

**CANADA - U.S. FISHERIES
OBSERVER PROGRAM
WORKSHOP**

**THE
PROCEEDINGS**

June 26-29, 2000

**Delta St. John's
Hotel and Convention Centre
St. John's, Newfoundland, Canada**

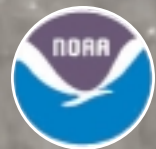


TABLE OF CONTENTS

| | |
|--|------|
| EXECUTIVE SUMMARY | iii |
| COMMONLY USED ABBREVIATIONS | viii |
| DAY ONE | 1 |
| Opening of the Workshop | 1 |
| U.S. Observer Program | 1 |
| Canadian Observer Program | 3 |
| United States Program Review | 4 |
| Canadian Program Review | 7 |
| First Session: General Industry Issues | 9 |
| Second Session: Program Funding Mechanisms | 12 |
| DAY TWO | 16 |
| Third Session: Observer Safety | 16 |
| Fourth Session: Maintaining Observer Corps | 20 |
| Fifth Session: Coverage Levels | 24 |
| Sixth Session: Observer Deployment Strategies | 28 |
| DAY THREE | 31 |
| Seventh Session: Integration of Observer Data | 31 |
| Eighth Session: Observers' Bill of Rights | 35 |
| Ninth Session: Future of Observer Programs and Wrap-up | 39 |
| DELEGATES TO THE WORKSHOP | 42 |



EXECUTIVE SUMMARY

The Second Biennial Canada-United States Fisheries Observer Program Workshop was held June 26- 29, 2000 at the Conference Centre of the Delta Hotel in St. John's, Newfoundland. Over 125 Delegates representing Observer organizations and Governmental agencies responsible for the management and delivery of observer programs gathered to discuss and find solutions to issues of mutual concern.

THE WORKSHOP STRUCTURE

Under the stewardship of the Steering Committee, the 3-day Workshop began with an official welcome and outline of issues to be discussed by participants. The work of the participants would commence with overviews of the Observer Programs in the United States and Canada, followed by Program Reviews. The format also included plenary sessions (and an industry break-off session), initiated by formal panel discussions with question-and-answer periods, depending on time constraints, and concluded with a workshop summary and recommendations for the next biennial gathering.

The U.S. Observer Program

Beginning with a brief historical perspective, the presentation addressed the need for and the work of observers in successful programs. Due time was given to an explanation of the legal authority from which the observer program derived, more specifically the Marine Mammal Protection Act, the Magnuson-Stevens Fishery Conservation and Management Act, and the Endangered Species Act. The presentation spoke directly to the National Observer Program, its mission and objectives that exist to develop national standards and policies, to advocate for more effective funding and to improve communication and outreach. A cogent argument was made that the program must open its process to

all stakeholders, creating workable partnerships with state and federal agencies, while at the same time, working toward creative cost recovery mechanisms.

U.S. Program Review

As part of the review, a trio of panelists spoke about Management Control Reviews that act as safeguards, ensuring that plans proceed and achieve their intended results. Such reviews provide the opportunity to review and reassess control systems. Observer programs bear inherent risks that are affected by a host of factors: cost management, issues associated with recruitment/training/retention, health and safety, insurance and liability, and data processing standards and methods. A presentation was made regarding an independent review of the North Pacific Groundfish Observer Program, citing its history, objectives, structure, coverage levels, cost distribution, and support system. It was pointed out that the system was an interim one, long overdue for improvements, with a more particular focus on observers and their needs. The development of action-plans is needed to determine priorities, at the same time spelling out options, exploring contingencies, defining industry-to-company relationships, and establishing milestones and time-lines for meeting objectives.

The Canadian Observer Program

The comprehensive overview outlined the program's 23-year history, its regulatory framework, national and regional responsibilities, and functional operations. The fundamental objectives of the program center on compliance, scientific data gathering, and management. The overview pointed out that all major Canadian fisheries presently utilize observers as part of their management scheme with program delivery contracted to the private sector, based on a

competitive, open-bidding process, and evaluated through a National Contract and Project Authority.

Canadian Program Review

The review underscored the fact that industry presently pays 70% of the \$9 million deployment costs with the Department of Fisheries and Oceans covering the remaining 30%. For all its financial input, industry has too small a role in the program's design. The establishment of a Program Management Committee was recommended. Present costs, the review stated, should be examined, along with the development of technology-based methods. Coverage levels are too arbitrary and strategic deployment plans should be developed, data-gathering enhanced, and coordination between the various program agencies improved.

THE PLENARY SESSIONS

Over the 3-day workshop period, nine sessions were held, focusing on a number of issues of significant and common importance to the Canada-U.S. Fisheries Observer Programs. In each session, panelists, representing the diversity of program-stakeholders, addressed a broad spectrum of concerns and suggested a wide range of solutions.

First Session: General Industry Issues

Many of the items raised in the first session would later be dealt with in more specific and greater detail. The five panelists signaled a number of important concerns. The problem of reporting sound data was raised: extrapolating data from one form of fishery to another often leads to unsound conclusions and recommendations. Mandatory and comprehensive observer program should be established for all fleet sectors. Observer programs on fishing vessels often impose stressful situations for both observers and fish harvesters. It was recommended that the observer's job be clearly identified not only to the observer but also to those on board a vessel. One panelist suggested that models from other successful observer programs should be studied and, where feasible, introduced, particularly those programs which employ boards represent-

ing the fishing industry, science sectors, government, and the observers. Another panelist pointed out that the risk liability of vessel owners carrying observers needs study. Anecdotal cases of such civil suits were cited. With respect to funding observer programs, a recommendation was made regarding short-term and long-term financing. The next session would deal with the funding problem.

Second Session: Current and Future Observer Programs' Funding Mechanisms

A philosophical basis for the funding of observer programs was presented, stressing that the perception of a program's importance to the industry in particular and global society in general will determine the scope and the willingness of pertinent stakeholders to provide financing. If it's important enough to program survival, the money will be found. It was suggested that the potential funding sources come from the following: Government, industry, total allowable catch set-asides, seafood taxes and labels. The problem of under-funded fisheries was raised: certain sectors require the carrying of observers but provide little funding. In some situations, contractors are required to collect funds for observer expenses; in others, observers are simply not available and waivers are granted. The matter of cost recovery for observer programs was also raised. There appears to be no legal support for cost recovery in certain instances; at the same time, there will be constant difficulty on vessels which have not concluded agreements with an observer company. The "acquisition community," said one panelist, welcomes any innovative ideas and suggestions which can assist in the funding of observer programs.

Third Session: Observer Safety

Participants listened to a range of issues associated with observer safety presented by representatives from the Canada and United States programs. Fishing is an inherently dangerous occupation and observers are facing the same risks as the fishermen. Too often observer safety takes a back seat to operational procedures. It was pointed out that the responsibility for observer safety involves many parties: employers, regulatory

agencies, fishery management agencies, and the observers themselves. It was agreed that safety standards need to be more stringent. In-shore vessels are being forced farther out to sea, often putting all hands at risk. Training in emergency duties is far too rudimentary. Partnerships need to be formed between and among observer programs and management and governmental agencies through which reporting and scientific data can be shared and program limitations can be addressed. A national policy regarding observer programs and safety was suggested. The question of who would be responsible for such a policy was also debated. The panel stressed the need for a study of the legal and liability ramifications of observer programs and practices.

Fourth Session: Maintaining an Experienced Observer Corps

The ability to maintain an experienced observer is a critical issue facing those charged with providing and utilizing qualified observers. The reasons for having an experienced group of observers are fairly obvious: reliability, recording sound data, the cost of high turnover rates. The desirable qualifications for a good observer derive from navigational and marine experience, familiarity with fisheries, training in biological research and enforcement techniques. Retention, panelists suggested, can be enhanced by providing observers with appropriate feedback on their work, establishing effective committees and meetings, providing incentives and allowing for reasonable work levels. Outreach programs can be valuable if directed by all parties - management agencies and contractors. Keeping good people includes the potential for advancement and upgrading. At-sea time for observers must provide a comfortable living wage. There should be flexibility of work schedules; observers must be afforded recognition for their work; enforcement agencies should provide support. Observers need to feel a sense of ownership for what they do. Retention is often problematic for contractors. With high turnover rates, briefing and debriefing require enormous amounts of time, with new observers often susceptible to diversion from their primary work. Criteria for new observers must include post-secondary edu-

cation, ability for unsupervised work, measurable abilities in mathematics and technical writing, and fundamental social and inter-personal skills. Always, the lure of the nine-to-five employment will pose a threat to the retention of experienced observers.

Fifth Session: Determining Appropriate Coverage Levels to Meet Multiple Objectives

In the Canadian setting, a staff officer for Conservation and Protection pointed out, observers fill dual roles of surveillance and science gathering. Frequently, skippers respond only to the so-called "enforcement" component of the observer's role. Fish harvesters may alter their pattern of fishing when an observer is on board. Obviously, the objectives for observers are dependent on what is perceived as primary. Selecting the number and work of observers will depend on the type of fishery: some fisheries will be served better by fishery patrol officers than observers; distance from shore and sovereignty issues will demand 100% coverage. It was agreed that the presence of observers has a high deterrent value. As noted, some captains will change fishing patterns to suit the coverage. Emphasis was placed on the need to establish clear objectives; decisions should be made on the coverage levels with which one can live; coverage for rare species may pose special problems. With respect to science research, data must be used constructively to inform public management debates. Programs can be undermined if the data gathering is seen to be punitive to fishermen. It was pointed out that data provided from vessels often proves that certain fisheries are in good shape. Regarding data samples, it is dangerous to compare data from vessels with observers to those without observers. In many cases, there is a definite linkage between violations and above-normal landings. Panelists spoke of the need to apply sound statistical measures in determining coverage levels. Observer programs must not be seen as the cure-all for scientific data needs. Management and compliance objectives may sometimes conflict. A DFO representative stated that in certain situations the fundamental goals of observer data are to aid fisheries management, to address the alle-

gations of high-grading, to complement the research of other surveys, and to arrive at reliable assessments of stock health. In the final analysis, observer programs must guarantee that the data being gathered is meeting the scientific and management objectives that have been established and which are, it is hoped, clear and unequivocal.

Sixth Session: Implementing Observer Deployment Strategies

With respect to stock assessment, the analysis of observer data and its integration with other collected data are central to deployment. And apart from being useful to scientific investigations, observer data is a source of intelligence for enforcement activities. The discarding of small fish has long been an issue in certain fisheries; hence, the determination of the discard index has become increasingly important with observers being deployed on vessels with a high index. Gathering information on important commercial species faces many deployment obstacles: sea-day schedules are affected by weather and breakdown; diverse fisheries pose scheduling programs because of the difficulty of determining trip-lengths; closed areas and closed seasons have complex sets of regulations; industry will avoid observer deployment. It was suggested that incentives for industry be introduced. Some fishing zones face the difficulty of deciding which vessels should be selected for systematic sampling. In their jurisdiction, vessels may not be obliged to carry observers on consecutive trips; if space is not available on a boat, exemptions may be declared. An observer coordinator recommended that deployment strategies be based on their efficiency, effectiveness and constraints. There must be sufficient time to train observers; deployment must follow the dynamic of fishing activity, responding to one need at a time. The requirements of science and management are not always congruent with those of conservation. In summary, the levels of coverage must be high enough to meet the needs of all the users, and there must be sound knowledge of the fishing activities to permit a deployment strategy.

Seventh Session: The Integration of Observer Data with Other Information Sources

Panelists spoke to the integration of observer data in their respective management constituencies. In the Canadian Gulf region, data (which serves a host of purposes from enforcement and compliance to gear utilization and scientific research) is integrated on a daily, weekly and seasonal basis to ensure an orderly and compliant fishery and to help guarantee that management protocols are achieved. For the Scotia-Fundy region the elements required for integration include data sources such as log-books and monitoring records; it also comprises making comparisons between observed and non-observed vessels. Data integration is often poor, a panelist noted, with little contact between the different groups. Ownership of the data is also problematic. It was agreed that knowledge of database structure was needed. The formal sharing of fishing data within fleets was the first in the North Pacific fisheries, a practice continuing to today and accomplished largely through e-mail. The Alaska Fisheries Science Center has developed electronic data collection software for the process. The integration elements of the New Zealand program include a comparison for validation purposes between fishing logbook data and observer data. Analyses of vessel records show significantly different patterns when observers are onboard. New Zealand has provided for a single comprehensive data warehouse including logbook data, vessel registers, quota management returns and VMS data. Some commented that forums such as the present workshop would help foster understanding among all the participants in observer programs. The Southeast Fisheries Science Center utilizes the Oracle Data System for the provision of reporting accuracy through a series of integration steps whereby common data sets are compiled, compatibility between data sets is checked, other information sources are identified, and unique identifiers are assigned to link different data sources by their lowest common denominator.

Eighth Session: The Observers' Bill of Rights

This session evoked lively and informative discussion with the panelists representing observers

from the Canada-U.S. Programs offering acute insights and recommendations. It was emphasized that in order to guarantee an experienced corps of observers, the basic rights of observers must be protected in a Bill of Rights which would establish the following principles: (a) Observers have a right to a living wage [under which would be subsumed a host of benefits spelled out during the session]; (b) Observer Work should be defined clearly and include a number of key elements; (c) Observers have a right to a safe working environment [this environment accurately delineated]; (d) Observers have a right to be acknowledged for their contribution to science and resource management; (e) Observers have the right to support from their program agencies; (f) Ancillary and additional goals are suggested for inclusion in the Bill of Rights. A number of suggestions arose from the discussions: National protocols should be developed for reporting, inspection, and clearance; decent living conditions on board vessels must be assured; an advisory committee of observers should be selected; regular observer workshops must be established; observer wage levels might be tied to quality; the professional development of observers should be encouraged; accreditation programs need to be set up and offered at appropriate institutions; an examination should be made of the discrepancies between salaries of fish harvesters and observers serving on the same vessel over similar work periods; a study needs to be initiated allowing for comparison between observer programs across all regions, generating such questions as What is the estimated annual value of certain fisheries? Are observers unionized in certain regions? What are effective coverage rates? What defines "a fishing day?"

Ninth Session: The Future of Observer Programs and Workshop Wrap-up

A summary presentation of the Future of Observer Programs was presented, addressing a number of pertinent issues. It was pointed out that program funders will have to be constantly convinced of the program's importance. Deployment on smaller vessels will increase. Cost/Benefit analyses of the program will have to be provided. There must be focus on observer-specific issues such as workload, work-environment and safety. Observers must come to see themselves as professionals and, hence, as part of a profession. Team-building grows increasingly important. Observers must not be solely responsible for resolving conflicts in the industry regarding fishing practices. Insightful comments arose from final discussions: Data gathering must reflect reality; workshops will be more beneficial when there is increased participation between observers and industry. There were many suggestions regarding the venue for the next biennial workshop, ranging from New Zealand and Hawaii to Florida and California. Making the workshop more international was seen as distinctly advisable as was the practice of holding more small group sessions. Evaluation forms could provide valuable feedback for improving future workshops, as well as 2-year tracking of the changes taking place in observer programs. Sincere commendation for the work of the hosts and the steering committee concluded the Second Biennial Canada-U.S. Fisheries Observer Workshop.

