

**NOAA Fisheries Service
National Cooperative Research Program**

FY 2007 Funded Projects

Table of Contents

Program Objective	4
Funding History	4
OFFICE OF SCIENCE AND TECHNOLOGY	5
Project Title: National Cooperative Research Coordination and Outreach	5
PACIFIC ISLANDS COOPERATIVE RESEARCH	6
Project Title: Northwestern Hawaiian Islands Lobster Tagging Program	6
ALASKA FISHERIES SCIENCE CENTER COOPERATIVE RESEARCH	7
Project Title: Bering Sea Fisheries Research Foundation Cooperative Research	7
Project Title: Aleutian Islands Cooperative Acoustic Survey Study (AICASS)	8
Project Title: Fishing Technology and Conservation Engineering to Reduce Bycatch and Damage to Seafloor Animals	9
Project Title: Sablefish Logbook Program	10
Project Title: Atka Mackerel Tag Recovery in the Aleutian Islands	11
NORTHWEST FISHERIES SCIENCE CENTER COOPERATIVE RESEARCH	12
Project Title: Personnel and Associated Management Costs	12
Project Title: Development of Cooperative NOAA Fisheries Service/Industry Surveys	12
Project Title: Continuation of the Port Liason Project Using Fishers Knowledge to Add Value to Research, an OAR/NOAA Fisheries Service Collaboration	12
SOUTHEAST FISHERIES SCIENCE CENTER COOPERATIVE RESEARCH	14
Project Title: Supplementation of the Southeast Cooperative Research Program	14

NORTHEAST FISHERIES SCIENCE CENTER COOPERATIVE RESEARCH	166
Project Title: Oversight and Outreach Activities to Support RSA Programs and Integration of those Activities with the Northeast CRPP	16
Project Title: Study Fleet Phase III Implementation, Monitoring, and Analysis	16
Project Title: Equipment and Operating Costs to Support Cooperative Research Projects	17
NORTHEAST REGIONAL OFFICE COOPERATIVE RESEARCH	19
Project Title: Activities to Support Exempted Fishing, NEPA, and Other Associated Consistency Reviews for the Northeast CRPP	18
SOUTHWEST FISHERIES SCIENCE CENTER COOPERATIVE RESEARCH	19
Project Title: Cooperative Albacore Archival Tagging Program	19
Project Title: Cooperative Rockfish Surveys Using Advanced Sampling Technologies Archival Tagging Program	20
Project Title: Cooperative Large Pelagics and Endangered Species Surveys	21

Program Objective

This NOAA Fisheries Service Cooperative Research Program is structured on regionally identified cooperative research priorities and relates to internal and external reviews. Internal reviews include *Managing the Nation's Bycatch* (1998); *NOAA Fisheries Data Acquisition Plan* (1998); *Marine Fisheries Stock Assessment Improvement Plan* (2001); and *Strategic Plan for Fisheries Research* (2004). External reviews include the Kammer Report (2000) and three National Research Council Reports—*Improve Fish Stock Assessments* (1998), *Effects of Trawling & Dredging on Sea Floor Habitat* (2002), and *Cooperative Research in the National Marine Fisheries Service* (2004)). NOAA Fisheries Service proposes a continuation of strategic investments in augmenting fishery stock assessment and the general collection of data through cooperative research, including additional charter vessel days-at-sea, development of gear modifications and fishing practices to reduce bycatch, study of the effects of fishing gear on sea floor habitats, and identification of essential fish habitat (EFH). All allocations are routed through the appropriate Regional Fisheries Science Center.

AOP Elements

Objective 2: Recover Protected Species

Objective 3: Rebuild and Maintain Sustainable Fisheries

External Recipients

A broad range of external recipients are identified in this spending plan, including fishery constituencies in every region across the country as well as state, private, and university participants.

Funding History

FY 2001 = \$2,993,000.00

FY 2002 = \$2,750,000.00

FY 2003 = \$1,043,000.00

FY 2004 = \$2,626,000.00

FY 2005 = \$2,710,306.00

FY 2006 = \$2,712,000.00

FY 2007 = \$2,710,000.00

Office of Science and Technology

Project Title: National Cooperative Research Coordination and Outreach

Overview: The Office of Science and Technology will support a full-time National Cooperative Research Coordinator to work closely with the NOAA Fisheries Service regional cooperative research programs to improve communication and enhance the scientific quality of cooperative research results for use in stock assessment and fisheries management. The national program will be supported by the Cooperative Research Working Group, which will provide input and recommendations in the development of annual budgets for the NCRP, develop strategies for outreach and education, and develop national guidelines to improve consistency.

The National Cooperative Research Coordinator will provide support for the following objectives:

- (1) Provide a forum to coordinate regional cooperative research programs.
- (2) Develop national guidelines to enhance regional cooperative research programs and improve consistency, where possible.
- (3) Assist the NOAA Fisheries Service regional cooperative research programs in addressing issues of regional and/or national concern.
- (4) Facilitate the compilation and communication of information on cooperative research activities to fisheries scientists, managers, fishermen, the fishing industry, and the general public.
- (5) Enhance the use of cooperative research results in stock assessment and fisheries management decision-making.
- (6) Provide national awareness of the successes of cooperative research activities to Congressional and constituent groups.
- (7) Conduct national outreach activities to showcase the benefits of cooperative research.

Research Description: The National Cooperative Research Coordinator, in coordination with the Cooperative Research Working Group, will conduct the following activities during FY 2007:

- Facilitate the timely distribution of national funds to enhance implementation of cooperative research activities in all regions.
- Begin planning an annual national cooperative research workshop for FY 2008.
- Develop an annual compilation of cooperative research activities to be published in FY 2008.
- Coordinate analysis of the developing draft legislation to reauthorize the Magnuson-Stevens Act.
- Respond to Congressional and constituent inquiries regarding agency cooperative research activities.
- Provide support to the NOAA Fisheries Service regional cooperative research programs on specific issues of relevance.

