

## New Fisheries Monitoring and Analysis Division Assumes the Role of the North Pacific Groundfish Observer Program

By

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The history of the North Pacific groundfish fisheries dates back to the days of a large commercial wind-powered fishing fleet. Built in 1897, the *Wawona* was the highliner of the fleet and is still afloat in Seattle. Photo courtesy of Puget Sound Maritime Historical Society and Northwest Seaport.

The North Pacific Groundfish Observer Program is the largest fisheries observer program in the United States. Funded largely by industry, the Program deploys approximately 400 observers who spend roughly 36,000 days at sea each year to collect data for use by the National Marine Fisheries Service (NMFS) in managing the Alaska groundfish fishery. The Alaska groundfish fishery is recognized as one of the best managed fisheries in the United States. The North Pacific Fishery Management Council (NPFMC) cites an effective monitoring system, with the Observer Program at the core, as the key to successful management of the Alaska groundfish fishery. Indicative of the Program's success and importance to its many constituents is the Alaska Fisheries Science Center's (AFSC) formation of the new Fisheries Monitoring and Analysis Division with the Observer Program as its foundation. The following article traces the evolution of the Program and considers the future of this vital component of the North Pacific fisheries management infrastructure.

### History of the North Pacific Groundfish Fisheries

Roughly half of the U.S. domestic groundfish landings are harvested from the waters off Alaska. This region, which includes the Gulf of Alaska (GOA) and U.S. waters of the eastern Bering Sea and Aleutian Islands (BSAI), yielded 2.2 million metric tons of groundfish or 51% of total U.S. landings in 2003 with a value of approximately \$1.5 billion after primary processing. Targeted Alaska groundfish species include walleye pollock, Pacific cod, sablefish, flatfishes, Atka mackerel, and rockfishes. These species, distributed over a broad geographical area and a range of habitats, are fished with trawl, longline, jig, and pot gear by vessels ranging from small skiffs to large catcher-processor vessels.

The commercial fishery for groundfish in Alaska is reported to have begun in 1864 when the fishing vessel *Alert* sailed from San Francisco to Alaska and harvested 9 tons of Pacific cod in Bristol Bay. A large commercial sailing fleet, including the historic

three-masted schooner *Wawona*, continued targeting cod for decades, with fisheries for sablefish, and Pacific halibut developing during the early 1900s. Japan started exploitation of pollock and flatfish in the 1930s. They ceased fishing during World War II returning to the groundfish fisheries in the mid-1950s and targeted yellowfin sole. Vessels from the U.S.S.R entered this fishery in the late 1950s. Through the 1960s, vessels from Japan and the U.S.S.R. fished with little other competition in the BSAI. As stocks of yellowfin sole declined in the early 1960s due to fishing pressure from Japanese and Soviet vessels, pollock became the primary target species. In the late 1960s and early 1970s, vessels from Taiwan, the Republic of Korea, and Poland entered the fishery. At this time, foreign fishing effort expanded to target Pacific ocean perch in the GOA.

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U.S. fisheries observers were first deployed in 1973 on some foreign vessels in the BSAI as a result of international treaties between the United States, Canada, Japan, and the U.S.S.R. and marked the formation of the Foreign Fisheries Observer Program. The primary duties of observers were to determine incidental catch rates of Pacific halibut in the groundfish fishery and verify catch statistics in the Japanese crab fishery.

In 1976 federal legislation, renamed the Magnuson-Stevens Fishery Conservation and Management Act (MSA) in 1996, laid the groundwork for the U.S. Exclusive Economic Zone (EEZ) out to 200 nautical miles. The purpose of the MSA was to conserve fishery resources, protect recreational and commercial fisheries, and develop domestic fisheries. Licensing, catch, and area restrictions were placed on all foreign vessels fishing in the U.S. EEZ. The MSA compelled development of fishery management plans (FMPs). The need for observer coverage was included in the Alaskan FMPs and the Foreign Fisheries Observer Program was expanded on the foreign fishing fleet. The fleet was also required to pay the cost of stationing the observers aboard their vessels. The sampling duties of observers were expanded to collect data on the incidental catch of king crab, snow (Tanner) crab,

and Pacific salmon, and to obtain biological data on other important species. For observers, working on the foreign fleets offered opportunities to be immersed in a very different foreign fishing culture while doing important work for fisheries management in Alaska.

One of the primary purposes of the MSA was to encourage development of the domestic fishing industry. In the North Pacific, this “domestication” process included a “joint-venture” phase under which domestic and foreign fishing companies established agreements for U.S. fishing vessels to deliver fish to foreign processing vessels. During this phase, U.S. observers continued to be deployed onboard foreign processing ships to collect fishery data. Starting in 1987 in the GOA and in 1988 in the BSAI, foreign vessels were allowed to operate in the EEZ only when participating in a joint venture. Through the joint-venture years, a large domestic fleet with processing capacity developed. The domestic groundfish catch grew from 2,000 metric tons (t) in 1976 to 2.4 million t in 1991, the first year the fishing fleet within the U.S. EEZ off Alaska was comprised entirely of U.S. fishing and processing vessels.