Commonly Used Abbreviations

| | |
|---------------|--|
| ADF&G | Alaska Department of Fish and Game |
| AFSC | Alaska Fisheries Science Center |
| APO | Association of Professional Observers |
| BC | British Columbia |
| CARICOM | Caribbean Community |
| CDQ | Community Development Quota |
| DFO | Department of Fisheries and Oceans |
| EEZ | Exclusive Economic Zone |
| ESA | Endangered Species Act |
| FMP | Fishery Management Plan |
| IFQ | Individual Fishery Quota |
| INIDEP | National Fisheries Research and Development Institute |
| IPHC | International Pacific Halibut Commission |
| IVQ | Individual Vessel Quotas |
| MMPA | Marine Mammal Protection Act |
| M-SFCMA | Magnuson-Stevens Fisheries Conservation and Management Act |
| NAFO | North Atlantic Fishery Organization |
| NEFSC | Northeast Fisheries Science Center |
| NMFS | National Marine Fisheries Service |
| NPFMC | North Pacific Fishery Management Council |
| NPFRP | North Pacific Fisheries Research Plan |
| NRC | National Research Council |
| OSP | Optimum Sustainable Population |
| OTC | North Pacific Observer Training Center |
| OY | Optimum Yield |
| PBR | Potential Biological Removal |
| RDG | Regional Director General |
| SEFSC | Southeast Fisheries Science Center |
| SFA | Sustainable Fisheries Act |
| TAC | Total Allowable Catch |
| U.S. | United States |



DAY ONE

“Observer programs must open the process to include all stakeholders, creating partnerships and working toward innovative cost-recovery mechanisms.”

The proceedings of the *Second Biennial Canada-United States Fisheries Observer Program* officially opened at 8:45 a.m. on Tuesday, June 27, 2000 at the Conference Center of the Delta St. John's in St. John's, Newfoundland.

Welcome. *Ben Rogers* of the Canadian Federal Department of Fisheries and Oceans (DFO) was Chairperson of the proceedings and welcomed all delegates to the Workshop on behalf of the Steering Committee: Brian Donahue, Victoria Cornish, David Kulka, James Nance, Teresa Turk and Ben Rogers. After opening remarks regarding the Workshop Program and directions regarding procedures and housekeeping duties, Mr. Rogers invited Victoria Cornish, National Marine Fisheries Service, to present an overview of the United States Observer Program.

THE U.S. OBSERVER PROGRAM

Ms. Victoria Cornish, NMFS, Office of Science and Technology, National Observer Program, began her presentation with a review of the early days of the NMFS Observer Program and its origins in the foreign and ETP purse seine fisheries in the 1970s. The emphasis shifted, she said, to a domestic observer program in the 1980s with NMFS regional staff developing programs independently to meet scientific and management needs. The program's current profile stresses by-catch monitoring, catch-estimation, and biological sampling, elements that are funded federally and through industry. Presently, there are over 500 observers who are either contracted or federally employed and deployed in over 18 fish-

eries. The levels of coverage are generally low — less than 20% — with the exception of the North Pacific.

The Need for Fisheries Observers. Observers provide high-quality data, both environmental and socio-economic, for fisheries science and management. They monitor compliance with fisheries regulations and other environmental laws. As well, they provide a means for verifying the data collected from other sources such as logbooks and landing reports.

The Work of Observers. Observers provide data on species-composition of catch and by-catch, estimates of gear, vessel and gear characteristics, fishing locations, biological samples, and environmental parameters. In conjunction with these data collections, observers represent NMFS to fishermen and serve as a sounding board for their concerns. They assist in NMFS research projects, collecting biological samples for stock assessments and genetic studies, tagging of released animals and assisting in research activities between deployments.

The Authority to Place Observers. The requisite authority for NMFS to place fisheries observers within the fishing industry derives from three major Acts:

- **Marine Mammal Protection Act (MMPA).** Observer coverage is focused on fisheries that have a frequent or occasional take of marine mammals with jurisdiction existing over state and federal fisheries. The observer program currently operates in over nine of the 25

Category I and II fisheries, with consistent coverage for the former and rotating coverage for the latter.

- **Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA).** This Act provides jurisdiction over those fisheries operating in federal waters, i.e. between 3 and 200 miles from shore. The coverage is limited, focusing on the monitoring of total catch, finfish by-catch, and scientific data collection. This coverage extends to 9 of the 50+ fisheries that are managed.
- **Endangered Species Act (ESA).** Under this Act, Section 7 consultations are required on all federal actions that might impact endangered species. Fishery management activities may require monitoring as part of an Incidental Take Statement authorized under Section 7. Consultation is within NMFS for endangered sea turtles and marine mammals or with the U.S. Fish and Wildlife Service for endangered sea birds.

Ms. Cornish outlined the various fisheries that presently have observer coverage: Atlantic Ocean and Gulf of Mexico (*New England Sink Gillnet, mid-water trawl, mid-Atlantic coastal gillnet, South Atlantic shark driftnet, Atlantic Pelagic longline, shrimp trawl, and shark bottom longline*); Pacific Ocean and West Pacific (*Pacific Whiting Trawl, Swordfish and Thresher Shark drift gillnet, Monterey Bay Halibut Setnet, and Hawaii Swordfish and Tuna longline*); Alaska and North Pacific (*Bering Sea groundfish trawl, Pacific Cod longline, Aleutian Islands groundfish trawl, Cook Inlet salmon setnet and driftnet*).

The National Observer Program. This program was established by NMFS in March 1999 to address observer program issues of national importance. The program operates out of NMFS Headquarters in the Office of Science and Technology, Fisheries Statistics and Economics division.

- **Mission.** To provide a formalized mechanism for NMFS to address observer issues of national importance and to develop policies and procedures to ensure that NMFS observers and observer programs are fully supported.
- **Objectives.** (a) To develop national standards and policies to improve the quality of data collected. (b) To advocate for better funding and support. (c) To improve communication and outreach.
- **Advisory Team.** The team comprises NMFS staff from each region and each headquarters office who meet quarterly to identify issues of national concern. Members represent NMFS and their respective offices on program issues, recommending or establishing priorities for national research and problem solving. The team also supports information collection and program implementation.
- **Activities.** The work of the National Observer Program includes budget initiatives to expand coverage, reauthorization of MSFCMA and MMPA, and reviews and evaluations of existing programs with respect to cost efficiency, effectiveness, and coverage levels. The Program is also looking to establish standards for insurance, data confidentiality, hiring, training, safety and contracting. Efforts are being undertaken to modernize data collection techniques, to support observers' needs, to educate constituents and the public, and to integrate observer data with other programs.

Ms. Cornish concluded her presentation with recommendations regarding the future of NMFS Observer Programs. The NMFS Observer Program, she stated, must open the process to include all stakeholders. It must create partnerships with states and other federal agencies to meet common data needs; it should provide for a timely and widespread dissemination of observer data to fishermen and the public; it must work toward creative cost recovery mechanisms and the development of standards and policies that enhance effectiveness and cut costs.

THE CANADIAN OBSERVER PROGRAM

Brian Donahue, DFO Ottawa, presented to the assembly a comprehensive overview of the Canadian Observer Program, focusing on its history, regulatory framework, structure, and objectives.

- **The History.** Canada implemented its Observer Program 23 years ago in 1977 with the introduction of the 200 mile-limit EEZ. The program was initially designed for foreign vessels fishing in the Canadian zone that, by 1987, mandated 100% coverage. Meanwhile, in 1980 the Domestic Observer Program had been established with enforcement, scientific and management elements. Mr. Donahue pointed out that at the present time all major Canadian fisheries utilize observers as part of the total management scheme.
 - **The Regulatory Framework.** The authority of the program derives from the regulations and requirements of the Department of Fisheries and Oceans which is charged with the responsibility of overseeing and protecting the nation's ocean resources. The designation of what constitutes at-sea observers, their duties and their rights has been developed, refined, and, hence, has evolved over the 23-year life of the program.
 - **The Program.** The Canadian Observer Program is an integral component of DFO conservation and protection, science, and fisheries management initiatives. The Conservation and Protection Directorate in Ottawa provides the national focus. Coordination occurs on a Regional Program basis with program delivery contracted to the private sector.
 - **National Responsibility.** The national focus includes the development of overall policy and program coordination. The Directorate provides the legislative framework, program and contract authority along with a national budget, all under the aegis of the Government-Industry Program Management Committee (PMC).
 - **Regional Responsibility.** The regions oversee the day-to-day operations. They assist the contractor with observer training, see to the strategic deployment of observers, establish PMC working groups, and are responsible for program administration.
 - **Program Operations.** At present, 20,000 observer sea-days are achieved annually. DFO and the fishing industry share the cost of the program. DFO pays administration charges, with industry funding the observer deployment and associated costs. Both operate under a Government-Industry Program Management Committee.
 - **The Contract.** Contracts for program delivery are based on a competitive, open-bidding process under a Request for Proposals protocol. Independent technical and cost evaluations are conducted through a National Contract and Project Authority. Currently, the program functions with five DFO Regional Operations and Administration headquarters.
- Mr. Donahue explained, in considerable detail, the fundamental *objectives* of the program:
- **Compliance.** To ensure compliance, as part of its enforcement mandate, DFO provides Fishery Officers who operate on patrol vessels and ensure aerial surveillance and satellite tracking, along with at-sea observers. These activities and accompanying personnel help determine compliance with the regulations and provisions of Fisheries Management Plans through the monitoring of catch composition including prohibited species and by-catch, the maintenance of small fish protocols, the recording of areas of capture, and ensuring adherence to gear restrictions.
 - **Science.** The Program provides invaluable fisheries science data to help determine stock assessment. Scientific sampling is conducted to assess the dynamics of fisheries distribution. By-catch and discards are carefully

monitored and fishing efforts and catch are quantified, all contributing to ensuring a sound approach to Oceans Ecology.

- **Management.** Under its fisheries management responsibilities, the Program determines the opening and closing of fisheries and relevant individual vessel quotas (IVQs). It estimates catches and discards, undertakes gear selectivity studies and the development of fishing plans. The program also establishes and vigilantly monitors marine-protected areas and endangered species.

UNITED STATES PROGRAM REVIEW

Following the U.S. and Canadian overviews of Observer Programs, recent and current efforts to review NMFS observer program operations was presented by Dennis Hansford, Graeme Parkes and Dan Ito.

Management Control and Service Delivery Models: Review of National Marine Fisheries Service Observer Programs

Dennis Hansford, NMFS Office of Science and Technology, National Observer Program, outlined the meaning and purpose of management controls. He defined the controls as safeguards that ensure that plans proceed and resources are used as intended to achieve the best results. These exist to guarantee that obligations and costs are in compliance with applicable law. They also help ensure that funds, property, and other assets are safeguarded against waste, loss, unauthorized use, or misappropriation. They act also as a form of program accountability.

A **Management Control Review** (MCR) is required by U.S. Federal agencies under the Federal Manager's Financial Integrity Act (1982) and provides much of the support for the agencies' end-of-year statement to the Secretary of Commerce on internal control. The MCR assists in identifying excess controls and assures that administrative, financial and programmatic risks have been adequately addressed. If weaknesses

exist, the MCR should identify them and recommend appropriate actions. The review also provides an opportunity to review and reassess control systems.

The Risks. Mr. Hansford reviewed three Service Delivery Models (SDM) presently in place to carry out control reviews: In House, a Contract to NMFS, and Third Party Contract. Because potential risks were identified with observer programs, it was decided to conduct a Management Control Review on the Observer Programs to determine whether these risks were affected by the various service delivery models in place.

- **Cost Management.** Funds for the program may not be available for obligation consistently and on time. The costs for providing observers may be excessive or misallocated within government and industry.
- **Recruitment, Training and Retention.** Qualified observers may not be recruited and/or retained. As well, observers may not be properly trained to perform their duties.
- **Health and Safety.** The health and safety of observers may be impaired. They may be subject to harassment and verbal abuse.
- **Insurance and Liability.** Insurance coverage and legal remedies for observers who are injured at sea may be inadequate. The classification of seamen and non-seamen has been the subject of much debate. There may be a need for different types of coverage.
- **Data Processing Standards and Methods.** Observer coverage, deployment, and data collection may not be well-coordinated within NMFS or with other Federal, state, or inter-governmental agencies. The completeness and accuracy of observer data may be compromised. There is an apparent conflict of interest when an observer is not clearly attached to the appropriate agency for follow-up.

Mr. Hansford explained that the Management

Control Review process is focusing on specific elements which he defined as “event cycles.” The cycles include staffing and recruitment, training, deployment and logistics, data collection, debriefing, data entry, and editing. The process encompasses these components:

- **Event Cycle Documentation.** The MCR team describes the management controls that are currently employed for each event cycle. The documentation is affected by the service delivery model for each region.
- **Testing.** Each region is tested for the effectiveness of management controls in averting identified risks through observer surveys and by interviews with program managers, vessel owners, and contractors.
- **Analysis of Findings.** Results from the testing phase are analyzed to determine if and where weaknesses are present.
- **Development of Recommendations.** Each region develops recommendations to address where current controls may be inadequate or ineffective. Recommendations must be able to be implemented within the next fiscal year.

Some preliminary findings indicate that 9 out of 12 observers were not provided a health and safety checklist; the majority of observer activities are covered through non-based funded sources; 13 out of 20 vessel owners indicated that they would extend their P & I insurance to cover observers, if reimbursed by NMFS. The MCR process should be completed by the end of the fiscal year, September 30, 2000.

Independent Review of the North Pacific Groundfish Observer Program (NPGOP). *Graeme Parkes*, MRAG Americas, presented the review which he and his colleagues (*Heidi Lovett*, *David Agnew*, *Conor Nolan*) recently completed. Background statistics of the NPGOP revealed that the program collects, maintains and distributes data for scientific management and regulation compliance for fisheries in the 900,000 square mile Exclusive Economic Zone off the coast of

Alaska. 400 NMFS groundfish observers are deployed each year, accounting for 25 to 35 thousand data-collection days on a variety of fishing vessels. The total groundfish fishery in 1998 was 1.9 million metric tonnes with an ex-vessel value of \$385 million. The annual cost of the Observer Program, paid for by the fishing industry, is estimated to be \$8-10 million, with a further \$3 million in Agency costs. The observers are deployed through private observer companies contracted directly by industry under a pay-as-you go system.

Program History. The first placement of observers by NMFS was in 1973 on foreign vessels with the focus of recording by-catch of Pacific halibut. 1976 saw the Americanization of fisheries through the Magnuson Fishery Conservation and Management Act. The era of the “modern observing” began with the Alaska domestic groundfish observer program in 1990. A year later, all foreign fishing within the 200 mile EEZ was terminated, leaving an entirely domestic fishery.