- Coordinate input on national initiatives to ensure cooperative research issues and concerns are addressed (e.g., exempted fishing permits, electronic reporting, and peer review).

Pacific Islands Region Cooperative Research Program

Project Title: Northwestern Hawaiian Islands Lobster Tagging Program

Overview: The FY 2007 Pacific Islands Region programmatic funding from the National Cooperative Research Program will be used to support the Northwestern Hawaiian Islands (NWHI) lobster tagging program. This ongoing cooperative research project uses chartered commercial fishing vessels as scientific platforms for the tagging and releasing of spiny and slipper lobsters. The scientific objectives of the tagging program are to:

- (1) Collect essential life history and distributional data for spiny lobster and slipper lobster.
- (2) Continue the lobster tagging experiment to advance the development of population dynamics models.
- (3) Document habitat degradation and associated bycatch (vertebrates and invertebrates) stemming from lobster fishing in the NWHI.
- (4) Provide marine vertebrate and invertebrate samples for fatty acid analyses to elucidate trophic linkages and dependencies in monk seals.

The use of chartered commercial fishing vessels is pivotal to the success of this program, as the annual research survey aboard the NOAA research vessel *Oscar Sette* lacks sufficient fishing effort to provide adequate tag recoveries for parameter estimation (as well as samples for tagging).

Lobster biological data and population dynamics models from the 1980s form the basis of present assessments of lobster stocks in the NWHI. Lobster populations in the NWHI have undergone significant changes in abundance and distribution since then, and recent hypotheses suggest that fluctuations in monk seal populations in the NWHI may be linked to population fluctuations of lobsters. During a technical review of the NWHI lobster assessment models it was recommended that collaborative research programs between industry and the Pacific Islands Fishery Science Center (PIFSC) be developed to provide independent estimates of population size and updated estimates of population dynamics.

In response to these recommendations the PIFSC lobster research team—with wide support from industry and the Western Pacific Regional Fishery Management Council—implemented a collaborative lobster tagging program. A series of lobster tagging and recapture cruises, using both research and chartered commercial fishing vessels, have already occurred in the NWHI, and additional cruises (research and charter) are required to complete the studies and to recapture animals tagged on previous cruises. The initial cruises provided some data on habitat degradation and bycatch levels stemming from commercial lobster fishing operations in the NWHI, and preliminary samples for fatty

acid analyses. Additional data and samples are required to assess fishery impacts on the environment and on trophic interactions.

Research Description: Two commercial fishing vessels are chartered for 30 sea-days each between June and August to conduct lobster tagging research at four banks in the NWHI—Necker Island, Maro Reef, Gardner Pinnacles, and Laysan Island. One vessel is assigned to Necker Island and Gardner Pinnacles, the other to Maro Reef and Laysan Island. Sampling sites are selected using a stratified random design and site locations are provided to each captain prior to departure. Each vessel sets 15 strings of 20 traps daily, one string per sampling site. Traps are baited with approximately 2 pounds of mackerel and fished overnight. A standardized protocol is followed for the handling of lobsters and biological data for each lobster is collected—e.g., species, carapace length, sex, reproductive condition, and tag number. Location data (latitude and longitude) of caught and released lobsters are also collected at the string level. All lobster and bycatch are released on the bottom using a tethered release cage device.

Alaska Fisheries Science Center Cooperative Research

Project Title: Bering Sea Fisheries Research Foundation

Overview: Management of the Alaskan crab fisheries in the eastern Bering Sea is undertaken jointly by the Alaska Board of Fisheries and the North Pacific Fishery Management Council. Implementation of the management is the responsibility of the Alaska Department of Fish and Game in consultation with NOAA Fisheries Service. Scientists from AFSC are responsible for conducting the annual eastern Bering Sea bottom trawl survey and research to estimate various population parameters (e.g., growth, mortality, recruitment, and reproductive potential), which are then used to estimate the abundance of juvenile, mature female, and legal male crab stocks and the productivity of the stock for modeling purposes in deriving annual harvest levels consistent with sustainability goals. Representatives from the Alaska crab industry have formed a non-profit Bering Sea Fisheries Research Foundation (BSFRF) to support cooperative research with NOAA Fisheries Service to improve the database for managing Bering Sea crab resources. The goal for 2007 is for the BSFRF and the AFSC to establish a third Memorandum of Agreement for summer 2007 and to engage in cooperative joint research projects of mutual interest where costs will be shared equitably.

Research Description: In consultation with AFSC scientists, the BSFRF Board of Directors has identified research projects to address the uncertainty of the crab assessment to improve management models for the tradition crab resource in the eastern Bering Sea. Because many of these crab stocks are near or below B_{msy} , the rate of exploitation is set at a conservative level to encourage further rebuilding. Given the relative uncertainty in the estimates of resource productivity and acceptable levels of harvest, scientists from NOAA and the Board of BSFRF agree that the 2007 summer research project will conduct a crab-specific survey using the Canadian survey scheme evaluated in 2005 and directed at Bristol Bay red king crab. The BSFRF and the AFSC submitted a proposal to the North Pacific Research Board in 2006 to fund part of the

survey costs. The AFSC's contribution to the project was proposed to cover the cost of charter vessel fuel and to provide standard sampling gear and supplies, as well as participation by an AFSC scientist in the survey. The BSFRF will charter a fishing vessel in 2007 for 40 to 60 days to conduct the cooperative research effort. BSFRF will take the lead in planning the cruise, provide the scientific lead for the survey, and perform analysis and reporting of the survey results with funds the BSFRF received from the NPRB and funds the BSFRF raised from the industry as their contribution to the 2007 BSFRF/AFSC cooperative research program. AFSC will assist in staffing the cruise; build, certify, and maintain sampling gear; and provide fuel and sampling supplies for the vessel. AFSC will also review the data, analysis, and draft reports of the results, and will drive the preparation of the updated Memorandum of Agreement.