Because the MSA did not provide authority to collect fees from domestic operations to support an observer program, the domestic fleet in the North Pacific developed without the observer coverage needed to collect data for use in making management decisions. Initial efforts to collect fishery information were initiated with substantial industry support. For example, NMFS placed observers on domestic vessels in 1986 to support an industry-fund-



An observer collects a sample from the catch as it moves into the processing factory.



Observers are deployed on a range of fishing vessels and processors. Pictured above is a vessel deploying pot gear.

ed data gathering program in an area of the Bering Sea where bycatch of red king crab was problematic. The NPFMC, through the University of Alaska Sea Grant Program, and the Alaska Department of Fish and Game (ADF&G) created additional small-scale domestic observer programs over the next few years. However, these activities were insufficient to support the management information needs for these emerging fisheries. In response, NMFS and industry pooled resources to implement a pilot domestic Observer Program in 1989, while plans were developed to design a broadscale domestic Observer Program with direct industry funding. The resultant North Pacific Groundfish Observer Program was implemented in 1990 and continues to this day. Under the arrangement the fishing industry contracts directly with a NMFS-certified observer provider and pays to obtain observer coverage. This system provides for industry funding the majority of the direct costs involved with placing observers on vessels and at processing plants in the North Pacific groundfish fishery.

Since the inception of the domestic program in 1990, observers have been consistently deployed on U.S. fishing vessels in Alaska. In July 2005, a milestone was reached when the 10,000th North Pacific groundfish observer cruise was documented. Every one of these cruises represents the collective efforts of many individuals representing NMFS, the fishing industry, the observer community, observer contractors and others in support of the most extensive fishery monitoring program in the United States.

## Fisheries Management in the North Pacific

Both fishery-independent and fishery-dependent information are required for stock assessment. AFSC scientists obtain fishery-independent data from research surveys conducted by scientists aboard dedicated or chartered research vessels. Fishery-dependent data, however, are the only source of information on the spatial and temporal distribution of fishing mortality and the biological characteristics (such as size and age) of harvested catch and bycatch species. Such data are obtained exclusively from fisheries observers. The use of observer data is critical to the effective management of quotas and bycatch allocations in regions where large amounts of fish are processed at sea and is lauded as contributing to successful fisheries management in the North Pacific. The Pew Oceans Commission in 2003 and the U.S. Commission on Ocean Policy in 2004 each recognized onboard observer programs for the success of efforts to reduce bycatch and effectively manage fisheries. Observer programs provide opportunities for communication between fishermen and fisheries scientists and managers. Additionally, through the data collected by observers unbiased information about the resource becomes available to the public.

Rights-based fishing is becoming established throughout the world. Rights-based fishery management programs in the North Pacific include the Community Development Quota (CDQ) program





Data collected by the FMA Division are used in the study of interactions between seabirds and fishing vessels, such as the the short-tailed albatross pictured above.

for groundfish, Individual Fishing Quota (IFQ) programs for Pacific halibut and sablefish, and, rights-based management of Alaska pollock in the BSAI under a mandate established by the American Fisheries Act (AFA). The success of each of these programs is dependent on the timely and accurate information provided by observers. As the importance of an ecosystem approach to management increases in the Northeast Pacific, greater demands on observers and observer data also are expected.

## FMA Division Clients

In keeping with the NMFS mission, the new FMA Division, with the Observer Program at its core, serves to provide information essential for the management of sustainable fisheries, associated protected resources, and marine habitat in the North Pacific. In order to meet its goals, the Division must be flexible and responsive to the changing information needs of the agency and to changes in fisheries management. The information supplied by the Division is used by many governmental and non-governmental clients.

Several NMFS offices depend on the FMA Division for information which enables their work. AFSC scientists use observer data primarily to support stock assessments. The data is used also to support analyses of management measures under consideration by the NPFMC, research into interactions between seabirds and fishing vessels, and trophic studies. Center scientists conducting studies on marine mammals use observer data for information on the incidental mortality of marine

mammals to fishing operations and sightings of marine mammals.

The NMFS Alaska Regional Office uses observer data in real time to monitor fishing activity and make fishery closure decisions. Observer data are integral to the estimation of overall mortality of target and nontarget species. Furthermore, bycatch quotas can be monitored and methods developed to reduce bycatch through analysis of observer data.