The decision to undertake the Review arose from NMFS concerns that changing demands on the observer program were creating conflicting requirements of observers and reducing the quality of output. There were growing doubts about the third party pay-as-you-go system of financing, along with general disappointment at the failure of attempts to reform the program in the mid 1990s. In August 1999, NMFS initiated a review of the program performance relative to its goals and objectives. The review, conducted by MRAG, included written materials, interviews conducted, meetings and workshops held, and a questionnaire distributed. (Somewhere between 1,300 and 2,000 of these were returned.) Mr. Parkes presented a number of flow diagrams to explain the line responsibilities, functions and operational procedures under the authority of NOAA connecting all the components that link to, among others, the Observer Program Office, observers, observer companies, and industry.

The Review. The extensive review reported on seven major areas of concern, outlining present

practices and problems with possible solutions and accompanying proposals for action :

- **General Issues.** An interim design (third party, pay-as-you-go) remains in place, despite substantial efforts to devise a replacement design acceptable to all stakeholders. NMFS faces difficulties in fulfilling its obligations under the program and the OPO struggles to respond to conflicting scientific, catch accounting and compliance needs. There is, nonetheless, a strong desire within OPO to make the necessary improvements. The Review recommends a coordinated Action Plan for implementation of required improvements.
- **Goals and Objectives.** Program objectives have not yet been formally adopted for the NPGOP as a whole. There is still no clear understanding of the objectives of the program by all stakeholders. Wide consultation must be undertaken to determine common goals and objectives and to examine the cost/benefits of the program.
- **Authorities and Structure.** Currently, industry pays private companies for observer coverage with multiple observer companies competing on a day-to-day basis to provide for multiple industry clients. Conflicts of interest are obvious with threats to data quality and the creation of poor working conditions and disincentives for observers. The day-to-day element of competition needs to be removed with the recommendation of establishing exclusivity in observer supply through competitive bidding and direct contractual agreements between NMFS and observer companies. Where it is not feasible for one small company to operate, the Groundfish fishery should be divided to make it functional for coverage.
- **Coverage Levels.** Since some vessels of 60' to 125' are not required to have observers full-time, NMFS has no means of controlling placements. The non-random sampling of vessels in 30% bracket creates bias and there

is no observer data from vessels less than 60 feet. There is also a shortage of trained observers for some deployments. Perhaps there might be alternatives to using observers for some data collection tasks. Randomized sampling must be achieved and NMFS control over placement should be strengthened. Vessels less than 60 feet must have coverage.

- **Cost Distribution.** There is presently no acceptable alternative to the present system where industry pays under a pay-as-you-go procedure. Hence, there are conflicts of interest and cost inequities. Cost might be distributed over the whole of the fleet which benefits from the program. Discussions should continue to implement possible TAC set-asides and fees, perhaps, based on "all vessel days at sea." The following criteria for a funding mechanism were presented: (a) Provide financial support for current and future observer coverage needs; (b) ensure adequate observer coverage and data quality; (c) guarantee equity of payment to all industry sectors; (d) keep costs of coverage reasonable; and (e) ensure adequate compensation for observers.
- **Support System.** The current third-party Service Delivery Model reduces opportunity for NMFS to provide support for observers. An evaluation system has been developed to provide quality ratings of data and observer performance. Observers are not satisfied with the support system, resulting in a high turnover rate and higher training costs. The observer profession needs support. Evaluation must be improved, possibly with the use of a scoring system. Observer recruitment criteria should be broadened.

Mr. Parkes concluded by reiterating that much has been achieved under the interim system, but it is long overdue for improvements. The Review provides recommendations for those improvements. But a major commitment is required from all stakeholders and there has to be more focus on the observers. It is they who produce the all-important data.

Response to the Review from Alaska Fisheries Science Center (AFSC)

Dan Ito, responding to the MRAG Review, agreed that there was always a need for the Review. The third party “pay-as-you-go” service delivery model was never intended as a permanent program. Attempts at restructuring have failed and a comprehensive review was needed before embarking on another major attempt to redevelop the program. MRAG synthesized many complex issues into a cohesive, perceptive, and understandable report. They are to be commended, Mr. Ito said.

Before the release of the MRAG Review, AFSC had responded to the key recommendations and, of course, concurs with them. The Center has established initiatives to respond to the following:

- **Program Goals and Objectives.** The crux of the problem is the lack of a planning process to establish the goals for NPGOP. That process must be initiated. The issues facing the Council, Agency and observers have changed over the 10-year history of the program. The process must involve all key stakeholders. Priorities must be set and the course stayed.
- **Authority and Structure.** The chief problem is the direct “industry to observer company” relationship. There is day-to-day competition between companies for business with a lack of control and little support for observers. In this dynamic, NMFS is not the client. AFSC suggests that the ideal is a Federal workforce – something not likely to happen. The practical course is to have the Government contracting process established via a statement of work. This procedure would hold the observer company accountable for the quality of the observers and the data provided. Initially, contracts will be “no-cost” and exclusive.
- **Observer Support System.** Mr. Ito stressed that we must not lose sight of the reality that “the observer in the field is the foundation of any successful observer program.” AFSC is

committed to training and supporting its program. An Observer Cadre with NMFS field presence can improve data quality and integrity. Industry outreach will be strengthened and observers and the observer program will be seen as an asset. Critical program functions such as efficient and regular debriefing will be supported.

Mr. Ito concluded by saying that the development of an Action Plan is needed, one which determines priorities of recommendations, fleshes out fully the options, explores contingencies, and establishes milestones and time-lines. This exercise, he said, is not trivial and will likely meet with resistance. It will demand a considerable amount of staff time.

CANADIAN PROGRAM REVIEW

Michael Gardner, *Gardner-Pinfold Consulting Economists*, presented a review of the Canadian Observer Program with respect to design and delivery. Such a review was required as (a) coverage had greatly expanded, (b) industry was now paying despite little input, and (c) contracts presently in place are about to expire in 2000.

Background Information. Mr. Gardner spoke to the major points covered earlier in Brian Donahue’s Overview of the Canadian Observer Program. Pointing out that domestic coverage started in 1980, he explained that the program does indeed cover 35 fleet sectors with coverage varying from 5% to 100%. Over 20,000 sea-days have been delivered at a cost of \$9 million. Presently, industry pays 70% of the deployment costs with DFO administration covering the remaining 30%.

Objectives and Design. The fundamental objectives of the observer program are to monitor compliance, to collect data for fisheries management, and to gather scientific information. The program’s design provides for delivery by a private contractor with regional exclusivity contracted through a competitive bidding process. The program’s structure is straightforward: DFO is responsible for management, the contractor

assures delivery, and industry undertakes to comply with the program's regulations and pay for its delivery.

Concerns. The implementation of any program will generate its own concerns. There must be a clear understanding by all participants of the observer's program rationale and the need for accountability. In this regard, DFO is committed to conduct independent evaluations of the program's rationale and effectiveness, principally because of the real value of compliance in terms of the provision of scientific and management data. A major issue is the cost to industry of program delivery. Mr. Gardner pointed out that while industry pays for a significant share of program costs it has a limited role in its design; at the same time, the decisions on program cost-recovery are rather arbitrary. He recommended that the Program Management Committee (PMC) develop principles governing conditions under which programs are to be subject to cost recovery.

Of equal concern is the integrity of the program. Mr. Gardner asked whether consideration should be given to shifting to a multi-supplier model that would reduce costs but might, at the same time, compromise integrity. He recommended, however, that program delivery be continued through single contractors in each DFO region.

He outlined six other issues with a recommendation regarding each:

- **Cost.** Presently, the costs to industry are too high with day rates higher than they need to be and contract structures requiring too much travel. He recommended that PMC ensure the bidding process is competitive, that PMC reviews be the basis for setting day-rates, and that industry be allowed to accept the lower cost option.
- **Technology.** There is no incentive to develop and adopt technology-based methods. He recommended exploring the feasibility of technological solutions to replace or complement observers.

- **Coverage.** It appears that coverage and coverage levels are arbitrary and not linked directly to objectives. The PMC must develop clear principles governing the need for the levels of coverage on a fleet-by-fleet basis.
- **Deployment.** Present deployments seem to lack a strategic basis and are often wasted. DFO should allocate sufficient resources to management to develop and implement strategic deployment plans.
- **Data Usage and Quality.** Mr. Gardner believes that data gathered through the program is not effectively used and recommended that DFO allocate adequate resources to ensure that data are used to further the program objectives. Likewise, because of the high turnover rate, the program has fewer qualified observers. As a result, the collected data is of doubtful quality because of coverage and deployment issues. There has to be a careful assessment of the actual impact of the turnover rate on the quality of collected data. And the coverage and deployment issues must be addressed.

Mr. Gardner concluded the review of the Canadian Observer Program by addressing some fundamental concerns of both the contractor and the observer. From the viewpoint of the contractor, the objectives are not clearly stated, coverage targets are not met, and the operational management is often a "nightmare." Because of weak coordination within DFO, the Department often appears unable to use the data effectively. While the data are of high quality, they are, paradoxically, of questionable value. Contractors are faced with high recruitment and training costs.

For the observers, gaining professional status is important. They believe that the high turnover rates are due to inadequate income and poor working conditions with tasks being much more difficult on smaller vessels. While not helping vessel crews can create resentment, harassment is not pervasive, though the treatment of females is still problematic.

First Session

Panel Discussion: General Industry Issues

“Overestimating by-catch rates hurts the fisherman; underestimating hurts the fish and the fisherman.”

Moderator

Michael Gardner, GP Consulting Economists Ltd.

Panelists

Nelson Beideman, Blue Waters Fishing Association

Caroline Gibson, Pacific Marine Conservation Council

David Foster, Fishery Products International

Lionel Rowe, Fisheries Consultant

Pete Aparicio, Gulf of Mexico Fishery Management Council

John Boland, Fish Food and Allied Workers

The Workshop had established a wide range of issues to be discussed by the morning panel: Data usage and confidentiality, standardizing industry feedback mechanisms, program delivery, fishery sector involvement in program design, and coverage level determinations.

Observer Coverage. *Nelson Beideman*, Executive Director of the Blue Water Fishermen’s Association, indicated that his organization has always supported observer coverage to document the realities of highly migratory species; however, problems have arisen with respect to their obtaining appropriate data. His summary included four major points:

1. The pelagic longline fishery for swordfish and tuna is conducted along distinct water edges that are primarily a function of current changes between different bodies of water, and fishermen use surface temperatures to follow these edges. Along these edges are different strata of targeted catch and by-catch. He pointed out that extrapolating data to a boat alongside the observed boat does not reflect reality because that boat is fishing

a different stratum of water even though it is in the same area. This method of extrapolation should not be used for management decisions. A more realistic approach would be to apply the observed catches – by area and temperature - to those sets in front of and behind the observed vessel.

2. To limit reporting and observer coverage to only one sector of an overall fishery is tantamount “to turning up the lens of a microscope to discriminate against one small group.” Such practices, he said, place a “bull’s-eye” on the cooperating fishermen. **Fishermen can no longer support observer coverage that is limited to one sector of a much larger fishery.**
3. The observer program is a stressful imposition of the government upon hard-working and independent fishermen. Observers must be cognizant of the “personal factor” and the part it plays in doing effective work; they must understand the perspective of their host and employ common sense. Rested observers will not win any points with “sleep-deprived” crewmembers; pitching in helps the atmosphere of the boat. The term “surveillance,” Mr. Beideman argued, has no place alongside the terms “research” and “science.”
4. On a positive note, he informed delegates that Dr. John Hoey’s Captain’s Report was the type of document that can be most helpful. That report showed “both clean and dirty laundry” and makes practical suggestions for avoiding unwanted by-catch in each area of the fishery. Working together, Mr. Beideman concluded, can help resolve problems and help maintain a viable fishery.

Caroline Gibson of the Pacific Marine Conservation Council (PMCC) underscored the fact that her organization supports statistically reliable levels of observer coverage on all fleets (including charter boats) and the maintaining of mandatory logbooks. Responding to her own question *Why do we need an observer program on the West Coast?*, she said, “We don’t know how much fish is caught!” There is a real need for information on total catch rates and mortalities – data that cannot be determined from landings alone. She pointed out that basic life-history data is not available for most of the 83 federally-managed groundfish species.

Ms. Gibson reminded the Workshop participants that for over twenty years on the Pacific Coast attention has been focused on salmon while largely ignoring groundfish. Hence, the majority of groundfish under the Fisheries Management Plan (FMP) have never had a stock assessment done to determine stock bio-mass. As a result, a groundfish disaster was declared in January of this year by the United States Department of Commerce.

Fishermen, scientists and conservationists know that many species are in decline, yet they do not have the supporting data. Managers, she said, are being required to make decisions “based on the best scientific information available.” It is obvious that monitoring of species listed as “over-fished” and “approaching over-fished” is absolutely necessary.

The Difficulties. Ms. Gibson indicated that a large number of vessels are catching groundfish in Washington, Oregon and California: Trawl (274), Longline (202), Trap/Pot (32), Open Access (1500). Most fisheries are year-round operations with over 30 ports spread between Bellingham, WA and San Diego, CA, making for a hugely expensive observer program. West Coast fleets are in economic distress. There is a real dilemma: overestimating by-catch rates hurts the fishermen; underestimating by-catch rates hurts the fish *and* the fishermen.

The Solution. Ms. Gibson suggests the follow-

ing action: (a) A coast-wide pilot program should be undertaken now to work out the problems associated with a full observer program; (b) The industry must establish a mandatory, comprehensive, statistically reliable observer program that covers all fleets. High quality observers with good training must be provided and vessel owners and crew must be offered feedback in the form of an annual observers’ report.

The Funding. Three elements of funding might be considered: (a) Short-term – Public funds could be used to jumpstart the observer program along with other funding sources (e.g. private or industry), phased in over a 3-year period; (b) Long-term – fleet participation should be at least matched by public investment with public investment covering 50% of the cost; (c) all such funding should be done three years in advance.

Fishing Company View. *David Foster* of *Fishery Products International* (FPI) spoke about his company’s participation in observer programs. FPI presently employs 19 wetfish ships and one factory freezer vessel in its operations, and it fully supports the observer program. He pointed out that its observer program usage is 100% in both the Northern Shrimp fishery and the NAFO-managed groundfishery. As well, there is very high coverage in the company’s remaining fishery activities. In the area of data collection and usage, FPI carefully complies with the requirements to ensure data collection regarding gear measurement, location of the fishery, catch quantities, size and species, and the company maintains its no discard policy. It is sensitive to the need for confidentiality in the process. Mr. Foster said that FPI is committed to program delivery, assisting in the enforcement process, providing additional information where needed, recording accurate statistics on size, sex and otoliths. The company strives to maintain consistent levels of coverage and ensures that the certification procedures are open to others.

The View From The Gulf of Mexico. *Pete Aparicio* of the Gulf of Mexico Fishery Management Council spoke on behalf of the

Council and the issues important to his region. The most contentious and divisive issue facing the Gulf of Mexico Council, according to Mr. Aparicio, is the shrimp trawl by-catch of juvenile red snapper. Until recently, not much observer data was available – and that which was did not convince the industry as to its accuracy and usefulness. Part of the problem was that the protocol for the testing of by-catch reduction devices required too many sets or drags, resulting in loss of time and effort. (The protocol is changing so results should improve.)