Project Title: Aleutian Islands Cooperative Acoustic Survey Study (AICASS)

Overview: The goals of this study are to assess the abundance and spatial dynamics of Alaska pollock (*Theragra chalcogramma*) in the central Aleutian Islands through acoustic surveys. The 2007 study is expected to be the first of three such studies planned by the Aleut Corporation through 2009 to assess the technical feasibility of managing pollock harvest within Steller sea lion (SSL) critical habitat at smaller spatial and temporal scales, and the development of a winter time series of abundance for Central Aleutian Islands pollock. The directed Aleutian Islands pollock fishery was closed in 1999 in part because of concerns for the health of the Steller sea lion (*Eumetopias jubatus*) (SSL). In 2003 the entire Aleutian Islands-directed pollock quota was allocated to the Aleut Corporation by Congressional mandate. There is little information on the abundance or distribution of pollock in the Aleutian Islands in winter, when a fishery is expected to be carried out. There is therefore little information for assessing the appropriateness of management strategies that impact this fishery and that are intended to mitigate possible impacts to the endangered Steller sea lion. NOAA Fisheries Service resources to conduct acoustic surveys are limited, and using fishing vessels to conduct surveys of the Aleutian Islands winter pollock may be a viable long-term alternative to monitor stock status and trend.

Using fishing vessels to collect scientific data for management purposes is a growing trend worldwide (Barbeaux et al. 2005; O'Driscoll and Macaulay 2005; Stanley et al. 2000). In February through April 2006, the first Aleutian Islands Cooperative Acoustic Survey Study (AICASS) was conducted to assess the feasibility of using a small (<35 m) commercial fishing vessel to acoustically estimate the abundance of pollock in waters off the central Aleutian Islands (Barbeaux 2006). The study was envisioned as a first step in exploring the technical feasibility of using acoustics as a tool to foster cooperative and adaptive management of pollock fisheries within SSL critical habitat. The study determined that collection of high-quality acoustic data adequate for management purposes was feasible using commercial fishing vessels. The study also showed that pollock aggregations in the Aleutian Islands are spatially dynamic, but, because of the small size of the 2006 study area (180 nm²), the study could not resolve the spatial extent of pollock movement. It was concluded that future work should consider the expansion of the techniques pioneered in 2006 to survey a larger area within the central Aleutian

Islands to determine the status and spatial dynamics of pollock within SSL critical habitat. In addition to achieving its scientific objectives, this project fostered an excellent working relationship between NOAA Fisheries Service, the Aleut Corporation, and the fishing industry.

Research Description: The objective of the 2007 AICASS is to provide baseline data on the distribution and abundance of pre-spawning and spawning pollock in the central Aleutian Islands fishable by an Adak-based small boat fishery. In addition, the 2007 field work will provide an opportunity to train vessel crews on conducting scientific acoustic surveys. In 2007, two acoustic surveys will be conducted at 2.5 nm transect spacing between 173°W longitude and 179°W longitude on the north side of the Aleutian Island archipelago. The proposed survey area includes all potential pollock fishing grounds within catcher trawler delivery distance of the Port of Adak.

The first survey will be conducted prior to the commercial fishery in late February, when pre-spawning aggregations of pollock become most dense along the Aleutian shelf edge. The second survey will be conducted in early April after the fishery has been completed and pollock have begun active spawning. Two surveys are necessary to capture the variability in distribution and abundance between pre-spawning and active spawning pollock and possible fishing effects.

Verification tows will be conducted during the surveys to determine the species composition and biological attributes of the observed acoustic signal. To save time, survey effort will be split between two commercial fishing vessels equipped with calibrated ES-60 echosounders. Inter-ship comparisons between the two survey vessels will be conducted at the completion of the first survey as per Simmonds and MacLennan 2005. Survey activities aboard one vessel will be directed by an agency staff person. The only funding to AFSC will be for two trips by NOAA Fisheries Service staff between Seattle and Adak Island. All other survey costs—including ship time, fuel, and crew salaries—will be absorbed by the Aleut Corporation and the survey vessels. These costs should be offset by allowing limited commercial fishing between surveys within SSL critical habitat as part of an exempted fishing permit (submitted concurrently). The survey data will be analyzed by an AFSC staff person and results will be disseminated through an AFSC processed report. A peer-reviewed journal article will be produced on the development of the AICASS. All survey results will be presented at a 2007 North Pacific Fishery Management Council (NPFMC) Science and Statistical Committee meeting and Advisory Panel meeting, and at a publicly announced meeting at the Adak Island High School involving the Aleut Corporation, Adak Fisheries LLC., fishermen, and the local community.

Project Title: Fishing Technology and Conservation Engineering to Reduce Bycatch and Damage to Seafloor Animals

Overview: The Conservation Engineering Division of the AFSC applies cooperative research to improve fishing gear and methods to achieve bycatch reduction and address the effects of fishing gear on seafloor habitats. The program combines its scientific

techniques and direct observation tools with the gear and fishing expertise of industry partners to design and test solutions to these issues. Funding is needed for fishing vessel costs, one assistant biologist, freight, travel, and supplies to pursue these opportunities. Partner organizations have included the North Pacific Fisheries Research Foundation, the Marine Conservation Alliance Foundation, the Groundfish Forum, the Alaska Draggers Association, Lummi Fisheries Systems, Trident Seafoods, Dantrawl, NET Systems, and United Catcher Boats. Other projects may be pursued with individual fishermen or gear designers.

