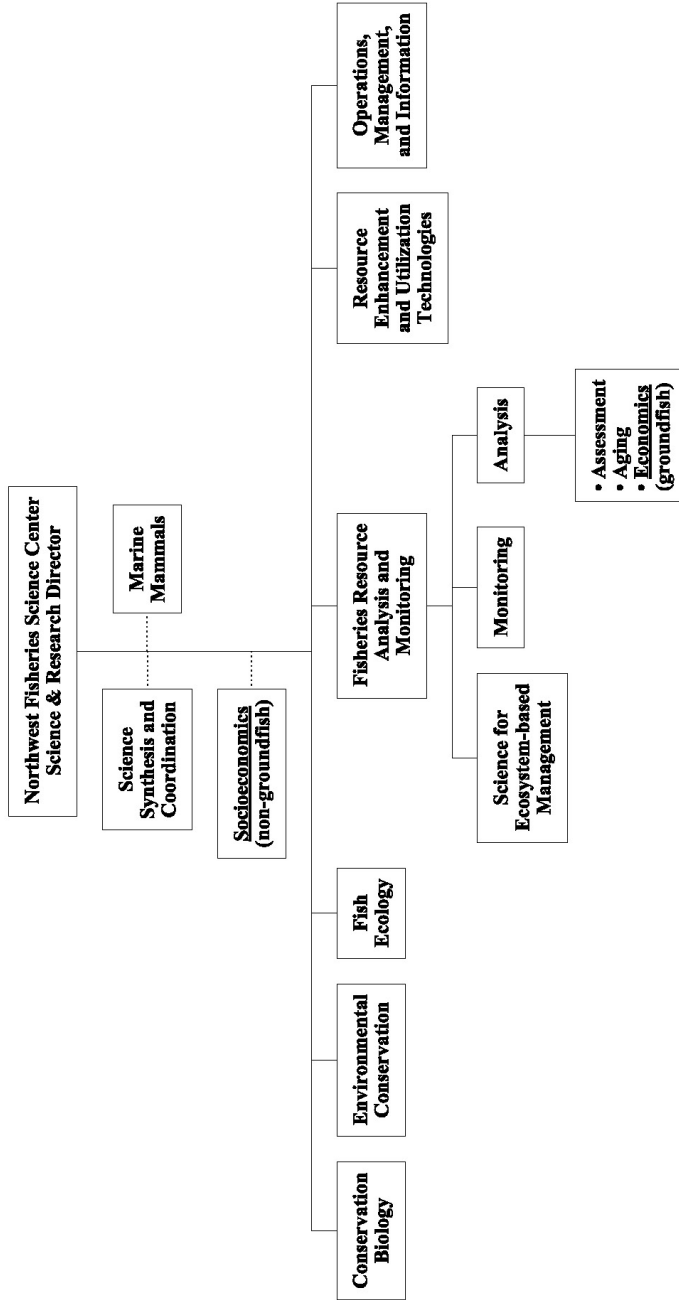
- Economic impacts of critical habitat designation (SD)
- Ecosystem values for Pacific salmon and steelhead (SD)
- Conservation banking for salmon and steelhead habitat (SD)

For the near-term, research priorities will continue to focus on basic socioeconomic information collection and strengthening the NWFSC social science program by broadening its capacity to conduct social science analyses. Specific areas we have identified as priorities include the following:

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2. The NWFSC may receive funding for one or two additional social scientists to begin in FY2006.

Figure 1  
Social Science Groups at the NWFSC



### Commercial and Recreational Fisheries

Priority: Provide socioeconomic information to fisheries managers and the public by conducting research in four areas:

- Commercial fisheries economic data collection and analyses covering the Pacific groundfish and salmon fleets under the jurisdiction of the PFMC
- Recreational fisheries economic data collection and analysis covering marine recreational fishing
- Regional economic impact analyses of commercial and recreational fisheries
- Community profiles, demographics, local knowledge bases, and other socioeconomic information collection to support social impact analyses, environmental justice analyses, and analyses of community impacts of ITQs

### In situ Conservation of Protected Species and Ecosystems

Priority: Facilitate cost-effective strategies for protected species conservation and ecosystem management by conducting research in four areas:

- Economic data collection and analyses for recovery planning under the ESA for Pacific salmon and steelhead
- Estimation and analyses of non-use values of protected species
- Social and economic information collection on Pacific Northwest marine mammal interactions with humans
- Information collection and analyses of the social and economic impacts of harmful algal blooms (in conjunction with the NWFSC Oceans and Human Health Initiative)

Table 1 describes and gives approximate funding levels for potential research projects that address these research priorities.<sup>3</sup>

Priority will also be given to integrating social science research at the NWFSC with research both within the community of related federal agencies and outside in the broader academic environment. The PFMC, for example, is also supported by research conducted by NOAA Fisheries' Southwest Fisheries Science Center, and so coordination with that center should be a priority. Outside the federal government, the NWFSC has opportunities to join with Oregon State University and the University of Washington in areas such as graduate internships and joint research programs. Attention should therefore be given to improving the working relations between the NWFSC and these universities.