Mr. Aparicio believes that solutions to a number of the issues discussed in the morning's panel could be addressed by employing a method described by Peter Cassels from the Australian Fisheries Management Authority (*cited in the minutes of the NMFS Observer Programs held in Galveston Texas, November 1993*). Cassels explained how the Australian Observer Program moved from being a purely Government program to one directed by a board made up of representatives from the fishing industry, science sectors and the government. The inclusion of contractors and industry allows for valuable insights.

Another observation made by Mr. Aparicio spoke to the risk liability that vessel owners bear when carrying observers on board. A personal anecdote referred to a vessel owner from his family being sued by an observer for over \$950,000 because of an alleged back injury. He noted, as well, that the matter of communications was a growing difficulty in the Western Gulf region because of the inability of so many crewmembers to speak English.

John Boland, *Fish, Food and Allied Workers*, stated that it must be made clear to all the stake-

holders in the observer program what it is precisely each wants the program to achieve. Unless the participants in the observer program are accountable to each other, he believes the program will never be truly effective. Formerly, the program was 100% government-funded; today, industry accounts for 72% of the costs with government paying the remaining 28%. In many ways, he said, the industry is “at the mercy” of the government which “calls the shots” on what data is to be collected and how it is to be interpreted and used. He questioned whether we were not simply using the observers for “optics and political purposes.” He felt that the enforcement element of the program has limited effectiveness. Owners who want to cheat, he said, will do so. Vessels do not stop breaking rules, they just change their tactics.

Essentially, the observer program will only work when those who pay for it have more input and influence on how it is conducted. He stressed that the data gathered by observers should be used primarily for science and research. Citing the dockside monitoring program (98% of which is paid for by industry and management) presently in place in Newfoundland, Mr. Boland wondered why multiple monitors would be employed. It doesn't make sense, he said, if the goal is primarily scientific research.

We have to realize that in our system, the Government designs and mandates the program, the contractor carries it out, and industry is effectively left out. He pointed out that the observer's job must be clearly identified not only to the observer but to all those on board the boat. He concluded that observers do play a vital role in the fisheries but that role and the program itself must change to meet current realities.

Second Session

Panel Discussion: Current and Future Observer Programs' Funding Mechanisms

“Observer programs don’t get funded; what gets funded is the value of the management package or research programs.”

Moderator

John Gauvin, *Ground fish Forum (North Pacific Groundfish Fishery)*

Panelists

Tom Jamir, *Gulf and South Atlantic Fish Foundation*

Rita Curtis, *NMFS Economist*

Gary Dedrick, *Canadian Council of Professional Fish Harvesters*

Lynne Phipps, *NOAA Procurement*

John Chouinard, *DFO Program Manager*

Moderator **John Gauvin** in his overview to this session noted the issue of funding mechanisms for Observer Programs is not only overdue for improvements, it is at a crossroads. There must be clear identification of objectives, he said, as well as a determination of who pays for the carrying out of these objectives. Greater observer coverage is the key to the future of the industry. In the North Pacific Groundfish fishery there is 100% observer coverage with about 60% of the totals sampled. The vessel costs for the program are \$300 a day for about 200 days. Mr. Gauvin raised the question of the potential conflict of interest between the objectives of science and enforcement, pointing out as well the Government-versus-Industry funding issue.

Dr. Tom Jamir of the Gulf and South Atlantic Fisheries Foundation presented an outline of factors that influence funding of fishery observer programs. He offered the following “tips” for soliciting observer funding: (a) Assure credibility (the *Trust* factor) of observer/research program; (b) capture the benefits to the donor, i.e. *What is your value proposition?*; (c) break down the price or cost into “bite-size” pieces; and (d) weigh in the risks to the donors.

Dr. Jamir presented parallel five-step sequences which lead to financial support/customer patronage:

- Prevailing world view or paradigm (*Corporate image or philosophy*) will determine...
- Fishery management strategies and policy objectives (*Corporate Strategies and policy objectives*) will then determine...
- Research, monitoring and enforcement programs (*Type of business or product/service offering*) will next determine...
- Data requirements and collection methods (*Production, marketing and sales*) will finally determine...
- Funding mechanisms or financial support (*Consume,. Customer purchases/patronage*)

Observations were offered by Dr. Jamir on each of the five elements of the sequence:

- (a) The prevailing **world view** is shaped by perceptions about the resource among fishers, managers and other stakeholders.
- (b) **Fishery management strategies** follow from these factors: 1. Human (*the degree of mutual trust*) 2. Economic (*industry structure and value proposition*) 3. Nature of the resource (*open access, common property or ownership*) 4. External (*overarching goals*).
- (c) **Research and monitoring programs** are influenced by prevailing research paradigms, models and tools. Dr. Jamir defined “paradigm” as a set of assumptions, methods and model problems that define for the scientific community what the important questions are

and how to go about answering them.

- (d) With respect to **funding mechanisms**, he observed that “Observer programs don’t get funding; what gets funded is the value of the management package or research programs.”

Dr. Jamir suggested that a noteworthy resource for the issue was the publication *Paying for Sustainable Environmental Systems: A Guidebook of Financial Tools*. This free resource is made available from EPA/ Environmental Financial Advisory Board (April 1999). It outlines approximately 340 financial tools useful in paying sustainable environmental systems. (Interested participants can consult the website: <http://www.epa.gov/efinpage/guidbk98/index>.) *Rita Curtis*, NMFS Economist, spoke of the economics of observer program funding mechanisms by examining the pros and cons of five potential funding sources and raising questions about each:

- **Government.** The advantages are that there would be widespread benefits for the resource, indicating a national support for resource stewardship. There would be a progressive tax system that was simple and transparent, and such government funding would not disrupt the market unduly. Against this would be the introduction of localized benefits from nationalized costs. Ultimately, taxpayers would be underwriting. If the government paid, would the taxpayers receive utility from seafood consumption and recreational fishery? Are there values in having a healthy resource and protecting endangered species? The answers to the questions appear to be positive, particularly with the public being confident the product is safe and species are being protected, as well as their having access to public information and research on the fish products.
- **Industry.** With the industry paying, the *pros* are that it is the primary user and source of “damages,” and the equity and incentive issues are often overstated. The *cons* are that the industry is not the sole source of resource

problems, given that other pollutants or factors affect stocks. Also, the equity and incentive issues become significant. There is a danger of market distortion, in which case the consumer loses because of potentially higher prices. Fishery heterogeneity often causes high administrative costs. The payers in this scenario are the industry, seafood consumer, and taxpayers. As to the economics of this setting, who pays will ultimately depend on demand curves and consumer preferences. In examining the equity of payment structure, it would appear that a flat rate would be regressive. Is it fair to make some in the industry pay more? Some fishers control 80% of certain stocks and are well-off. Under this paradigm, industry may create both short and long-run incentives to influence reporting – and observer job security must be independent of reporting.

- **TAC Set Asides.** The advantages in this scenario are that there would be little or no negative impact on the market; a potential positive impact in the market might be an increased season length, and therefore, price benefits. As well, catches harvested by the most efficient producers increase return to the resource. The disadvantages are that this system requires binding fishery TACs and economic rents being earned in the fishery. There would possibly be a potential uncertainty with respect to observer funding. In TAC Set Asides, the most efficient producers are internalizing costs with consumers not paying extra. The increases return to the resource, a net gain to society.
- **Seafood Tax.** Such a tax would establish a broad base to share cost and would only apply to those making “demands” on the resource. The negatives are that the program would have to consider the export/import question, and it would be difficult to implement legislatively. What might be fine on the local or state level might not work nationally. As to *who pays*? It would appear that it would be the industry if the seafood demand were perfectly elastic.

- **Seafood Label.** The advantages here is a more-targeted structure for cost sharing with consequent self-identification of resource concerns. A market-based system would defray fishermen's costs. This approach has the potential to encourage a certain type of consumer who is eco-friendly. Contrasting with it would be the fact that the NMFS would need to work with industry, retailers and NGOs to establish labeling systems. As well, NMFS needs to conduct surveys to estimate the benefits: Are consumers really willing to pay more? Added to this is the fact that newly-emerging labeling tends to be too bureaucratic and is often not realistic nor current. In this system, high-end consumers pay but also benefit which might be a potential net gain for society.

Gary Dedrick introduced himself as wearing a number of hats at the Workshop. He was there formally as a representative of the Canadian Council of Professional Fish Harvesters, but he is also a longliner operator, president of a Fixed Gear Group of fish harvesters and President of the Eastern Fishermen's Federation. Mr. Dedrick acknowledged at the outset that he was not addressing the funding question; his observations were, he said, more basic. He believes that the costs and poor design of the Observer Program is forcing many small operators out of the fishery. The substance of his commentary included the following:

- **One Size Fits All** approach does not work. What suits larger boats and fleets will not suit smaller operators. The observer costs for a 4-day trip are prohibitive (\$1,500) where the gross for the boat's operation might be \$7,000. As well, there are lay-over days because of weather, and standby rates for observers are still accruing.
- **100% Coverage is Inefficient**, as well as costly for small operators. He cited the case in B.C. of having 100 boats in a fleet requiring 100% coverage with 100 observers, if they were to fish on the same day. But since

for the most part not all boats fish all the time there are often a lot of observers not working – leading to a high turnover rate of observers who are not getting enough work. Hence, new hiring and new training, and delays.

- **High Turnover Results in Lower Quality.** Inexperienced observers have difficulty identifying different species, estimating weights and recording sound data. As well, too many observers use the programs as a springboard into DFO enforcement.
- **On-board Space is a Problem.** How does one accommodate observers on small boats? Vessels are already being downsized to fit reduced allocations. Who is left off to accommodate a required observer?
- **Safety is a Concern.** Captains often “push” the weather and fish when they should more prudently *not* fish. They have an observer on board and are reluctant to waste money on lay-days and steaming-time.
- **Lack of Faith in the Program.** Sometimes, disrespect is the order of the day. It is hard for a Captain to justify to his crew who are making \$100 a day that an observer is paid \$300 to “watch someone work.” When you factor in the inefficiencies and attitudes of some of the observers, you have the ingredients for conflict.

Mr. Dedrick emphasized the point that implementing for a small fleet a program designed around a large fleet is fundamentally unworkable. Fish harvesters view the program as another user fee and a form to take many people out of the fishery. Observer- fees of \$350 a day will not impact a big operation, nor will that operation have real space problems, nor will weather conditions be a major concern. He concluded by saying that unless the core problems of the Observer Program are addressed, the funding problems will not be resolved.

Lynne Phipps of the Eastern Administrative Support Center/NOAA indicated that her region

(Norfolk, VA) is also facing another under-funded fishery. She presented an anecdotal report on their situation: When NMFS passed regulations to allow fishing in closed scallop areas, they also included the requirement for the vessels to carry an observer. Although a domestic fishery, it is similar to the foreign fishing program in that observer coverage is not funded by NMFS. As a result, in 1999, her organization placed a no-cost contract with the National Fish and Wildlife Service (NFWF) for services to manage the funds collected from scallop vessels. NFWF paid the expenses for observer coverage. However, this year a new no-cost contract was awarded that requires the contractor to collect the funds for observer expenses, provide training, deploy observers, accomplish data entries, and provide all equipment and supplies for observers. Observer expenses are to be paid for by the scallop vessels' owners that have a permit to fish in the exempted area. NMFS selects which vessels are to carry observers. If an observer is not available, the vessel can obtain a waiver. The incentive to take an observer is that boats with observers are allowed to exceed their quotas by 200 pounds. (At \$6.50 per pound for scallop, the math is simple: a boat can make an extra \$730.00). Ms. Phipps indicated that the acquisition community welcomes any innovative ideas and suggestions which can assist in the funding of the observer program.

John Chouinard is the Director of Conservation & Protection for the Laurentian Region of DFO. He began with a presentation of basic principles: (a) Fishery activity followed by the at-sea observer is an essential element and a first level component of the conservation and surveillance plans of the at-sea fishery activities; (b) an at-sea program by observers must be in place and operational before the opening of any fishery.

The Laurentian Region fishery, like all regions, has observer requirements for the following fisheries: Crab, shrimp, scallop, groundfish, tuna, sentinel and exploratory programs. With respect to cost recovery, there is a number of elements to remember for the setting phase of the program: (a) Industry support is crucial, certainly as part of an advisory committee; (b) the great majority of fishers have concluded agreements (on a collective basis or individually) with the observer program; (c) no agreement will be guaranteed for a certain number of fishers, even if one considers the group a weak minority; (d) there will always be the appearance of discrimination since some fishers will not have made an agreement; (e) there is no legal support for cost recovery; (f) there is pressure placed on DFO by fishers who have paid for the program because of those who have not; (g) there will be constant difficulty on vessels who have not concluded agreements with an observers' company.



DAY TWO Third Session

Panel Discussion: Observer Safety

“No data gathering by observers is important enough to have someone seriously injured or die.”

Moderator

Shawn Stebbins, Archipelago Marine Research Limited

Panelists

J. Arcenaux, U.S. Observer

David Benson, Canadian Observer

Mike Tork, NMFS Program Manager

Hugh Parker, DFO Program Manager

Chris Woodley, U.S. Coast Guard

Panel Moderator, **Shawn Stebbins**, gave an overview of and background to Observer Safety to set the stage for the panel discussion that followed. He pointed out that commercial fishing is an inherently dangerous occupation with vessels sometimes sinking under routine conditions. Hence, observers are exposed to the same risks as fishermen. Yet, there is a growing concern about resource conservation and therefore observer programs have likewise grown as an important management tool with focus placed on management, compliance and science. Those responsible for the design of observer programs often do not include representation from employers or observers. Observer safety often takes a back seat to operational procedures and complacency can set in. Program Managers must keep safety at the forefront, establishing clear standards for safety.

Who is responsible for observer safety? The equation, Mr. Stebbins said, involves many parties:

- **The Observer** must assess the safety of the vessel, practice safety, pursue professional safety training, maintain personal safety equipment, and make safe choices regarding where, when and how to perform duties.
- **The Employer** provides training and equipment, communicates procedures, deploys the procedures, assesses the vessel/skipper/crew, establishes a process for avoiding unsafe situations, and provides for support systems.
- **Vessel Safety Regulatory Agencies** should develop thorough and appropriate vessel safety regulations, enforce those regulations and set up a process for addressing problem vessels.
- **Fishery Management Agencies** have to address vessel safety when planning new programs, coordinate with other government agencies, consult with industry, provide support for observers, and have a proactive approach to unsafe vessels.
- **The Vessel** is responsible for ensuring safety equipment, its maintenance and compliance with safety regulations; it must also see to it that skipper and crew follow the same protocols.

Mr. Stebbins concluded by reminding the panel that its objectives for the Workshop should be to provide a “report card” on the current situation, identify the common problems, discuss actions to

address problem areas, and communicate its suggestions to the appropriate agencies.

Joe Arcenaux, U.S. Observer representative, addressed the concerns of observer safety, saying that any fishery observer program should include live demonstrations and test runs. Where vessel size may affect its suitability as an observer platform, observing from alternate platforms may be an option.

Observers should be aware of and know how to use communications systems. Communications channels between Search and Rescue and the observer office should be established and clarified. There are many examples where observer's communications skills were a "saving grace" in vessel emergency. Matters like unsafe platforms, seaworthiness and general safety should be handled by the vessel safety office.