Research Description: In consultation with partners, the following projects will be pursued. Some are continuations of prior years' cooperative studies and others are new initiatives. The main projects will be:

- (1) Development of halibut excluders for Gulf of Alaska fisheries for shallow water flatfish and cod. Excluders for the cod fishery will be tested under an exempted fishing permit in October 2006 and follow-up research will be conducted later in the year. This work is being done in cooperation with Alaska Draggers, the Alaska Groundfish Databank, and Marine Conservation Alliance Foundation.
- (2) Further modifications and improvements of a trawl prototype system to reduce salmon bycatch. This system is being developed in cooperation with United Catcher Boats and the North Pacific Fisheries Research Foundation, with support from several other fishing companies and organizations. The NOAA Transition Board is tracking this development effort as an example of technology transfer.
- (3) Development and evaluation of trawl groundgears that cause less damage to living structure in soft bottom areas. Field-testing of the initial prototypes for bottom trawl sweeps is being completed in September 2006 and will be presented to the North Pacific Fishery Management Council in December 2006. Continuing work may address reducing the effects of bottom trawl footropes or pollock trawls. The Groundfish Forum and the H&G Environmental workgroup are industry partners for this research.
- (4) Measuring injury rates of crab that encounter trawl gear. This new project will use recapture techniques developed during a 1998 study of red king crab encounters with trawl footropes. The Marine Conservation Alliance Foundation is a potential partner for this work.

Project Title: Sablefish Logbook Program

Overview: Alaska Fisheries Science Center scientists, in cooperation with Alaska's longline industry, have been conducting a sablefish logbook program to index sablefish abundance based on commercial fishery data. The logbook time series, which dates back to 1997, was recommended by the North Pacific Fishery Management Council and its Scientific and Statistical Committee and Advisory Panel. The data provide fleet effort and distribution information for the entire 10-month season, and are used along with the

summer assessment within the sablefish assessment model. Unfortunately, NOAA Fisheries Service does not have a dockside program to collect logbooks and verify information from fishermen, but the International Pacific Halibut Commission (IPHC) has an active dockside data collection program for the halibut longline fishery. The AFSC proposes to use IPHC port samplers to collect sablefish logbooks from fishermen. Using their experienced samplers will increase data quality and the visibility of the sablefish logbook program. Using an existing dockside program will be less expensive than an independent dockside program for sablefish.

Research Description: The AFSC proposes to support IPHC collection of sablefish logbooks, data editing based on skipper interviews, and entering of the edited data into a database. The IPHC has requested they enter the edited data to protect confidentiality of fishery records they handle. Confidential logbook information will be provided to Auke Bay Laboratory scientists in the form of an Access Database.

Project Title: Atka Mackerel Tag Recovery in the Aleutian Islands

Overview: The North Pacific Fisheries Foundation has been working with the Fisheries Interaction Team (FIT) from the AFSC on a continuing research study to determine Atka mackerel movement and abundance in localized areas in the Aleutian Islands. The purpose of FIT's research is to evaluate the efficacy of trawl exclusion zones (TEZs) in preserving local abundances of Atka mackerel—the dominant prey of Steller sea lions (SSL) in this region. From 2000 to 2006, Atka mackerel have been tagged, released, and recovered at Seguam Pass, Tanaga Pass, Amchitka Island, and Kiska Island. Local abundance and movement probability are estimated with an integrated model that uses maximum likelihood to estimate all parameters simultaneously. Results to date suggest that TEZs in Seguam and Tanaga Passes—where Atka mackerel biomass is relatively high and movement is relatively low—may be effective at preserving local Atka mackerel aggregations. In contrast, the TEZ at the south end of Amchitka—where biomass is low and movement is high—may be less effective. Recent telemetry data from Steller sea lions outfitted with satellite transmitters show animals occupying areas from Tanaga to Agattu Islands, presumably for foraging. Many of these areas overlap with areas of high Atka mackerel abundance and localized fishing effort. The results from this study will also provide Atka mackerel population estimates that can be used as ancillary information in the stock assessment and management of Atka mackerel. The study also provides invaluable opportunities for biological and ecological research in Atka mackerel biology and the Aleutian Island ecosystem.

In 2006, the project was supported largely through funding provided by the North Pacific Fisheries Foundation (NPF), a non-profit organization formed by members of the fishing industry to support research essential to the conservation and management of North Pacific Atka mackerel and other fishery resources. At-sea work in FY 2007 will be conducted as a Joint Project under a Memorandum of Agreement with NPF, just as it was in 2006 (pending approval).

Research Description: In 2007, AFSC scientists propose to recover tagged Atka mackerel in areas of high Atka mackerel abundance in the Aleutian Islands where the commercial fishery has historically targeted the species (i.e., Seguam Pass and Kiska Island). The Western Aleutians is an area of particular concern because it is one of the few areas where SSL population numbers are still declining. Scientists also will collect biological and oceanographic data in these areas. Tag recovery will take place on a vessel chartered by the NPPF.

Northwest Fisheries Science Center Cooperative Research

Project Title: Personnel and Associated Management Costs

Overview: Funding will be allocated to support staff coordinating the groundfish cooperative research program at the NWFSC. Overall objectives of this program are to:

- Enhance the collection of information on groundfish species and their associated ecosystems by working cooperatively with fishermen on the West Coast to collect information.
- Improve the clarity and credibility of fisheries information used for fisheries management on the West Coast.
- Increase the trust and empathy between fishermen and fisheries scientists.

Research Description: Funds will support the associated costs for staff travel and incidental supplies. The goal will be to provide personnel to support the continuing multifaceted program, which in the past has included a port liaison project that compensated fishermen who participated in research planning and data collection. Each of these cooperative efforts has effectively leveraged resources and created important opportunities and benefits for NOAA Fisheries Service research and for the fishing community. Personnel will ensure the broadest participation in cooperative research, monitor the quality of research, provide guidance on research planning and budget, and conduct outreach to constituents about the program.

Project Title: Cooperative NOAA Fisheries Service/Industry Surveys

Overview: Since 1998, NWFSC has conducted resource surveys in cooperation with commercial fishing vessels. These surveys provide important information about distribution, abundance, and age structure of groundfish populations. The industry and the NWFSC have been working cooperatively to develop several surveys for species that are not well surveyed by existing trawl surveys—i.e., widow rockfish, canary rockfish, and a suite of recreationally important fishes. Specifically, NWFSC has begun a hook and line and genetic tag-recapture study of rockfish (particularly bocaccio and vermillion rockfish) in the Southern California Bight with the recreational charter boat industry. The objective of this survey is to improve the tracking of the status of these populations. The funds requested here support the continuing development of this survey.