Observers also collect data used by the NMFS Office for Law Enforcement (OLE) for enforcement of fisheries regulations. Although observers do not enforce regulations, they are in a position to witness and report obvious regulatory violations. NMFS enforcement staff review these reports and take action when necessary. OLE also plays a support role by providing for the enforcement of regulations which protect observer safety and working conditions.

Several non-NMFS agencies also rely on observer data extensively for the management and assessment of marine resources. These agencies include the International Pacific Halibut Commission (IPHC), the U.S. Fish and Wildlife Service, the ADF&G, and the NPFMC. Each agency has a role in the fisheries management process, and specific observer data collections are designed to meet their needs. For example, the IPHC uses the halibut mortality estimates derived from observer data as part of the halibut stock assessment process. As well, the NPFMC conducts analyses of potential management actions in conjunction with NMFS and the majority of these analyses use components of the observer data.



One of the many duties of an observer is to sort a sample of the catch according to species. Pictured above is an observer sorting a basket of fish.

The fishing industry uses observer data to evaluate fishing performance and assess specific bycatch issues. Data collected by observers is made available to the owners of the specific vessels upon which the data were collected. In some cases, private businesses contract with fishing companies and associations to access the data to provide analyses of catch and bycatch trends which industry members can use effectively to manage their operations. This strategy has proven effective in reducing bycatch of salmon in the pollock fisheries of the BSAI.

Demands for observer data from the Division's clients increase each year. Rights-based management increases the need for high resolution temporal and spatial data. The same is true for certain types of stock assessment and ecosystem studies. In some cases demands exceed the capacity of the Division or individual observers and prioritization becomes necessary. In some instances, haul-specific catch accounting requirements for rights-based management require two observers aboard catcher-processor vessels.

## Operations

NMFS provides the operational oversight of the FMA's Observer Program, data management, training, debriefing of observers, and the definition of observer sampling duties and methods. The Program deploys up to 220 observers at any one time. To enhance support for the large observer workforce, three field offices were established in Alaska: the Dutch Harbor and Kodiak offices in 1990 and the Anchorage office in 1998. These offices increase the availability of the FMA Division's services to observers and the industry.

NMFS and the NPFMC require high levels of observer coverage. Fishing vessels that are 60 to 125 feet in length or vessels fishing with pot gear are required to obtain observer coverage during 30% of their total fishing days. Vessels longer than 125 feet require observer coverage 100% of their fishing days and, depending on the fisheries in which they participate, some vessels or processing plants are required to receive coverage from two observers during the same time period. The vessel and processing plant owners pay for the cost of the observers who are employees of private observer provider companies.



Working conditions for an observer in the North Pacific can at times be challenging and require physical strength and stamina.

The operational success of the new FMA Division is due, in large part, to private observer provider companies. There are currently five certified observer providers serving NMFS and the Alaska fishing industry. These providers are certified by NMFS to provide observers to industry and conduct the recruiting, hiring, paying, and logistics of observers deployed on vessels and at plants across Alaska. While observer providers are responsible for the personnel and logistical support to meet coverage needs, NMFS provides the observers the technical training to do the job safely and oversees data quality control.

Each prospective observer must pass a training course designed to prepare him or her to collect high quality data and work safely at sea. Training for new observers is a 3-week course covering sampling techniques and procedures, identification of fishes, invertebrates, marine mammals, and seabirds, use of the electronic data entry and transmission system, and safety training. The training course was developed by staff in the FMA's Seattle office and is offered in Seattle and at the University of Alaska Anchorage Observer Training Center (OTC),



Safety awareness is fundamental to the FMA Division. All observers are trained in water safety techniques prior to being deployed to sea.

where the majority of groundfish observer training now takes place. Refresher training is provided prior to each observer's deployment.

A critical part of the training course is safety training. Safety training covers the principles of survival at sea and preparation for emergency situations such as recovering an individual from the water, abandoning ship, implementing distress signals, and using lifesaving and emergency communication equipment. Observer trainees are required to don exposure suits in less than 60 seconds. Wearing exposure suits, observers practice entering the water, swimming, entering and exiting a life-raft, and exiting the water. Observers are trained in completing a predeparture safety checklist to verify the presence of major safety equipment onboard ship. Other training deals with seasickness, sleep deprivation, dietary expectations, and procedures to follow in case of illness. A review of the safety training is included in the recurrent training of experienced observers.

To help observers train and perform their duties while deployed, the Observer Sampling Manual was developed to cover sampling protocols for all vessel or processor types and all fisheries that may be encountered. The manual is updated annually to keep pace with changes in the fisheries and sampling protocols and has been used by many other observer programs in developing their own manuals. A copy is available at <http://www.afsc.noaa.gov/refm/observers/Document.htm>.