Safety standards need not be "more stringent," Mr. Arcenaux said; if a vessel is unsafe for an observer, it is unsafe for the crew as well. When a fish harvester chooses the fishery, he (like any observer) is assuming an inherent risk. Meanwhile, observers should be aware of the fact that not all on-board injuries will be covered – particularly if the activity is not part of observer-duties. When cases are not resolved to the benefit of observers, the recruitment for and maintenance of observer programs is made much more difficult.

Mr. Arcenaux stated that when it comes to defining a "safe vessel," the experience of the observer plays an important role – assuming the vessel has passed inspection by the marine safety office. At the same time, a properly licensed and experienced captain running an observed vessel is very important. It is well to remember that experience in one fishery does not necessarily translate into another fishery.

David Benson, Canadian Fisheries Observer, began by reminding delegates that safety is far more than a cliché in the Newfoundland region where even small craft warnings are not issued by the Coast Guard. It is understood by all mariners that such conditions exist all the time. Wind and wave conditions are always present and fog, ice and freezing spray persist. He cited cases of vessels

"going down" with observers striving to save their paperwork, the "near misses" which observers have faced. Many have worked on foreign vessels, subject to their living conditions and their questionable safety regimes.

So-called inshore vessels, Mr. Benson pointed out, are being forced farther out to sea, undertaking limits beyond their capabilities. He wondered how DFO could justify licensing them to do so when it also determines safety regulations.

He also questioned what he called the "magical absurdity" of the 65-foot vessel regulation. Such vessels have to travel greater distances, carry more fuel, and hold larger amounts of fish to make them paying propositions. Hence, boats are being built deeper, with questionable beam ratios, and are turning into oblong boxes requiring boom stabilizers. He contended that "any boat that needs stabilizers is not a stable boat."

Mr. Benson suggested that the change in emphasis to smaller and smaller vessels has resulted in a "chaotic deployment scheme whereby an individual observer seeks out an inshore fishing vessel willing to take him." Then, too, observers are being given only rudimentary training in emergency duties. They must be trained to the fullest extent possible. Observers, he concluded, must have a final say on their own safety.

Chris Woodley, Fishing Vessel Safety Coordinator with the U.S. Coast Guard, spoke about the new 1998 regulations that provided NMFS observers with the authority to refuse boarding a fishing vessel which they determined to be unsafe. With no observer, these vessels could not legally fish. What resulted was a standardizing of policies and the development of a partnership with NMFS observer training programs.

The partnership has three key components:

- **Hazard Identification Training.** The objectives were to train observers to detect missing or expired lifesaving or fire fighting equipment, the absence of safety orientation or emergency drills, and other easily identifiable hazardous conditions.

- **Reporting/Evaluating of Hazardous Conditions.** Because of the possibility of conflicting interpretations of what is safe and unsafe, observers are trained to report immediately safety concerns to multiple parties: their contractor, the NMFD observer program, and the USCG. Mr. Woodley believes that the Coast Guard is the agency best suited to verify unsafe conditions.
- **Sharing of Safety Data.** NMFS guidelines require extensive safety survey to be completed and presented to the Coast Guard on an annual basis. The data is used primarily to identify broader safety trends within the fleet and to develop solutions.
- **Limitations.** The existing regulations do not address vessel integrity or operational issues. Observer contractors are not in an ideal situation to rigorously enforce safety provisions, if only because of competitiveness. They are not anxious to have observers with reputations for being too aggressive about safety. Quite often there is great pressure on observers not to make waves upon arriving on board a vessel.

Despite the shortcomings, Mr. Woodley is convinced that this partnership is a model for a national program, as it effectively addresses the key issues of observer training, prompt problem resolution, and analyses of observer safety concerns.

Michael Tork, Program Manager for NMFS, addressed the need for national consistency regarding observer safety. The fundamental reason is to help ensure observer's safety and well-being. Care must be taken that important components of training are not omitted and that program managers keep safety in the forefront. The majority of injuries and fatalities can be avoided by knowing how to maintain and use basic safety equipment and what to do in emergency situations.

The following, Mr. Tork said, should be included among observer safety considerations:

- 100% compliance with all USCG vessel safety requirements
- Minimum requirements for safety equipment

- Safety logbook
- Safety meetings
- Ability to recognize unsafe vessels
- Program Safety Officer
- Post-cruise safety questionnaires
- Observer competency testing

Minimum safety training requirements should include CPR/First aid, survival suit use and maintenance, EPIRB use, Vessel Safety equipment, Radio skills, General Knowledge of vessel operations.

There needs to be a national policy, Mr. Tork said, but admitted determining who is responsible for establishing such a policy is no easy question. In conclusion, he noted that no data gathering by observers is important enough to have someone seriously injured or die.

Hugh Parker, DFO Program Manager, began by presenting data regarding Scotia-Fundy fisheries vessels and the trend to smaller and more numerous domestic vessels. At present there are 6000 domestic boats with 90% less than 65 feet and 12 foreign boats greater than 100 feet.

Background History. In the 1970s there were over 300 Soviet and Cuban fishing boats in Canadian waters. By 1977, Canada had established its 200-mile limit and foreign effort was decreasing. The next year observers had been deployed on over 50 foreign trawlers; survival suits were issued but there was no formal safety training offered. Ten years later there were 40 foreign boats still fishing in Canadian waters. Russian fishing activity dropped in a major way because of the early stages of the political break-up of the Soviet Union. At the present, there are few foreign boats pursuing the fishery in Canada and those that do are in poor condition.

Mr. Parker identified the parties concerned about observer safety: Observers, Observer Unions, Observer Companies, Department of Transport, DFO, Canadian Coast Guard, along with agencies responsible for science and resource allocation. Not surprisingly, the safety issues focus on observer personal safety equipment, inadequate vessel

safety equipment, unsafe vessels, adequate safety legislation and liability.

The Legal Issues. More attention must be given to the legal ramifications of observer programs and practices. He noted that it is DFO's responsibility when licenses are issued for areas outside a vessel's Department of Transport certification area. In terms of legal implications, safety at sea should be considered before approving any resource management plan or policy. Indeed, existing resource plans and policies should be verified to ensure their effects do not result in unsafe conditions; such policies must also be consistent with relevant Acts and Regulations administered by DOT and relating to safety at sea. Those not consistent with established legal principles must be amended.

COMMENTARY

Not surprisingly, the issues surrounding observer safety generated a host of questions, answers and observations:

- Observers wanted to know "who sets the standards for training?" Program Managers admitted that often the actual standards were not particularly good. Often contractors are responsible for training, but not all training, of course, is focused on safety.
- An observer noted that he had been provided with "survival suits that had no provision for a harness for helicopter rescue." Safety issues become more vital with the use of smaller boats fishing further out to sea.
- With respect to the continued training of observers, it was noted that the observers should play an important role in terms of making the training sessions more efficient and effective. A suggestion was made regarding a regional training centre: it is "ridiculous" to have to teach 2 or 3 people at a time. We cannot wait, said one observer, for the National Observer Program to develop standards and programs. Admiration was expressed for the Northwest efforts, especially for the lines of communication established there.
- It was felt that the Department of Transportation (DOT) should certainly be involved in the entire scheme of things. One commentator said that the present "DOT involvement" can be best understood by its "empty chair" at the workshop.
- It was pointed out that an observer is compelled to face equal perils as a fish harvester: the same icebergs, the same fogbanks. For an observer, there are mental demands as well as physical ones. Often an observer has to make judgement calls without the benefit of support.
- The question was posed: Who bears the cost of keeping the vessel at a standard acceptable to the observer and the crew? Often it will cost up to \$1,000 to get a safety upgrade that will account for the observer on board. Because an observer may be on board only once or twice a year, vessels are not content to drop a crewmember. The resentment is taken out on an observer due to the fact that "the real source, the one who is higher up" in the enforcement chain, is not on board. An observer remarked, "Your job can be lost if you complain!" Said a Newfoundland observer, when it comes to deciding whether or not to go aboard certain vessels, "What is safe for the goose may not be safe for the gander."
- A representative of the U.S. Coast Guard stated that "the Coast Guard cannot make everyone feel safe" because they cannot fix all the issues under their hat." An Alaskan observer said that he had been on 50 vessels with four being well-maintained, but he could not go to the contractor because the boats in question had their Coast Guard stickers. There have to be yearly checks with updates, he insisted. The Coast Guard responded that Congress has refused to pass the appropriate legislation; he was not sure if NMFS has been lobbying on this safety issue. Questions were raised as well regarding regulations governing "flags of state" and observers' duties inside 200 mile EEZ.

Fourth Session

Panel Discussion: Maintaining an Experienced Observer Corps

“While experience is the best teacher in observer programs, attrition is the greatest spendthrift —of time and resources.”

Moderator

Mandy Merklein, Independent Fisheries Consultant, Seattle, WA.

Panelists

Greg Croft, Canadian Observer

Peter Scola, U.S. Observer

Barry Ackerman, DFO Program Manager

Jim Benante, U.S. Program Contractor

Dr. Harry Benson, Canadian Program Contractor – Seawatch

Mandy Merklein, panel moderator, presented an outline of the issues facing the panel:

Why Retain Experienced Observers?

- **Reliability.** Observer programs provide valuable data vital to fisheries management. There must be sufficient confidence in the quantity and quality of the data.
- **Measuring Quality is Difficult.** Debriefing is a form of self-reporting. Only the observer and the fishermen witness the true quality of observer sampling.
- **Quality Data.** Only well-prepared and motivated observers can supply reliable data. It takes time and money to prepare observers to collect good data. Over time observers can develop the experience and expertise.
- **Costs of High Turn-over Rates.** The impact of high turn-over rates among observers is obvious: data quality and reliability suffer, safety liabilities increase, professionalism and good judgement require time to develop, relationships of respect and trust between industry and agency suffer, training costs for new observers increase.

How to Retain Experienced Observers?

- **Hire Observers who will stay on.** Program directors should ask themselves whether observer retention is an important goal of their programs. Time should be taken to determine the type of individual who will best fit the program and then undertake efforts to attract suitable candidates.
- **Keep Experienced Observers in the Program.** Study the incentives which will work: Pay increases and benefits, appropriate work-load, program support, opportunity for career advancement, provision of advanced training, effective acknowledgment of work accomplished, introduction of flexibility and diversity in placements and assignments.

Barry Ackerman, DFO Program Manager, outlined the mandatory qualifications for observers in the Canadian setting: secondary education, satisfactory health, mobility and availability, writing skills, proof of Canadian citizenship or landed immigrant status. He then addressed the matter of what he saw as an observer candidate's *desirable qualifications*:

- Experience in use of navigational aids and fishing gear
- Related maritime experience on board a commercial fishing boat
- Familiarity with major fisheries and fishing methods
- Biological research and/or enforcement training and experience

In the Canadian program, DFO relies on the contractor to carry out the screening process since observers are to be employed by the contract

firm and not government. This recruitment is accomplished chiefly through job postings. Mr. Ackerman believes that the key to the effective recruitment of suitable observers is, what he terms, “the intensive interview” whereby not only are qualifications verified but one has the opportunity to determine the will and capabilities of a candidate to work at sea. Interviewers in the process must be “up front” with the candidates, honest about the expectations and the attitudes that good observers must possess. He stated that most observers are lost after the first trip.

Retaining the Observers. Mr. Ackerman suggested a number of approaches to improve retention:

- **Feedback** to the observers on how they are doing their jobs is critical if they are to believe there is a value to their work.
- **A Committee of Observers and Program Managers** will provide for the airing of concerns and opening up channels of communication.
- **Annual Meeting** of observers, DFO, staff, fish harvesters to critique the program and suggest improvements.
- **Incentives** for improved compensation and benefits.
- **Reasonable expectations** of work levels for observers.

Kim Dietrich, Association of Professional Observers, spoke from her experience with the Alaska Groundfish Observer Program, also as a field coordinator and with the formation and operations of the APO. She stressed that a better outreach program must occur from a variety of sources:

The Agencies

- They must acknowledge and take responsibility for some of the current problems caused by the agencies themselves.

- Observers need a clear and non-conflicting picture of program objectives with the “right” people hired to meet those objectives.
- Regulatory authorities should be used so that observers are confident of getting backup.
- They should share information on the use of data and include observers in the process.
- They must reduce any double standards applied to observers but not to agency staff.
- Training must be improved so industry has confidence in observer data.

The Contractors

- The inherent conflict of contractors having industry as clients should be eliminated.
- In the Alaska program the relationship between agency and contractors has disintegrated and is, in some cases, hostile. Observer morale and confidence are negatively affected.

Outside Groups

- Newsletters (e.g. APO) can be a vehicle to deliver information to observers, industry and agencies and can benefit all parties.
- Weekly discussion groups with industry and agencies involved allow for resolution of common problems. Observers, industry and agencies are all working toward a common goal: the collection of high quality data to use in sustainable fisheries management.

Greg Croft, Canadian Observer representative, suggested three areas for consideration in maintaining an experienced observer corps:

Attracting and Keeping Good People.

Observers need a solid background, including a proper educational and experiential history, a teachable attitude and a sense of dedication. They should possess a high level of integrity and proper home area for work availability. A medical and insurance plan is a strong incentive.

Advancement Through Training and Upgrading. There should be detailed briefings prior to the opening of each fishery. Debriefings on performance and DFO performance-assessments are invaluable. Scientific input into species-specific training should be coordinated with the observer company. Yearly seminars on developing trends and fisheries developments add to the sense of professionalism among observers.

Full-time Professional Occupation. There must be sufficient sea-time to make an adequate income. Also, there should be a sufficient spread of deployments over several fisheries to remain current, to enhance experience and to maintain interest. Year-round work helps mitigate seasonal lows, perhaps through special industry and science projects.

Peter Scola, U.S. Observer Representative with over nine years experience, agreed that the success of an observer program rests heavily upon the calibre of observers. Often, observers are asked to perform duties unsupervised for extended periods of time with people they have never before met, working in adverse conditions. He stated that it would be almost impossible to run their observer program without the aid of the experienced observers.

Mr. Scola presented his views on why observers want to stay with the program: (a) Flexibility of work-schedule appeals to many; (b) some genuinely enjoy their work on the water and the variety of new things they do and learn; (c) research cruises appeal to many, and (d) post-sampling days allow observers to supplement their incomes during slow periods of the year.

As to what influences observers to leave the program, he suggested the following: (a) Observers often do not get to see the end-product of their labors; (b) many times they are not afforded recognition for their labors; (c) editors and those who revamp forms are too often regarded as more important than the observers who actually fill out the forms; (d) lack of support from enforcement agencies is frustrating. He cited

cases where a Captain refused to admit a female observer on board and another where the observer was physically threatened. In neither case were the offenders sanctioned or was a citation issued; (e) there is little room for advancement in observer programs, an omission which works against long-term retention of employees in the observer program.

Jim Benante, U.S. Observer Program Contractor, outlined his background in the management of observer programs: Alaska Groundfish, California/Oregon Driftnet, Mid-Atlantic Coastal Gillnet, and Cook Inlet Marine Mammal. He believes that observers are the key to any program's success; their experience leads to greater data quality and program efficiency.