Research Description: The usual bottom trawl survey methods are not appropriate for surveying rocky habitat in the Southern California Bight. For species such as bocaccio rockfish—whose primary habitat is untrawlable—it is imperative that we expand our operational surveys to these areas. We are combining routine hook and line methods with tests of innovative genetic tag recapture methods to develop a survey that can be routinely conducted to assess rockfish populations. This work was initiated with a series of industry workshops to specify key areas that were particularly important for targeted surveys. Since then we have completed a full test series for surveys in cooperation with the recreational fishing industry on chartered vessels. This has provided initial information on habitat types and fish density as well as tissue samples to use in developing individual genetic identifications for a variety of species.

In FY 2007 we will target several specific goals:

- (1) Conduct intense tag recapture sampling on board chartered vessels in one targeted area.
- (2) Host a workshop with the participation of outside experts in survey design to review the results of the survey to date and to provide recommendations for further implementation of the survey.
- (3) Develop a plan to initiate a program with recreational charter boats to collect fin clips from charter vessels to test the potential for using these methods to obtain “tag” returns of genetic information.

Project Title: Continuation of the Port Liaison Project Using Fishers Knowledge to Add Value to Research, an OAR/NOAA Fisheries Service Collaboration

Overview: One of the most successful cooperative research projects implemented on the West Coast has been the Port Liaison Project (PLP). While many projects have focused on vessels willing or able to charter their vessels for significant amounts of time, few have focused on the individual fisherman—i.e., captain or crew who would like to become more involved in research. The PLP focuses on providing funding to fishermen interested in participating directly in research but who are not able to participate by developing proposals or by chartering vessels.

Research Description: The PLP began as a pilot project in 2002 to test the viability of a program that engaged individual fishermen in research projects. The program is a coast-wide collaboration between OAR-Oregon Sea Grant and the NWFSC. The PLP connects fishermen with researchers (agency, academic, and nongovernmental organizations), adding value to existing (funded) research projects by incorporating fishermen’s knowledge. Individual fishermen are paid for their time to assist in academic or government research. Researchers formally request assistance for a variety of tasks, ranging from proposal review to actual data collection. Local fishing community Port Liaisons—contracted by the project in California, Oregon, and Washington—then match fishermen with researchers. This pilot program has supported the involvement of 166

industry cooperators to participate in over 40 research projects. Program evaluation indicates that the PLP has overwhelmingly met its goals of improving the relationships between the fishing and research communities and of adding value to research projects. The project is led by a steering committee composed of community leaders, fishermen, and academic and state researchers. Project success was monitored by questionnaires answered by both the researchers and the fishermen. Over 80 percent of the researchers and 70 percent of the fishermen indicated they felt the project had improved mutual understanding between the fishing and research communities. This project builds on the outreach experience of OAR Sea Grant Extension and the communication channels established by NOAA Fisheries Service with the fishing industry. Its success and positive reception by both industry and researchers indicates that it could be a model for similar programs nationwide. However, if it is to be continued or expanded past the initial phase, additional support of this outreach effort is needed.

Southeast Fisheries Science Center Cooperative Research Program

Project Title: Supplementation of the Southeast Cooperative Research Program

Overview: The objective of the Southeast Cooperative Research Program is to conduct high-priority research projects that have been identified in concert with the regional councils and industry, and that will address critical research needs. This program is consistent with Government Accountability Office (GAO) recommendations to heighten working relations with stakeholders. The spending plan reflects the Region's highest priorities for cooperative research and supports both ongoing and new project proposals selected through the FY 2006 competitive process advertised in the *Federal Register*. A broad range of external recipients are identified in the spending plan, including commercial and recreational fishermen involved in the highly migratory species, Gulf of Mexico, and Southeastern U.S. Atlantic fisheries, and southeastern region state, private, and university researchers.

Congressional funds are appropriated to conduct the Southeast Cooperative Research Program in addition to funds provided by the national program. The Southeast plan provides funding for a broad array of external recipients. The plan includes projects started in earlier fiscal years for which there is a need to continue the activity and projects that will be selected based on the competitive solicitation process for funds advertised in the *Federal Register*. Due to funding limitations, the full range of high-priority cooperative research demands within the region could not be fully met in FY 2006, and a process for prioritizing competitive requests for funding is under way. Specific projects that may be supported with National Cooperative Research Program funding in FY 2007 include the following:

Cooperative research on bycatch reduction devices (BRDs) effectiveness in finfish reduction and shrimp retention during commercial shrimping operations in the southeastern U.S. Atlantic.

Minimizing bycatch continues to be a very high priority for the NOAA Fisheries Service in the Southeast. Outreach and education are critical components of reducing bycatch,

and the agency has worked closely with industry to develop new gear and to promote clean fishing practices in all of the fishing sectors. This research continues a cooperative effort between the shrimping industry and the Southeast Fisheries Science Center Galveston Laboratory. The primary objective of this research is to collect observer data on bycatch during commercial shrimping. Observer data will be used to further refine catch rate estimates of finfish and shrimp by area and season for this fishery. Vessel compensation is a critical aspect of this activity, and these funds will be used for that purpose. This activity is a carry-over from prior years' commitments and activities.

Cooperative research on bycatch related to hook and line fisheries in the Southeast.

Bycatch characterizations pertaining to catch, effort, size frequency, and detailed data on fishing areas are important to assessments. In particular, estimates of amounts, disposition, and discard composition from commercial and recreational fishing operations are the key concerns being addressed. Cooperative research with the commercial sector is being conducted by an observer program through the SEFSC Galveston lab. Outreach projects to incorporate the recreational sector are being proposed through the SERO.

Cooperative research directed toward recreational fisheries.

The Southeast Data, Assessment, and Review (SEDAR) process indicated that the recreational sector is a growing component in the assessment of Southeast fisheries. Data relating to effort in time and space distributions, catch composition, samples related to length frequencies, and ages in this sector is limited. Potential areas being explored are observers, recreational logbooks, and volunteer creel surveys from recreational fishing clubs. Outreach efforts are planned to communicate to the recreational sector the need for this information and propose projects with recreational leads to collect and submit data to meet these needs.