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3. In some cases, funding levels are determined by existing programs that support social science research within NOAA Fisheries. For example, the NWFSC currently receives \$200 thousand annually to collect commercial fisheries economic data.

**Table 1**  
**NWFSC Social Science Research Projects, Five Year Outlook**

<b>Project</b>	<b>FMP*</b>	<b>FY06</b>	<b>FY07</b>	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>
<b>Commercial and Recreational Fisheries Projects</b>						
Groundfish cost-earnings data collection - 3 yr rotational survey	GF	\$200	\$200	\$200	\$200	\$200
	The limited entry fleet surveys will be in person, all other surveys will be a combination of telephone and mail. The sample universe will consist of 224 limited entry trawl, 167 limited entry fixed gear, 1,118 open access groundfish, 626 crab and shrimp vessels.					
Salmon trawl/gillnet cost-earnings data collection	S		\$150			\$150
	This project will collect data comparable to the commercial groundfish cost-earnings surveys. The sample frame will consist of 561 vessels.					
Aquaculture	S				\$200	
	This project will document the status of aquaculture in the Pacific NW.					
Vessel Monitoring System (VMS) data analysis	GF	\$50				
	This project will combine VMS data with fuel use and purchase data to estimate fuel cost per trip/hour in the commercial groundfish fishery. The estimates can be used for by-catch modeling, behavioral models, and other commercial fisheries models.					
ITQ participation modeling	GF	\$100				
	This project will use a stated preference framework to collect data to model the likelihood of ITQ participation; test the data quality and model accuracy relative to actual participation; and determine the feasibility of this approach for use with other fisheries. The project results can be used to estimate the economic and community impacts of ITQ's before program implementation. The sample frame would be the limited entry trawl, groundfish fleet.					
Market supply/demand analysis	GF				\$100	
	This project will obtain data from export markets and processors in order to estimate market supply and demand models for west coast groundfish.					
Spatial modeling	GF		\$100			\$200
	This project will collect additional data on set location and set time to make the fixed gear, groundfish fleet data comparable to the trawl, groundfish fleet data set. It will also collect species-specific data on variable cost to facilitate spatial modeling, and collect more detailed cost-earnings information for particular ports or vessel groups.					

**Table 1**  
**NWFSC Social Science Research Projects, Five Year Outlook**

<b>Project</b>	<b>FMP*</b>	<b>FY06</b>	<b>FY07</b>	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>
Groundfish and salmon marine recreational fishing valuation survey for WA & OR	GF & S			\$300		
	This is a stated preference survey to value fishing trips, species catch and various regulations. The project is funded for 2004/05 with a sample size of 8,000 anglers in WA and OR.					
Charter cost-earnings data collection	GF & S	\$150			\$150	
	This project is a cost earnings survey of charter operators in WA and OR. It will update the data collected in 2000 and be used to inform input/output models as well.					
Data to model participation rates in recreational fisheries	GF & S		\$100			\$100
	This project will collect data using a contingent behavior survey to allow for the estimation of more localized participation estimates, including substitution across sites.					
Freshwater salmon and steelhead recreational valuation	S		\$200			\$200
	This project will estimate recreational fishing values for Pacific NW salmon and steelhead in freshwater. Through their status as protected species under the ESA, NOAA Fisheries consults with state fisheries agencies on their harvest regulations. These data will improve the assessment of the impacts of these regulations.					
Regional impact analysis	GF & S	\$200		\$150		\$100
	This project will collect data to estimate regional impact modeling coefficients. We will use the data to estimate the effect of ITQ's and other regulatory changes on communities					
Community profiling	GF & S	\$75	\$50	\$50	\$50	\$50
	This project gathers and analyzes data linking communities of the U.S. west coast to "dependence" upon fishing activities in general, or "engagement" in harvest from particular fisheries, the need for which is described in the MSFCMA's National Standard 8. Short form profiles of a list of these communities, generated from Data Envelopment Analysis (DEA) models, will be produced. Later phases involve regionally representative long form profiles of fishing communities, based upon short-term ethnographic data collection, and new analyses based upon continually updated fisheries and census data.					