Retention, he said, is based on the economics of the various fisheries. He noted that the California Driftnet Program has a high retention rate with 12-14 of the 20 observers having already worked within that program. The retention rate for Alaska is around 50%. (He remarked that the California program provides large pay increases to returning observers.) The FOA offers two observer programs to provide year-round work and program variety, with the potential for advancement. It is important, Mr. Benante, stressed, to provide a sound, respectable program in which the observers feel a sense of ownership.

The differences between the California and Alaska programs were marked. California utilizes a direct contract where Alaska employs a third party. There is greater ownership in California, along with more responsibilities and clearly defined uses of the data and sample collected. The work in Alaska can be extremely repetitious despite the need for diversity. Efforts should be undertaken, Mr. Benante concluded, to ensure that observers' work does not become too gear-specific.

Dr. Harry Benson, *Seawatch*, Canadian Program Contractor, began by relating the changes in the observer-deployment profile between the 1980s and the present. What used to

be a 45-day trip on foreign vessels from a handful of key locations with briefing and debriefing at either end of the voyage has now shifted to 5-day trips with seasonal briefings and deployments from hundreds of fishing communities.

He pointed out that while experience is the best teacher, attrition is the greatest spendthrift – of time and resources. New observers repeat the mistakes that experienced observers originally made, finding “new ways to re-invent the tiller.” Observer skills are specialized and require training and on-the-job experience.

New observers into a program create a significant impact on the contractor in numerous ways:

- **Briefing.** Unlike the experienced observers, new ones require briefing on a host of tasks, sometimes taking four times as long.
- **Debriefing.** Again, the trainee requires significantly more time to discern the errors and then remedy them.
- **Surveillance.** New observers are much more susceptible to being diverted by the skipper and to other omissions.
- **Deployment Logistics.** The new employee will require time to grasp the overall environment and its concomitant detail. More exhaustive explanations are needed.
- **Office Contact.** Calling into the office for advice? The ratio, Dr. Benson says, is 10:1 between trainee and experienced observers.
- **Sampling.** Trainees often become flustered with the challenge of establishing an adequate sampling protocol with each new environment. And sample collection without an otherwise comprehensive data package is counterproductive.

- **Communications.** The very language of the business needs to be learned – and practiced.
- **Skipper Complaints.** New observers have to quickly establish an effective rapport with skippers who need confidence in the observer’s abilities and, hence, respect. Trainees have to live up to the expectations of the crew. Having to respond to complaints from skipper and crew takes its toll on corporate resources.
- **Business Risk.** Deploying new observers is a business risk. The challenge, therefore, of each course and graduating class is to retain sufficient graduates for an adequate period of time to recover the cost of training all participants. Some 30% of trainees do not survive the classroom. The total costs of any course may never be recovered from the continuing graduates, yet the need for new observers is relentless.

Dr. Benson said that their current selection criteria for new observers stress the following: Post-Secondary education, ability for unsupervised work, mathematical skills, fishing industry knowledge, technical-writing ability, and interpersonal skills. He pointed out that “today’s observer will be engaged in frantic activity for five months, working up to 16 hours a day, and, for the most part, witness a dearth of activity for the remaining seven months of the year.” The lure of full-time, 9 to 5-employment poses a significant threat to observer corps stability. He reiterated his company’s faith in its experienced observers, pointing to 8 observers at the Workshop who possessed a combined 120 years of experience – experience commended by local fish companies and the fishermen’s union.

Fifth Session

Panel Discussion: Determining Appropriate Coverage Levels to Meet Multiple Objectives

“Most fishermen see more biology pass through scuppers in a week than most biologists see in a year.”

Moderator

James Nance, NMFS

Panelists

David Orr, DFO Science

Bryan Wood, DFO

Richard Merrick, NMFS Science

John Hoey, NMGS Science

Bill Furlong, Economic Consultant

Dan Ito, NMFS Program Manager

Bryan Wood, Staff Officer for Conservation and Protection with DFO in Nova Scotia, spoke from an enforcement point of view. Canadian observers, he said, fill a dual role of surveillance and scientific duties. (He uses the term “surveillance” as opposed to “enforcement” because observers do not have the powers of arrest or seizure; rather, he terms them “watchdogs.”)

Fishermen tend to view observers as DFO representatives and expect them to know fishing activity regulations. He believes that there is a danger that fish harvesters alter their pattern when an observer is on board whether for scientific or enforcement reasons. Observers are a part of an enforcement “tool kit,” including patrol vessels, aircraft, DFO Fishery officers, and electronic surveillance. Observer coverage – more effective in some fisheries than others – makes more sense from a deterrent point of view rather than for the detection of violation.

Selecting observers for enforcement depends on the type of fishery:

- **Lobster.** Shore patrols and officers in small patrol vessels are more effective.

- **Groundfish.** Observers are more useful here with patrol vessel assisting for about 10-20% coverage because of the expense.
- **Swordfish.** This fishery has by-catch and fish size concerns but distances deter the use of patrol vessels; currently, observer coverage is about 5%.
- **Scallops.** Vessel location is a major concern; by-catch and size can be addressed on shore. Fishery lends itself to electronic monitoring.
- **Bluefin Tuna.** Fishery officer patrols are a better option than observers.
- **Japanese Tuna.** Because of distance from shore and sovereignty issues, 100% observer coverage is the best approach.
- **Snow Crab.** Combination of observers and electronic monitoring is employed here.

Other Considerations. Because of the extended use of observers in the groundfish-pelagic-foreign fisheries, DFO is able to use its limited patrol vessel resources to “hot spots.” Mr. Wood pointed out that observer-performance cannot be measured only by the number of reported violations. The presence of observers on board has a high deterrent value. Observer coverage is a good way to address catch-reporting and gear problems. But there is a need for enforcement tools to address closed area and dumping problems, particularly during observers’ sleep periods. Observers are very effective on freezer trawlers because they can follow the catch from desk through processing to the hold on a daily basis – tasks that a boarding party of fishery offi-

cers could not accomplish thoroughly. It is well to note that enforcement personnel have asked for higher coverage levels than have scientists.

Mr. Wood agreed that that there is a danger that observer data is not always representative because Captains will change their fishing patterns when an observer is on board. Hence the need for enforcement/surveillance strategies. Observer coverage, he concluded, has proven beneficial to other agencies: observers appearing as witnesses in court hearings, observer data utilized in research on marine debris, and observers assisting as communicators in marine emergencies.

Dr. Richard Merrick, Protected Species Branch, NMFS Science, outlined the multiple objectives that appropriate coverage levels must meet. He began by saying that objectives must be clearly defined and prioritized. In the U.S. the basic source of these federal objectives comes from management, science, and bio-political fiat, i.e. from the courts and Congress. In determining coverage, if levels are seen as *a priori*, the effective way will be through regulation, funding and statistical design (though there is danger here in the use of data). He believes that high coverage levels (50-100%) are rarely needed for management science, with 25% observer coverage being the usual norm.

In pilot programs to determine which fishery can and should be observed, the coverage is generally low. In monitoring programs, during initial TRP implementation, the coverage should increase as takes decline. Post-implementation should see reduced coverage. In summary, Dr. Merrick stressed the need to establish clear objectives; decisions should be made on the coverage levels with which one can live; we have to realize that designing coverage for rare species and some data collections often pose special problems.

Dr. John Hoey, Fisheries Biologist with NOAA/NMFS, stated that when he began work with NMFS in the late 1970s, there were no formal domestic observer programs in the U.S.

They learned early that to understand the fisheries and resources they rely on, there had to be at-sea observations. Nothing can replace these observations. "Most fishermen," he said, saw more biology pass through the scuppers in a week than most biologists would see in a year or two."

The cornerstone for initial observer programs included two phases:

- **Characterization.** Observer data answers these questions: Where does the fleet catch? Where and when? What do they do with it? How did they do it? Once you had information you could look at patterns and then modify observer deployments.
- **Experimental.** Observers were re-deployed to collect data that would be used to evaluate management options. They collected the data and made sure that experimental protocols were followed.

Data must be used constructively and effectively to inform the public management debate. If used in a way that fishermen believe is punitive, support and the benefits of observer programs are undermined. Dr. Hoey emphasized that he knew of no other data collection method, besides observer programs, that can provide the detailed information that allows industry and managers to consider the broadest possible range of management options.

He presented an overview of the available long-line data that he and his associates gathered from thousands of sets from research survey cruises extending through a period of over 20 years. The research has allowed them to describe the catch in descending numerical order of abundance, for all records or by area, month and fishing style. They could describe the disposition of the catch in terms of weight and could distinguish between shark, swordfish and tuna fishing patterns. In terms of evaluating management options to address by-catch issues and questions about alternative observer deployment schemes, Dr. Hoey believes they are in a position to exam-

ine the catch data and evaluate whether specific program changes would help address management questions in a cost-effective manner.

Bill Furlong, Economic Consultant, made reference to a recent paper he prepared for DFO, *Optimal Observer Coverage and Deployment*. His focus was the proposition that data from vessels with observers can be compared to those without observers to infer the extent of non-compliance. The greater the measure of non-compliance in a fishery, then the stronger is the case for increased coverage levels.

Mr. Furlong agreed with the observations of other workshop participants that decisions regarding coverage levels appear, in many cases, to be arbitrary. He finds questionable statistical sampling procedures which justify partial coverage levels, based on the belief that samples from observer vessels are representative of fleet-wide fishing activity. If non-compliance is taking place, he said, then the placement of an observer on board can be expected to change the behavior of that vessel. To the extent that this is true, one does not have a representative sample but two very different populations of vessels. In some cases, the entire random sampling approach could be rendered meaningless.

He spoke of the need to apply sound statistical measures in determining coverage levels, explaining a method of testing between the landing of two different vessels – an inference procedure which would more clearly distinguish compliant and non-compliant vessels. A premise central to this approach is that “most violations are motivated by profit and will therefore manifest themselves in above-average profit levels.” In turn, profits are related to the value of landings. There is, therefore, a linkage between violations and above-normal values of landings.

Mr. Furlong explained the elements of his hypothetical fishery, one defined by species, season, area, vessel size, gear etc. Per-trip landing values would be determined. Luck, expertise of crew and skipper would also have to be factored in, carefully determining upper and lower limits.

Data between vessels with observers and those without would be separated, recording average legal landings, while at the same time accounting for luck and productivity which can be independent of the presence of observers. Using a formulaic approach, differences in distribution may be attributed to non-compliance. In effect, one is testing for means-differences using standard tests. He suggested that if one fishery has 30% and another 5%, reallocation of observers should be considered. Having supporting data to support coverage decisions would be valuable in discussions between industry and regulators. Though this system (summarized here) is generic and would require modifications, it does hold promise of providing statistical evidence for the determination of coverage levels.

Dan Ito, NMFS Program Manager, said that the North Pacific Groundfish Observer Program (NPGOP) was originally designed for by-catch monitoring in the foreign fisheries but has evolved considerably since 1990. He pointed out that science, management and compliance objectives often conflict and the tugging-and-pulling on the program makes for a tough balancing act. Their current program call for 100% coverage on vessels greater than 125 feet, 30% for 60-124 foot and 0% for those less than 60 feet. At shore plants the same coverage percentages apply with 100% coverage in plants with greater than 1000 tons per month down to 0% in plants with less than 500 tons per month. In 1998, NPGOP had 562 observers deployed over 31,227 days on approximately 350 vessels and 20 shoreside plants.

Mr. Ito would like to see NPGOP move toward agreement on goals and objectives with authority and flexibility enough to directly control time and placement which would provide for more accurate data and less potential bias. There has to be coverage on vessels less than 60 feet with the codification of logbook data mandatory for those vessels. As well, they should provide for exploration of alternative approaches, e.g. a digital observer program.

They should also move toward an outreach program. Users must recognize that NPGOP is not

the “cure-all” to their scientific data needs; they should appreciate how scientific, management, and compliance objectives conflict; they must likewise avoid the principle of “get the observer to do it.” Analytical basis is needed to assess coverage levels consistent with clearly defined goals and objectives.

David Orr, DFO, outlined the Observer Program undertaken for inshore vessels that fish in Shrimp Fishing Areas 4-6. He stated that there is a perception that data collected by the observer program are used only to find fault with the fishing industry. Such is not the case. Observer data sets were recently used to prove that the offshore (greater than 500 ton) shrimp fishing fleet was not destroying the turbot fishery. The observer allocation plan he described in his presentation is based upon past industry performance with allocations adjusted after re-evaluation. Such allocations, he said, cannot be based upon the simple use of statistics because the data may be a source of information for several users. Additionally, fiscal pressures and the availability of observers may impact allocation plans.

The observer data set from the program serves several purposes: (a) to aid the Fisheries Management Branch in monitoring compliance; (b) to address allegations of high-grading by inshore shrimp fishing fleets, a practice which leads to the underestimation of catches, fishing mortality and the impact on markets when buyers suspect that conservative practices are not being followed; (c) to complement research trawl survey data sets; (d) to collect information in evaluating the impact of shrimp fishing upon snow crab; to collect length frequency and sex

information of commercially important groundfish by-catch (redfish, cod, Greenland halibut). He noted that “by-catch data is being recognized as an important input for stock assessment models. Ultimately, the goal is to arrive at a sound estimation of stock health.

Mr. Orr addressed at length the at-sea observer deployment program which employed a stratified random deployment scheme rather than one based on fixed-landing areas, because the licenses do not restrict fishermen to particular NAFO statistical units. It is apparent that by-catch is discarded at sea; therefore, it is anticipated that the at-sea observations will be the only valid source of by-catch information. Further, the at-sea observer data will be the only source of commercial length/sex/maturity data. The problem of assessment of high-grading by the inshore shrimp fleet is investigated by determining if the shrimp measured at dock-side are significantly larger than those measured at sea. Hence, the need for the dockside observer deployment program, one allowing for random vessel selection through the use of random number tables and the recording of inclusive fishing and species data.

James Nance, NMFS, summarized by reminding delegates that although there is an enormous amount of data that the fisheries generate, observer programs must guarantee that the data being gathered is meeting the scientific and management goals that have been established. Make sure, he said, that your coverage data will not get “layered on top of other statistics.” The objectives we have to meet must be clear and unequivocal.

Sixth Session

Panel Discussion: Implementing Observer Deployment Strategies

“The classic obstacle is the tendency by the industry to avoid observer coverage.”

Moderator

Pierre Mallet

Panelists

Ghislain Chouinard, DFO Science

Marc Naud, DFO Program Manager

Dave Martins, U.S. Observer Program

Don Peterson, NMFS Program

*Marc Gagnon, Observer Program Contractor,
U.S. Contractor*

Ghislain Chouinard from DFO Science spoke of the observer program from a stock assessment point of view. Recording the presence and number of discards is critically important in stock assessment. As well, use of a discard index can assist in the deployment of fisheries observers. The analysis of observer data and its integration with other collected data are also central to deployment. Apart from being useful for scientific investigations, observer data is a source of intelligence for enforcement activities.