Cooperative statistics data collection.

Fishery-dependent statistics are collected by various organizations throughout the southeastern United States. It is critical that standards and procedures be established and followed for the collection and data management of fishery statistics. The purpose of this cooperative data collection is to ensure that all statistics are collected using similar procedures and that all statistics are compatible and can be combined into a comprehensive database for stock assessment and other scientific or management analyses. This is accomplished through grants to the states in the Southeast Region. This is a carry-over of prior years' commitments to this cooperative research activity.

Potential projects based on FY 2007 competition for funds.

Selection of the awards from FY 2006 will be finalized in FY 2007 and will follow procedures outlined in the *Federal Register* notice. Projects are eligible for funding subject to technical review and recommendations received from the CRP Panel which consists of non-NOAA fishery experts.

Northeast Fisheries Science Center Cooperative Research

Project Title: Oversight and Outreach Activities to Support RSA Programs and Integration of those Activities with the Northeast CRPP

Overview: The Northeast Fisheries Science Center (NEFSC) will assume additional management responsibilities for Mid-Atlantic and New England Research Set Aside programs (RSAs) during FY 2007. The NEFSC will increase communication, outreach, and oversight of these programs in an effort to increase participation and to provide additional data on which to base fishery management decisions. The key measure of the success of the program is to enhance confidence and understanding of the scientific basis for management decisions. The funds will pay for coordination, program leadership, and outreach activities that will encourage constituents to become involved in the program and to assess and translate program results for management.

The NEFSC will assume responsibility for the management and oversight of 26 RSA grants, as well as for the management of three established annual grants funding RSA programs (scallops, monkfish, and mid-Atlantic transect survey) and a pending herring RSA.

Project Title: Study Fleet Phase III Implementation, Monitoring, and Analysis

Overview: Stock assessments routinely use data that describe the performance of fishing vessels as indices of abundance (e.g., catch per unit of fishing effort). Critically important in stock assessments are data on fishing effort (e.g., fishing method/tow speed and haul duration, mesh size, area fished), catch and landings characteristics (e.g., species/size/sex age composition), disposition of the catch (e.g., discards versus landings), and environmental factors affecting catches (e.g., water temperature, depth, habitat type). These data are usually collected by (1) observers at sea, (2) self-reporting by the fishing industry in logbooks, or (3) via dockside interviews. All of these methods have limitations (e.g., observers are expensive; dockside interviews are limited in scope).

A study fleet is a group of cooperating fishing vessels/operations that provide accurate, detailed (temporal and spatial), and comprehensive data than would be obtained without deploying expensive observers. The study fleet concept focuses on electronic reporting mechanisms for haul-based data, as compared to trip or sub-trip composite records typical of mandatory trip reports in the Northeast. Study fleet participants helped design and test the program. Special equipment (laptops linked with GPS units and temperature data loggers) has been tested, and 30 vessels were participating in the evaluation and field testing of electronic data acquisition systems when the contract ended during the third quarter of FY 2005.

Additional software development work and an analysis of the data collected during the initial phases of the logbook program were completed during FY 2006. In FY 2006, a

VTR (sub-trip-gear) electronic reporting application development project was coordinated with the NERO Fisheries Statistics Office and the Cape Cod Commercial Hook Fishermen's Association, resulting in an application that supports two modes of reporting on the same set of foundation coding tables. A limited deployment (six vessels) of the updated software application was initiated in the last quarter of FY 2006. There is ongoing industry interest in finalizing the software development of an electronic reporting system that could satisfy permit-related reporting requirements. In addition, the New England Council and the Research Steering Committee are starting to consider fleet-focused deployment options for expanded electronic vessel reporting in 2007.

Experienced stock assessment staff are required to work with industry and management partners in planning for study fleet expansion, in continuously interacting with participants during implementation, and in collaboratively managing, analyzing, and distributing the acquired data. Existing senior stock assessment staff supported these activities during the pilot stage, but will not be able to support final system modifications, implementation planning, and ongoing analysis planned for FY 2006 and beyond. This applies particularly to finalizing the processes necessary to ensure timely availability of these records to the Northeast Regional Stock Assessment Workshop (SAW) process.

Research Description: The NCRP funding supports a senior analyst within the Resource Evaluation and Assessment Division, Population Dynamics Branch. This position is responsible for ensuring that any expansion or revision of the vessel/fleet deployment scheme provides an appropriate statistical sample of haul-based records to complement the trip records submitted under other monitoring programs, and that the resulting data address management priorities.

Specifically, the analyst monitors monthly data submitted by participating vessels, and works with technical staff in the Population Dynamics Branch and Data Management Systems Office, along with the NERO Fisheries Statistics Office and Information Resource Management Office, to ensure that data quality assurance standards are satisfied. In collaboration with stock assessment staff responsible for specific species, the analyst will determine the appropriate number of vessels and their operational characteristics (survey design for gear, fishing area, vessel size, etc.) that need to be added to the study fleet to improve the precision of population estimates or trend analyses, and address concerns about bias in sampling. In collaboration with senior NEFSC management and the manager of cooperative research, the analyst will develop a study fleet sampling evaluation plan to ensure the appropriate allocation of sampling effort commensurate with desired levels of assessment precision. This evaluation will support an expanded implementation plan responsive to assessment priorities developed in the SAW process, as well as management priorities and issues identified by NERO, Fishery Management Councils, state management agencies, and industry constituencies.

Project Title: Equipment and Operating Costs to Support Cooperative Research Projects

Overview: Cooperative research projects between 2000 and 2006 have provided greater

experience with respect to costs for vessel charters, field expenses and labor, deployment and post-deployment support, data processing, and final information dissemination. The FY 2006 NEFSC Cooperative Research spending plan primarily supports FTE positions that partially address these needs. Additional operational funds are required to support cooperative research projects that are of ongoing importance to the NEFSC, NERO, the Councils, and industry constituencies.