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**NWFSC Social Science Research Projects, Five Year Outlook**

<b>Project</b>	<b>FMP*</b>	<b>FY06</b>	<b>FY07</b>	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>
Environmental Justice	GF & S			\$25		
	This project will provide information on minority, immigrant and relatively poor (i.e. "environmental justice") that are potentially impacted by changes in fisheries regulations and stocks. The first phase will be an examination of existing data and literature to link areas of fishing activity and points of entry into the fishery with specific communities. The second phase will focus on ethnographic data collection among these communities in order to qualitatively and quantitatively characterize them.					
ITQ community impacts	GF & S				\$25	
	This project seeks to use existing data and in-community field research to examine how communities will be transformed by the implementation of an ITQ system. In this project, communities engaged in fisheries subject to proposed ITQ systems will be examined and potential impacts predicted and described.					
Subsistence communities	GF & S		\$50			\$50
	This project will gather baseline data on the subsistence harvest of fish and shellfish, in both tribal and non-tribal settings, using (initially) existing data sources. These data will be updated in a second phase through small-scale ethnographic field research of geographical areas of importance to the subsistence harvest					

**Table 1**  
**NWFSC Social Science Research Projects, Five Year Outlook**

<b>Project</b>	<b>FMP*</b>	<b>FY06</b>	<b>FY07</b>	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>
<b><i>In situ</i> Conservation Projects</b>						
Cost-effectiveness of salmon recovery actions	S	\$100			\$100	
	This project will gather data on the costs of recovery actions for Pacific NW salmon and steelhead ESUs. The recovery actions include harvest reductions, hatchery reforms, modifications to hydropower facilities and operations, and habitat restoration and protection. The data will be used to facilitate recovery planning and incorporated in recovery plan documents.					
Freshwater ecosystem services	S	\$25			\$25	
	This project will gather data to document (where possible) ecosystem services (market and non-market) provided by salmon and steelhead freshwater habitat. The emphasis will be on the marginal values of changes in the services produced by the restoration and protection of habitat					
Costs and benefits of ecosystem protection measure	GF & S		\$100	\$200		
	This project will collect economic data and relevant biological/ecological data to estimate economic models of ecosystem protection. The results may also be applicable to spatial modeling data collection projects.					
Impacts and cooperation of institutions in salmon habitat restoration and protection	GF & S		\$50	\$50	\$100	\$100
	This project will focus on the mapping of areas in a region of importance to specific salmon populations, Washington state's Puget Sound. In order to examine how different institutional structures, including private ownership, national parks, federally managed lands and tribal governance, have played a role in habitat quality, GIS tools will be used to coordinate mapping between salmon habitat quality variables and past management structures for the same areas. Latter phases will examine and predict how differing institutions in key habitat areas may cooperate or not for salmon habitat restoration, based upon social networks analyses and analysis of salmon habitat as a common pool resource.					
Non-use values of salmon	S				\$200	
	This project will supplement and update the national protected species survey work by NOAA Fisheries on non-use values for Pacific NW salmon and steelhead. The project will focus on individual salmon and steelhead ESUs and attempt to disaggregate general species-level values into ESU-specific components.					



**Table 1**  
**NWFSC Social Science Research Projects, Five Year Outlook**

<b>Project</b>	<b>FMP*</b>	<b>FY06</b>	<b>FY07</b>	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>
Marine mammal social science research		\$50		\$25		
	This project will use existing data and field research to describe the socio-economic significance of marine mammals to northwest communities. In particular, the project will focus on tourism and the marine mammal viewing industry, describing this industry and its operations. Data will be collected in order to quantitatively characterize the industry's clientele and their marine mammal viewing experiences and expectations. The two data collection efforts, on the industry and its clientele, will allow for predictions about impacts on both the industry and its communities, and will also indicate how shifts in operations might arise in response to any future regulation of vessel interaction with marine mammals.					
Harmful algal blooms	S	\$25	\$25			
	This project will gather socioeconomic data on the shellfish fisheries of Washington State and the impacts of harmful algal blooms on those fisheries. The research can be used to assess the gains from improved forecasting abilities for shellfish closures brought on by harmful algal blooms.					

\*Fisheries Management Plan(s) addressed by project (GF = groundfish; S = salmon)

## **VI. References**

Miller, Marc L., 2001. Human Dimensions Group (HDG): Living Marine Resource and Environmental Management Programs, manuscript.

National Marine Fisheries Service (NMFS), 2001. Development of Plan for a Social Science Program in NMFS, Memorandum from William Stelle, Jr., and Usha Varanasi to William Fox, July 30, 2001.

NMFS, 2004. NMFS Strategic Plan for Fisheries Research. U.S. Department of Commerce, NOAA Technical Memorandum NMFS F/SPO-61.

Northwest Fisheries Science Center (NWFS), 2001. A Groundfish Socio-economics Action Plan for the Northwest Fisheries Science Center, August 15, 2001.

NWFS, 2003. A Salmon Research Plan Volume I: the Questions and Constraints, and A Salmon Research Plan Volume II: Implementing the Research Required to Answer the Ten Key Questions.

Pacific Fisheries Management Council (PFMC), 2000. West Coast Fisheries Economic Data Plan, 2000-2002.

U.S. Commission on Ocean Policy, 2004. An Ocean Blueprint for the 21st Century Final Report of the U.S. Commission on Ocean Policy.