The Discard Index. Mr. Chouinard illustrated the need for measuring discard using a case study of the Southern Gulf of St. Lawrence Groundfishery. This fishery is a multi-species fishery targeting cod and flatfish (American plaice and winter flounder). As in Atlantic Canada, the codfishery was closed in 1993, reopening last year with a quota of 6,000 tonnes. Other fisheries are also at much lower levels than in the past. The discarding of small fish has long been an issue in these fisheries, particularly for the plaice where prior to 1990, 40-60% of the catch was discarded. Regulations increasing mesh sizes were implemented, lowering discard amounts. As well, mandatory landing regulations were put in place to discourage fishers from targeting areas with small fish. While dis-

carding is illegal, it has generally been immune to observation. Hence, the development of a discard index. A pilot project was conducted in 1999 and is continuing. (Readers may consult the research: *Allard and Chouinard, Can. J. Fish. Aquat. Sci. 54: 2955-2963, 1997.*)

The concept involves measuring the Length Frequencies of two amounts of fish, before discarding at sea and after discarding at port. A formula involving amounts and slopes was devised to quantify the differences and calculate a discard index. The graphs and figures employed by Mr. Chouinard outlined how the discard index was generated and then how it could be effectively used to target potentially offending vessels and as a deterrent.

Mr. Chouinard and his researchers met with the industry and fishermen at the conclusion of the fishing season and explained the results of the project. The problem was recognized and an increased mesh size has been implemented for this fishing season. As a result of the project, observers are now deployed on vessels with a high discard index and the same vessels can be monitored again at port on future trips. Enforcement operations have been aided in their work. It certainly appears that a similar approach can be applied in other fisheries.

Dave Martins, U.S. Northeast Observer Program, spoke about the challenge they face in obtaining coverage in the vast area ranging from the Canadian border to North Carolina/South Carolina borders. The variety of fisheries is equally great, though the majority of the work is in the coastal gillnet fisheries aboard small vessels. The data collection needs are determined by NMFS and driven by Federal mandates. Most of the focus is on determining by-catch levels and

the interaction of marine mammals, turtles, and sea birds in the fisheries. The emphasis is growing on the need for gathering fisheries information on important commercial fish species.

The geographic area responsibilities have been divided into two regions: Northeast and the Mid-Atlantic. An observer coordinator or port supervisor has been appointed with supervision over 15 observers at any one time. The objective is to follow the sea-day schedule as closely as possible to meet the scientific needs and coverage levels of NMFS. There are obstacles:

- **Sea-day Schedule.** Often not realistic because bad weather, minimal fishing activity, and vessel breakdown often prevent the meeting of program targets.
- **Diverse Fisheries.** Working in a variety of fisheries of varying trip-lengths often makes it difficult to schedule deployments.
- **Management Schemes.** Closed areas and closed seasons make it difficult to keep up with what the fleets are doing on a monthly basis. Each has its own complex set of rules and regulations.
- **Observer Avoidance.** The classic obstacle is the tendency by the industry to avoid observer coverage. Inordinate amounts of time are set by port coordinators in setting up deployment.

Mr. Martins concluded by saying that there has to be a program implemented whereby there are greater incentives to carry observers, perhaps, increased TACs and possible by-catch sales. Improved industry-observer relations and observer job-satisfaction are essential.

Don Petersen, Observer Program Manager with NMFS, spoke about the program for the Southwest Region (SWR). He stated that the objective of observer placements is to verify fishery vessel/fleet interactions with protected species. Their authority to place observers springs from the Marine Mammal Protection Act and the costs for the entire program – for NMFS,

contractor, staff and observers – is 100% Federally funded.

The following protocols govern SWR communications with the Fleet:

- Program Managers research MMPA and associated regulations with legal advice from NOAA.
- SWR issues MMAP permits to vessel owners and authorizes the take of marine mammals and obligates the vessel to carry an observer if requested by NMFS.
- Observer Program issues annual Notice to the Fleet listing all obligations of the vessel, owner, and Captain.
- Vessel obtains U.S. Coast Guard Safety Inspection decal.
- SWR conducts mandatory fishermen workshops for Captain and crew regarding obligations.

The hardest part of the job, according to Mr. Petersen, is the vessel selection for systematic sampling. Vessels must provide arrival and departure information within 48 hours. The dockside monitoring is completed by observers, port samplers and harbor masters. Pre-cruise meetings are held between program managers, observers and Captains to review observer duties, check coast guard safety decal and run through an observer safety checklist.

There is, he says, an SWR bias. Vessels are not required to carry observers on consecutive trips. If a vessel is small or unable to provide sleeping space for an observer, it can be declared exempt. However, it is re-checked annually.

Marc Naud, Observer Coordinator for the DFO Laurentian Region, addressed the effectiveness, efficiency, and constraints of implementing an observer deployment strategy.

- **Efficiency.** Deployment must meet the needs of different information users:

conservation and protection, resource allocations, and science branches. These needs must be clear and precise: Is the need conservation? What particular species? Are the operations longline or trawls? Uniform or random? The strategy must be timely. Decisions cannot be made one week before the particular fishery opens. There must be sufficient time to train observers or, indeed, determine whether there is a sufficient number of observers.

- **Effectiveness.** Deployment must follow the dynamic of the fishing activities during the season. As often as possible, deployment must respond to more than one need at a time. The requirements of science and management are not always congruent with those of conservation.
- **Constraints.** The fact that the needs of information users are not uniform does not mean they are contradictory. Rather, it means they are divergent and, as a result, not equal or

consistent. Different deployment patterns are often required (random vs. targeted, uniform vs. concentrated). The nature of fishing activities is that we are responding to a shifting environment and changing dynamic. They are unpredictable, often because of weather and fishing productivity. Vessels will move from one sector to another if the catch is poor; the pace of a receiving fish plant may determine when and how the vessel fishes. Radical modifications often occur because of quotas that have been achieved or biological changes in species (soft shell) or too-plentiful by-catches. All or any of these may well determine un-anticipated closures in certain fisheries.

There are necessary tools for implementing an effective strategy, Mr. Naud concluded. The levels of coverage must be high enough to meet the needs of all users. There has to be sound knowledge (who, what, when, where) of the fishing activities in order to permit a deployment strategy.



DAY THREE Seventh Session

Panel Discussion: The Integration of Observer Data with Other Information Sources

“Quality fisheries data has enormous benefits for stakeholders worldwide.”

Moderator

Kevin Anderson, DFO, Newfoundland Region

Panelists

Ron Manderson, DFO Gulf Region

Mark Showell, Scotia-Fundy Observer
Program

Bob Mikol, Ocean Logic

Dave Wood, New Zealand Ministry of Fisheries

Cheryl Brown, NMFS Program Manager

Todd Dubois, NMFS Alaska Enforcement
Division

Ron Manderson, DFO, speaking about the Gulf Region fisheries, said that data serves a host of purposes: enforcement, compliance, season-verification, areas fished, shell condition, gear utilization, catch records etc. For science, data is collected for catch composition, stock analysis, biomass estimates, fishery trends, and soft shell monitoring.

Data is integrated from a fisheries management perspective on a daily, weekly and seasonal basis to ensure management plans are adhered to. For the groundfish fishery, both small fish and by-catch data are utilized on a daily basis. If there is a small fish recording greater than 25%, a particular fishery or area will be closed; if the by-catch for undirected species exceeds 25%, the fishery will be closed. In the snow crab fishery, when a 20% rate of soft shell is encountered, the fishery will likewise be closed. During test fish-

eries (10 days for groundfish), if such percentages are below the proscribed levels, the fishery will be re-opened.

The various types of data are integrated on a daily basis to ensure an orderly and compliant fishery. The observer is performing both an enforcement and scientific function aboard the vessel. In order for the program to be effective, the data must be reviewed and utilized on a timely basis by enforcement, science and fisheries management; then it must be integrated by all users to ensure management and compliance protocols are achieved.

The data is also distributed to the industry on a daily basis. In the Gulf Region, Mr. Manderson pointed out, all crab data from observers, at-sea programs, dockside monitoring, at-port samplings, and science analysis are integrated into one system in which vessels can be targeted for observer deployments. Such data are also integrated with information from patrol vessels, aircraft, and fishery officers to provide the best mix of resources.

Mark Showell, responsible for the Scotia-Fundy Observer Program, presented an overview of the elements required for the integration of observer data:

- **Data Sources.** These would include log-books, dockside monitoring records, port

length sampling, vessel sightings, and aerial surveillance.

- **Reasons for Integration.** A major reason is, what he termed, “groundtruthing” of landings data, i.e. making comparisons to DMP/logbook database and ensuring verification of observer estimates. Another reason is to supplement other data collections, having at-sea length frequency data combined with shore samples. As well, comparisons can help highlight the differences between observed and non-observed vessels, checking for size distribution of catch and the discarding of small fish.
- **Current Status.** He believes that the DFO record on data integration is poor. Perhaps the data models were designed in isolation and are difficult to merge. There is little contact between the different groups involved. Also, the “ownership” of data may be problematic.
- **Key to Data Integration.** For Mr. Showell, the answer is “access.” We must remember that the data systems designed to handle information from diverse fisheries are complicated by nature. Specialized skills are often required for access, and a knowledge of database structure is needed.
- **Data Usage.** It appears that, generally, data is used by science. However, in recent years, integrated management initiatives have blurred the distinction between science/enforcement/resource allocation.
- **DFO Access.** Again, access to database requires specialized skills and they are not widely available in C&P and resource management groups. Hence, information is not used to its maximum. Mr. Showell cited the Gardner Pinfold Report: “DFO apparently makes little use of observer data, calling into question the need for the program.”

With the program funding shift to industry, he concluded, deliverables are expected. Vessel operators and fishing groups are now looking for

results from observer deployments. Even with low DFO resources, innovative methodologies are necessary. There should be web-based observer access, perhaps the one developed by Branton & Black.

Bob Mikol of *Ocean Logic* spoke about the early days of the North Pacific fishing industry, relating how vessels at sea would fax in their observer by-catch to their respective monitoring companies. The companies would work up the data and plot a chart. Charts were faxed back to vessels and they adjusted fishing strategies accordingly. This formal sharing of fishing data within the fleet was the first in the North Pacific fisheries. The practice continues to this day, except that it is accomplished by e-mail.

In time, the Alaska Fisheries Science Centre developed electronic data collection software to receive real-time harvest information on the fisheries. A 1998 ruling by the U.S. Department of Justice effectively ended the open access fishery for the Washington/Oregon sector of the whiting fishery and established a quota fishery. Each company agreed to harvest only their historic percentage of the whiting allocation. These companies also, significantly, established a research co-op, contributing \$5 per metric tonne. Their research starts with observer data.

The first project was to identify elements of the yellowtail rockfish by-catch problem. Observer data was used to compare the fishing patterns of each of the seven vessels in the fishery – where and how they fished. ESRI’s ArcView program was used for spatial analysis and Microsoft’s Excel Program was employed to search for temporal patterns. Significant by-catch reductions were a result.

The project also reversed the practice of “short wiring” whereby a trawl net is brought close to the surface when full. Vessels now “long wire,” putting the nets deeper in the water column beneath the fish, reducing the catch of unwanted fish and keeping them cooler for the factory. By-catches were also reduced through the use of big nets fishing of the shelf ledge. Fish harvesters

were able to fish the less dense sections of the school and still maintain an acceptable catch-per-unit of effort.

Dave Wood, New Zealand Ministry of Fisheries, presented background information regarding the program operated by his country. New Zealand operates primarily in the offshore fisheries, mandating ITQ management in most fisheries and requiring detailed reporting. The observer's role is "to observe, record and report on the operation of fishing vessels and their fishing activity." In detail, this role includes: recording details of fishing effort employed, detailed catch data, onboard processing efficiency, assessment of conversion factors, biological data collection, marine mammal and seabird mortality, specimen and sample collection, authorizing of fish discards, transshipment and discharge supervision, and position recording.

Mr. Wood reviewed a number of elements of the New Zealand program:

- **Fishing Effort and Catch Data.** Observers record more detailed information than required of vessel operator. The data is compared to fishing logbook data and used for validation. Records are kept of targeted species and by-catch and compared with vessel reports. As well, records of processing are compared with vessel reports.
- **Validation of Vessel Reports.** Mr. Wood cited an example: A vessel report shows 0-4 by-catch species in small quantities; observer records up to 14 by-catch species and significant quantities; analysis of vessel records show significantly different patterns reported with observers on board. A prosecution results with the use of expert witnesses, supported by detailed vessel and fleet analysis.
- **Marine Mammal Mortality.** In the Auckland Islands Squid Trawl Fishery, fishery closure is declared when mortality reaches a trigger level. They have observers on 20% of vessels. Observed mortality is extrapolated over the fleet. Fishery closure is

also monitored by satellite VMS.

- **Compliance Training.** Fisheries investigators are involved in training, including the maintenance of notebooks and intelligence gathering. Collected information is entered in the National Intelligence database and compared with related information. Enforcement officers are involved in briefing and de-briefing observers.
- **Data Management.** A single comprehensive data warehouse includes fishing logbook data, observer data, vessel register, quota register, quota management returns, licensed fish receiver returns, and VMS data. All such data allow for matching and comparisons.

Todd Dubois, NMFS, stated that the role of the Alaska Enforcement Division (AED) was to ensure the integrity of the North Pacific Groundfish Observer Program data and to offer direct support for observers and the NPGOP. The sources of observer data to enforcement, he said, were direct reporting, including compliant reports, accomplished through real-time and post-cruise reporting. Indirect use of observer data is also employed with database queries from NORPAC and referrals from other divisions.

As for future trends, he sees a continued role for AED in NPGOP, along with an increased use of technology (VMS, electronic logbooks, and integrated databases) and individual vessel accountability. He is convinced that quality fisheries data has enormous benefits for stakeholders worldwide. Forums, such as the present Workshop, help foster understanding among all participants in observer programs.

Cheryl Brown, Program Manager with the Southeast Fisheries Science Center, reviewed the utilization of the current *Oracle Data System*. Her presentation took workshop participants through elements of the system which users could access: e.g. Accumulative Landing, Cooperative Tagging, Dealer Permit, Domestic

Longline, Gulf Shrimp, Florida Trip, Pelagic Longline Logbooks, Vessel Operating Units, etc.

She presented examples of current analysis: CPUE Biomass through weigh-outs and logbooks, Discard Estimates from observers' data, and observer coverage selection. She demonstrated an integrated data system through a flowchart containing four data sources for pelagic longline dating back to 1978: Landing Data Weights Catch, Fishers Logbook Effort Catch (1986 to the present), Permit File Vessels (1989 to the present), and Observer Data Effort Catch Weights. This last source included the foreign fishery, including the Japanese Program (1977-88) and the Domestic Fishery containing the Pelagic Observer Program (1992), the LSU Program (1985) and the Domestic Program (1987).

The Oracle Data System also provides reporting accuracy through the use of observer reports, logbooks, and weight-outs. Ms. Brown provided a series of integration steps:

- Compile common data sets
- Check compatibility between data sets (field names, type and format)
- Identify other sources
- Assign a unique identifier that will link different data sources by their lowest common denominator.