Research Description: The projects to be supported by the requested operational funds include:

- Yellowtail flounder and black sea bass tag-recapture data processing.
- Mark-recapture priority experiments identified by the SAW.
- Initiation of requirements analyses for data archiving of Northeast gear experiments.
- Equipment, travel, and overtime to support fieldwork including industry-based surveys (e.g., Gulf of Maine cod and the mid-Atlantic transect survey), and added collaboration with state agencies to support increased adoption of electronic data capture technologies at sea.

The requested funds will also cover staff travel to cooperative research meetings of the Councils and constituent groups, data entry costs, expendable field equipment, and (depending on SAW recommendations) a limited amount of funding for tagging supplies and vessel contracts (commercial and/or recreational).

Tag reward funds and ongoing support for recapture data processing. Recaptures for both black sea bass and yellowtail are expected to occur over the next few years, requiring ongoing outreach and data processing. In addition, because the NEFSC has developed infrastructure and experience to support mark-recapture projects, there is scientific interest in additional tagging efforts focused on high-priority management species. The current species of interest include scup, haddock, and dogfish. The mark-recapture study for black sea bass provides the only empirical estimate of exploitation rate for this species in support of the fisheries management plan. This program was initiated in 2002 (2- to 3-week period in May and repeated in September). Previous tagging has involved chartering commercial and recreational/charter vessels from Massachusetts to Virginia. In addition to the costs associated with vessel charter, monetary rewards are paid for a subset of tag returns for the purpose of documenting the tag reporting rate.

Industry-based surveys are expanding in the mid-Atlantic and Northeast. NEFSC support includes the at-sea presence of NEFSC Cooperative Research staff on 220 survey sea days between 2004 and 2006, provision of the standard survey deck logs, initial post-cruise screening of deck logs, data entry, and auditing support. Additional work is planned to upgrade the survey system capabilities to deal with unique characteristics of industry-based surveys, enhanced electronic data streams from gear mensuration, and vessel/deck-based electronic systems.

Northeast Regional Office Cooperative Research

Project Title: Activities to Support Exempted Fishing, NEPA, and Other Associated Consistency Reviews for the Northeast CRPP

Overview: The mission of the Northeast CRPP is to increase communication and collaboration among agency scientists, managers, commercial and recreational fishermen, and other constituents. The aim is to provide additional and enhanced information on which to base fishery management decisions. The key measure of the success of the program is to increase public confidence and understanding of the scientific basis for management decisions by direct involvement in collaborative research among constituents and agency staff. The NCRP funds will pay for regulatory consistency reviews for the Endangered Species Act (ESA), National Environmental Protection Act (NEPA), Marine Mammal Protection Act (MMPA), and other federal regulations. Activities will ensure that all regulatory requirements associated with federal funding are considered and followed.

Research Description: Each year, both the regional cooperative research program and RSA provide direct funding or fishery resource allocations to fund research projects. All federal funding must receive a constituency review to ensure that federal laws and regulations are not violated during the conduct of federally funded research. The Northeast Regional Office (NERO) will provide technical expertise to review each regional cooperative research program and RSA proposal submitted to the NOAA Fisheries Service. Each competitive solicitation will receive regulatory consistency review documentation from all NERO Divisions (NEPA; Habitat; Protected Resources; Sustainable Fisheries; Fisheries Statistics; and State, Federal, and Constituent Affairs). Documents will articulate specific concerns of each division concerning proposed research and the potential impact or regulatory legality of funding such work. Each Broad Agency Announcement (BAA) for contracts or Federal Funding Opportunity (FFO) for grants will be reviewed and documented. It is anticipated that approximately three to six regulatory consistency reviews will be performed during FY 2007.

Southwest Fisheries Science Center Cooperative Research

Project Title: Cooperative Albacore Archival Tagging Program

Overview: Southwest Fisheries Science Center (SWFSC) scientists have been working with the American Fishermen's Research Foundation (AFRF) since 2001 on a study to determine migration patterns and general life history strategies of North Pacific albacore. North Pacific albacore are targeted by various fisheries in any given year, including fleets from the United States, Japan, Taiwan, and Canada. Tagging trips are conducted on vessels chartered through the Western Fishboat Owners' Association (WFOA), which is the parent organization of AFRF. Nearly 500 tags have been deployed to date during this long-term study.

Research Description: Preliminary analysis of the movements of 14 fish, 12 of which were at liberty for close to or beyond 1 year, demonstrates that six albacore remained in the Southern California Bight or in waters to the southeast along Baja California. Five albacore ranged into waters midway between southern California and Hawaii, and two made broader movements into waters north of Hawaii beyond 150°W. Latitudes are estimated with high uncertainty and will require further refinement using satellite sea-surface temperature imagery. Two archival tags were recently reported recovered from Taiwanese longline vessels. The two tags were out for 449 days and 691 days, the longest time at liberty for archival-tagged albacore. These are the first tags recovered from fish that were tagged as juveniles in the West Coast U.S. troll/bait boat fishery and recovered in the Taiwanese longline fishery. Once analyzed, the data will shed light on migration habits and the behavior of albacore as they grow and recruit into different fisheries. Archival tag data are integral to providing accurate information of North Pacific albacore migratory behavior and distribution and, ultimately, to developing sound stock assessments regarding the status of this valuable marine resource.

Results from this study will be assembled into data products for the North Pacific Albacore Assessment and Working Group meeting. Stock assessments for Highly Migratory Species (HMS) are conducted by scientists from numerous fishing nations and provided to international bodies for management advice. Although the quality and level of peer review varies widely, in many cases no other information regarding stock status is available for U.S. fishery managers. Because albacore is included in the Pacific Marine Fishery Management Council's HMS Fishery Management Plan, involvement in these assessments through international forums is necessary to provide advice to U.S. managers. Data products from this study will inform the assessment of this stock, helping to maintain it as an adequately assessed stock under the GPRA measure "Percent of Living Marine Resources with Adequate Assessments." It is also a priority species tracked by the Fish Stock Sustainability Index (FSSI). This project aims to improve the FSSI score for North Pacific albacore by improving migration information for stock assessments.