The daily work of observers involves sampling the catches of commercial fishing vessels on the

high seas or sampling deliveries of fish to processing facilities and reporting the collected data to NMFS. The work requires physical and mental strength and stamina. Observers must be capable of lifting baskets of fish weighing up to 40 kg and working long, irregular hours. Confined living and working conditions, along with work objectives different from those of vessel personnel, can be stressful. Because of the challenging working conditions, NMFS limits deployments to a maximum of 90 days. This ensures that observers get a break from remote field deployments, while NMFS reviews and processes the data.

Reporting data collected for NMFS for use in fisheries management is a critical part of an observer's duties. Methods used for recording and reporting catch data have evolved considerably. New technology now allows reporting of detailed data directly from vessels at sea and has replaced cumbersome radio, telex, or fax reporting of summarized data. Onboard computers allow observers to enter and transmit data electronically using the FMA Division's electronic data entry and transmission system. The electronic data system has greatly improved the timeliness and accuracy of observer data reports. Near real-time access to the data by fishery managers allows for effective management of the fisheries while they are occurring. Annually, approximately 85% of Observer Program data are transmitted to the new FMA Division's offices electronically.

While deployed in Alaska, observers are required to visit the Dutch Harbor and Kodiak field offices and participate in midcruise debriefings, where they meet with program staff to review sampling methodologies and collected data. All observers are required to undergo a midcruise debriefing during their first and second deployments; thereafter, the midcruise debriefing is required if the observer is deployed to a new vessel type or if previous job performance warrants data review during the deployment. The midcruise debriefing provides the opportunity for indentifying and correcting methodology problems proactively and helps to ensure overall data quality.

Observers on vessels or at processing plants with electronic reporting to NMFS also have the capability to communicate with staff via e-mail to ask questions about work procedures. Individual Observer Program staff are assigned to specific vessels or processing plants and act as advisors to observers assigned to these facilities. This provides day-to-day



field support for the observers. Observers and staff members can discuss sampling procedures and any issues that may arise. Staff members review observer data and provide feedback to the observers on any problems they may detect. This system allows early identification of data problems and provides observers with timely feedback on their work while they are in the field.

After an observer's deployment is complete, the Observer Program conducts a final debriefing. During final debriefing, each observer completes an electronic survey detailing their sampling methods and types of data collected. This is followed by an interview, during which a Program staff member interviews the observer, verifies the collected data, makes any necessary corrections, and provides the observer with performance feedback. Once the debriefing is complete, the data are moved from preliminary to final data tables. Training, midcruise debriefings, advising, and final debriefings are components of the Program's overall quality control process.

The work of a North Pacific groundfish observer is a challenging and unique experience. Most find this job satisfying and rewarding. Many have continued to work as observers for several years, while others have used the experience as a springboard to work in resource management agencies, the fishing industry, or to further their education.

## Future of the Observer Program

The basic design of the North Pacific Groundfish Program has remained unchanged for the last 15 years. Coverage levels are static, some sectors of the



A staff debriefer reviews data with an observer.

fleet (vessel less than 60 ft long) are unobserved, and NMFS is unable to direct observer placement in the observed sectors of the fleet. This is particularly problematic in the 30% observed sector where certain important fisheries are often inadequately monitored. The basic structure of the Observer Program must be changed to enable NMFS to direct observer placement and deployment, match observer skill level with deployment or sampling complexity, and establish observer coverage in unmonitored sectors of the fleet. These changes are necessary to enable the FMA Division to support a flexible sampling design that is responsive to emerging information needs for rights-based fisheries and ecosystem approaches to management.

The NPFMC is considering several alternatives for restructuring the Observer Program to address these data quality and coverage issues. Some alternatives propose that all or part of the groundfish and halibut fleets would be required to pay a fee to NMFS, and NMFS would then contract directly with observer providers to ensure that observers are deployed according to data collection priorities established by the agency. Changes in the MSA may be required to authorize fee collection by NMFS. The NPFMC is expected to select a preferred alternative in 2006; if this alternative is endorsed by the Secretary of Commerce, changes in the program would likely be implemented in 2008.

## Conclusion

NMFS staff, the observer provider companies, and the fishing industry all play vital roles in providing support for the FMA's North Pacific Groundfish Observer Program, but it is the individual observers who form its foundation. Observers work in difficult and remote conditions to collect the information needed to manage Alaska's extensive groundfish fishery. Without their hard work and dedication, our collective efforts to monitor the Alaskan groundfish fisheries would not be successful. The role of observers in the Alaska groundfish fishery will continue to expand as management of the fisheries increasingly relies on observer data. The FMA Division is committed to continue to evolve along with the fisheries to meet the fishery-dependent information needs of NMFS. The FMA Division, with the Observer Program as its foundation, can be expected to continue to be an integral part of the management system for groundfish in Alaska.