Project Title: Cooperative Rockfish Surveys Using Advanced Sampling Technologies Archival Tagging Program

Overview: Marine sportfishing in Southern California is a huge industry that must be monitored and managed by non-lethal fish surveying techniques. Statewide, marine sportfishing anglers are estimated to spend \$64 million annually on party and charter fees to board Commercial Passenger Fishing Vessels (CPFV), and an additional \$98 million on other trip-related expenses. Add 40 percent above direct expenditures on fishing-related goods and services, and the total economic value of the CPFV recreational trips exceeds \$200 million per year. As of 2005, there were 313 operated CPFVs statewide, logging 614 thousand angler-trips, and approximately 211 of them (valued at \$80 million) operated from harbors in the Southern California Bight (SCB). Meanwhile, the stocks of lingcod and six rockfish species, including four species important to California anglers and commercial fishermen (bocaccio, canary rockfish, widow rockfish, and cowcod), are estimated at or below 25 percent of their pristine levels, and have been

declared overfished by the Pacific Fishery Management Council (PFMC). In response to this potential ecologic and economic disaster, two marine conservation areas were recently created in the SCB. To assess the habitat and stocks of selected rockfish species in these areas, the SWFSC has developed a non-lethal surveying technique for use in cooperation with the CPFV fleet. The method combines the information obtainable from multi-frequency echosounders mounted on CPFV and/or NOAA vessels, and video and still cameras deployed from a remotely operated vehicle (ROV).

Through its cooperative research rockfish project, the SWFSC routinely surveys rockfish in the SCB using the new acoustical-optical method in support of the PFMC and the West Coast Groundfish Fishery Management Plan (FMP). The acoustical-optical survey method exploits the advantages of each measurement technology. Beginning with historical fishing maps, multi-frequency echosounders are used to map the potential habitat (e.g., rocky areas), and the rockfish dispersion and abundance within these strata; the video and still camera images are used to validate the acoustical classifications and to quantify the relative numbers of each species and their sizes. Ultimately, the acoustically estimated rockfish abundance is apportioned to species using the optical data, and then mapped.

Research Description: Performance for this project will be measured by the completion of a successful 30-day acoustic/ROV survey of demersal fish in the Southern California Bight and the mapping of hard bottom habitat. Biomass estimates for recorded species are being made from density estimates and habitat area maps, which will allow NOAA Fisheries Service and the PFMC to monitor the recovery of these overfished stocks. The survey methodology developed using these advanced technologies is being reviewed through an independent peer-review process, validating the methodology for assessment and monitoring of fish stocks. This survey methodology will benefit the NOAA Fisheries Service both locally and nationally, because surveying fish over hard bottom is problematic throughout the U.S. Exclusive Economic Zone (EEZ). Particularly, in Southern California, our ability to monitor the recovery fish stocks in the Cowcod Conservation Area will improve. Results from these surveys are used to inform stock assessments under the GPRA measure “Percent of Living Marine Resources with Adequate Assessments,” and provide necessary scientific advice for the management of stocks under the PFMC’s West Coast Groundfish FMP.

Project Title: Cooperative Large Pelagics and Endangered Species Surveys

Overview: This project takes advantage of the long-range capacity of the sportfishing fleet to survey and conduct biological studies in Mexican waters for commercially and recreationally important fish (managed under the PFMC’s FMPs for highly migratory, coastal pelagic, and groundfish species) and for marine invertebrates (managed under the Endangered Species Act). During the first year, the SWFSC worked in cooperation with the fleet toward designing and implementing survey methods for monitoring the catch and the economic value of trips into Mexican waters. Statewide, marine sportfishing anglers are estimated to spend \$64 million annually on party and charter fees to board Commercial Passenger Fishing Vessels (CPFV), and an additional \$98 million on other

trip-related expenses. Add 40 percent above direct expenditures on fishing-related goods and services, and the total economic value of the CPFV recreational trips exceeds \$200 million per year.

With the increase in Mexico's fishing tourism and commercial fisheries development along the Baja coast, there has been an increased focus on fishery resources off Baja and their joint exploitation by U.S. and Mexican fishermen. The newly reenergized MEXUS-Pacifico joint research framework provides an opportunity to examine the biology and exploitation patterns of pelagic fish stocks that straddle and seasonally migrate between the two countries. Data products produced from this study will inform the assessments of fish stocks under the GPRA measure "Percent of Living Marine Resources with Adequate Assessments," and provide necessary scientific advice for the management of stocks under the PFMC's Highly Migratory Species FMP.

Research Description: Short- and long-range CPFVs will be used as platforms for studying the biology of pelagic fishes including: application of conventional and electronic tags, biological sampling of life history parameters, and plankton surveys for spawning activity and spawning location. These trips are likely to fall under two categories: (1) sending a single U.S. or Mexican scientist on scheduled sportfishing trips to collect basic biological information on the catch, such as species composition, sex and length frequencies, as well as DNA sampling for stock structure studies on species of interest; and (2) chartering a vessel for a dedicated trip to systematically survey areas for nearshore or pelagic fish and conduct tagging studies on species of interest. The SWFSC plans to work with the CPFV fleet and Mexican scientists through the MEXUS-Pacifico forum to supplement data collection contributing toward more effective management both north and south of the border.

Specific deliverables are:

- Use the long-range capacity of the sportfishing fleet to survey and conduct biological studies in Mexican waters for commercially and recreationally important fish managed under the PFMC's Highly Migratory Species FMP and for white abalone under the Endangered Species Act.
- Use short- and long-range CPFVs as platforms for studying the biology of pelagic fishes including: application of conventional and electronic tags, biological sampling of life history parameters, and plankton surveys for spawning activity and spawning location.
- Work in cooperation with the fleet toward designing and implementing survey methods for monitoring the catch and the economic value of trips into Mexican waters.