COMMENTARY

With respect to integrating observer data with other information sources, a number of questions and concerns were raised:

- According to one participant, "Enforcement does not get information directly so much as indirectly." There needs to be more sharing regarding legal cases, etc. It is important,

said another, to sit down with industry and ask what they want. It would be valuable to have a series of workshops with industry in order to compare and contrast collected data with word-of-mouth discussions. Often there are two sets of information.

- It would be useful to have a forum at which papers could be delivered that would serve to support observer programs. A suggestion was made that there might be a transfer between agencies of newsletters and logbooks. Obviously such critical issues as stock assessments will be based on sound and thorough data.
- A representative of DFO Science was asked, "Who can access the data you presented here today?" The response was "through the internet." For many this is a "firewall," as the searcher would require a series of passwords. It was suggested that biological data which was not confidential could be made available to Captains on vessels.
- The topic of the "ownership" of data was raised. It often seems that observer information belongs to "the Crown," even though industry pays for it. "If everything starts from compatible databases," a delegate observed, "information is more easily 'shareable.'" Another stated that "within states there is much possessiveness. It is hard to get people to share what they have." He added that Government has not been cooperative. This view was countered by the observation that many systems have very specific purposes and it may not always be "on point" to disseminate that information. It was suggested that there should be joint ventures with industry that allow for a more open sharing of information.

Eighth Session

The Observers' Bill of Rights

“I have no desire to sail with anyone who does not show the sea respect.”

Moderator

Teresa Turk, U.S. Observer Program

Panelists

Reuben Beazley, Canadian Observer Program

Keith Davis, U.S. Observer

Scott Buchanan,

Kimberly Dietrich, U.S. Observer Program

Teresa Turk emphasized that all programs should develop guidelines and incentives that encourage a significant retention rate of experienced observers. Such mechanisms to provide incentives to the contractors may be a performance-based contract that specifies an 80% retention rate and incorporates observers' assessments of their contractor's performance.

In order to guarantee this experienced corps, she believed that the following basic rights must be protected for all observer programs:

1. Observers have a right to a living wage, including but not limited to:

- Health Insurance (Option for year-round coverage and consideration of a national pool to decrease cost)
- Disability insurance
- Life Insurance
- 401-K retirement plan
- Paid vacations and holidays
- Counseling (peer as well as professional)
- Personal and professional insurance
- Transferability of observer credit for purposes of financial compensation from one program to another

2. Definition of “Observer work” for the purpose of compensation should include the following for each program:

- Training
- Debriefing
- Deployment
- Stand-by time (including time between deployments and briefing/debriefing)
- Step-based pay system that encourages experience and exceptional work
- Travel
- Searching for vessel

3. Observers have the right to a safe working environment

- Right of refusal to any vessel without repercussions
- No observer to be placed on a vessel that is considered unsafe
- Define the procedure for what to do if a vessel is considered unsafe (A national protocol should be developed; information of the vessel's safety should be provided to observers)
- Increase minimum safety training standards for all programs and design training to be observer program-specific
- Establish better communications between Coast Guard and fisheries agencies
- Ensure reasonable accommodations and food
- Provide observers with vessel's past safety records via web access

4. Observers have the right to be acknowledged for their contribution to science and resource management, encompassing the following:

- Attendance at workshops
- Credit in publications and other literature

5. Observers have the right to support from their program/agency

- The program should develop support mechanisms for observers which cultivate a sense of belonging
- Each program needs to develop protocols to improve communication, understanding, and support for observers
- A grievance procedure should be established that encompasses the work performed by the contractor or government agency

6. Additional goals suggested for observer programs:

- Standardize data forms and species/gear codes nationally or internationally (e.g. electronic logbook program)
- Creation of a clearinghouse on national/international level for certified observers who span various programs
- Establishment of an electronic mailing list or forum devoted to observer issues
- Direct management staff (e.g. debriefers and trainers) should be required annually to serve at sea as observers, but not as a displacement for regular observers

Reuben Beazley, a Newfoundland observer with *Seawatch*, agreed that safety is the first concern, with the observer on the wharf having the last call on accepting a position on any vessel. He pointed out that fishers avoid safety either through ignorance or desperation. Ignorance can be addressed through education, he said, but desperation cannot be addressed. Asking observers to venture out in 18 foot speedboats hauling crab pots at 150 foot depths five miles from the nearest land is unacceptable. When he has to place his own future and that of his family in the hands of a captain, it is not the company's or DFO's call; it is his. "I have no desire to sail with anyone who does not show the sea respect," he said.

He supported the suggestion that a national protocol as to reporting, inspection and clearance must be developed and followed before another

observer is deployed to a vessel not meeting safety requirements. A full report on a vessel's safety must be made available to observers. There is obviously a need for better communication between Coast Guard, the Department of Transport and DFO. "The non-appearance of the Canadian DOT representatives at this conference just underlines the real need to have these issues addressed."

Along with safety concerns comes the need for decent living conditions for observers. He cited cases of observers contracting scabies and lice infections on vessels; one even ended up with scurvy. Food and hygiene can vary from vessel to vessel, and unfortunately some vessels have low standards.

Mr. Beazley also expressed concern about observers working on middle-size longliners sailing for 2-3 days, living on sandwiches and canned goods, without benefit of showers, and then having to sail out again after a short stay on shore. He spoke also about personal safety, particularly in terms of confrontations with skippers and crews who want only to maximize their profits. This is particularly true on small vessels with small margins. In causing a fishing operation to stop because of violations, an observer effectively ceases the earning power not only of the crew but also his own. He concluded by saying that working himself out of a job is a "weird situation" in which to be placed.

Scott Buchanan, Port Supervisor, *Archipelago Marine Research (AMR)*, spoke specifically to points 4 and 5 of the Bill of Rights (***Observers have the right to be acknowledged for their contribution to science and resource management*** and ***Observers have the right to support from their program***).

He felt that both should be classed together as fostering the professional development of observers. With respect to that professional development, he suggested the following:

- The formation of an advisory committee involving observers who are selected by their peers. He cited AMR's committee, say-

ing that it meets 3 or 4 times a year and is an excellent forum to invite data users to present projects involving the use of observer data and biological catch. He praised the Canada-U.S. Workshop for its work in this area, saying observer participation in such workshops is essential.

- It is essential to provide observers with scientific reports and management documents that use observer data. This provision will heighten observer awareness about their duties and why they are required in the fishery.
- Observer Programs should think about tying observer wage levels and development to data quality, involvement in peer debriefings, and helping with the development and training of new employees.
- A program of professional development of observers should be established similar to those in other professions with apprenticeship and progressive stages. A committee composed of people from observer groups, science and management could set appropriate levels and criteria allowing for such a progression.

Commentary

The Question and Answer session following the Observer's Bill of Rights presentation elicited a host of cogent observations:

- **Up-grading.** *Reuben Beazley* suggested that "you can't put all the information required for proper training at the front end." Early trips begin with simpler work; one moves from sampling to biological information to by-catching information, then to surveillance and navigation skills. There should be accreditation programs offered at appropriate institutions along with a recognition of an observer's current skills.
- *Scott Buchanan* agreed there should be a training facility in a central location to cover all the training needs for observers in that region. He also suggested having more

observers in class-rooms who will act as instructors.

- *David Benson*, Newfoundland Observer, pointed out that there are many discrepancies between regions regarding a host of observer issues. Defining safety is difficult he said. Observers' opinions come from having worked on many vessels; fishermen serve usually on only one. He felt also that it is difficult to define "a living wage." An observer can be on a factory freezer trawler with a comfortable cabin and state-of-the-art technology. Yet a fisherman on that same trawler can often earn three times the observer's salary doing an easier job. In other words, depending on the situation one is placed in, it is not easy to understand what is meant by "a day's pay for a day's work." Sometimes observers have to work on vessels which are "run by crazies with guns and booze." And yet, observers have made the industry rich by sending them out to rich fishing grounds. "Empires have been built, balanced on the tip of my knife," he said. Regarding the model of observer background used, he asked, "Do you take a scientist with a biology degree and attempt to turn him into a sailor (U.S. model), or do you take some kind of hairy-arsed seagoing reprobate and attempt to turn him into a scientist (Canadian model)?"
- *Kim Dietrich*, in appended notes, suggested that there should be information and data provided that would allow for comparisons across all regions with observer programs. Such data from operational observer programs would include the following: The number of vessels and the number of observers utilized; the average deployment length by vessel type and fishery; the attrition rates; the number of violations reported and the number pursued from observer reports. What is the estimated annual value of various target fisheries? Are observer unionized in certain regions? What are effective coverage rates? (Apples are not being compared with apples here, she said.) What is the definition of a fishing day?

There was, as well, a wide range of comments made during the plenary session:

- Too often an observer has to go from one boat to the next and to the next. There's "three times the exhaustion and we are trying to serve multiple masters."
- Regarding the safe vessels, it was observed that "you know the bad ones over time and those vessels should be tagged and Coast Guard/DFO should be informed."
- An observer commented that fish harvesters must remember that data is necessary for management decisions and stock conservation. The fish is not the fisherman's because he catches it. "It belongs to all of us." The taxpayer should also "be in the pot."
- Observers are there not must because it is a job, said a delegate, but because they care about conservation. At the same time, how does one link experience and data quality and how to get good quality data at 20% coverage versus 100% coverage?
- It was suggested that some of the problems found in Observer Programs are systemic in nature. No individual agency can solve them alone. Observers need to find the leading edge to increase their power because at the present time they are only commodities that might be substituted for by an approach that is deemed a cheaper cost to the producer.
- The question was raised by several delegates as to what can happen when observer data is used to close a fishery. In such situations, an observer is certainly not popular on the boat. Some wondered if it was ethical to put an employee in the position of having to make this decision — not only for the observer but also for his colleagues. One observer concluded that integrity of data has to be first for him. In effect, it is his conscience. He wants to be part of something that is real and useful.

Ninth Session

The Future of Observer Programs and Workshop Wrap-up

“The work of an observer and the information gathered must be based on accountability, reliability, and integrity.”

The final presenter for the Canada-U.S. Fisheries Observer Program Workshop was **Graeme Parkes** who addressed the issue of the future of observer programs. The text is summarized under the following headings.

- **Overview of the Program.** The fishing industry has witnessed a rapid expansion in observer deployment with a wide variety of goals and objectives for the observer, some often conflicting. Vessel accountability has grown and the program now uses a variety of service delivery models. The future will see a continued expansion and improved awareness of what observers do. The people who fund will have to be continually convinced of the importance of the program. Technology will be an asset for the observer in the future. The ecosystem approach to fisheries management is relatively new and will rely even more heavily on observers and the work they do.
- **General Industry Issues.** At present there is general acceptance of the need for observers. Deployment onto smaller vessels will increase. While there are 100-foot trawlers off-shore, there are 50-foot shrimpers as well. Because of eco-system issues, many fisheries will not be able to operate without observers. The problems specific to small vessels have to be acknowledged. The dictum, “no one size fits all,” is appropriate here. With respect to data access, serious consideration should be given to the web-based system described in an earlier presentation. Finally, the work of an observer and the information gathered must be based on accountability, reliability and integrity.
- **Funding.** We have a variety of funding mechanisms with only some of them federally funded, adding a burden of the industry. The industry, of course, will want to see what it is getting for its money. So we must provide cost/benefit analyses. Likewise, there must be an efficient allocation of observer resources. Some fisheries do not need 100% coverage; hence, there should be rational re-deployment in the future. The program should move away from “pay-as-you-go” to other forms of creative contracting.
- **Safety.** Observers work in an inherently dangerous environment – fishers and observers are “in the same boat.” Training should be focused on safety at sea; liability issues must be discussed and observers made fully aware of them. We should focus on observer-specific issues such as workload and work-environment. New observers must be instructed in the code of safe conduct on vessels. Every boat should have essential equipment now. Safety on small vessels is a concern for observers; there must be support for observers who refuse to board what is determined to be an unsafe vessel. Communications among and between the agencies associated with the observer program is paramount.
- **Experienced Corps.** Presently we are experiencing a high turnover of first-time observers. Morale and incentives are low. Few opportunities for advancement are seen. We have to shift the emphasis. Observers must see themselves as part of a profession, one with attractive wages and benefits and a certification system with allows for diversity

of opportunities. We should be in the business of “team building.”

- **Coverage Levels.** It has become a truism in the fishery that unobserved vessels behave differently from observed ones. We still face arbitrary coverage levels, sometimes excessive and other times inadequate. Increased statistical analyses will change how we deploy. As well, we must find incentives to change the behavior of fishers if they are ignoring fundamental rules and regulations. If there are conflicts in the industry regarding fishing practices, resolve them. Do not expect observers to be solely responsible. They are not the only solution.
- **Deployment Strategies.** Again, no single strategy is the answer. We have to factor in the season of the year and weather. With regard to the aforementioned incentives, vessels and their crew must come to see the need for and value of carrying observers. Some good suggestions have come from the workshop about encouraging vessels to avoid violations. We should also allow for observer choices within the program.
- **Data Integration.** It used to be that “recent” meant within the last three years. Now, the rapid development of data gathering technology is in “real time.” Along with the collection of increasing amounts of information, there will be a concomitant sharing of data and programs; we will witness a growing use of the internet and all-around improved access. (At the same time, security and data confidentiality are becoming important issues.) Geographic information systems allied with the standardization of data formats and databases will make observer programs more effective for the fisheries worldwide.

Commentary

The Workshop Summary and Wrap-up were combined into one because of the expedient of time. While the comments from the floor were varied and random, some took the form of sug-

gestions and others were less-formalized recommendations.

- **Data.** Nelson Beideman observed that the data gathered has to reflect reality, so it is important that all participants and agencies in the fishery must provide access of such information to each other. Graeme Parkes agreed but pointed out that a major issue is a form of “turf boundaries and wars” between and among the agencies. Gaining access to information, he suggested, is an issue that “needs to be tackled.”
- **Participation.** Hugh Parker felt that a big plus of this year’s workshop was the participation by observers and industry. We need to improve on the overall participation. Vicki Cornish said that it is often difficult to “get industry away from their jobs.” Some choose to go fishing. We do need more representation from industry; the question is, how do we get them? Perhaps the choice of topics to be discussed should be considered. In any case, creative ideas must be generated.
- **Next Workshop.** Ben Rogers called for suggestions from the floor. David Benson suggested New Zealand as the site. John Kelly offered Hawaii. It is situated in the middle of the Pacific, is a “central” location, and if it were considered, he would help in the process. Peter Sharples, being from the Solomon Islands, liked the “international” idea and felt they could contribute. Tom Jamir suggested selecting a site on the basis of family orientation as well as cost, perhaps a city like Orlando. Ernesto Altamirano of California said that he had benefited tremendously from the conference and believed that using the vehicle of International Trade Missions could be instrumental in making the workshop even more inclusive. Ben Rogers also supported the idea of having the gatherings more international and urged participants to send along their suggestions through e-mails.

-
-
- **Format.** Small discussion groups were put forth as an approach to accomplishing more. Hugh Parker thought that evaluation forms could improve the approach to improving the style and format of future workshops. Perhaps the fall season, when many fisheries are completed, would be more preferable. Also, it is low season for airline travel and, hence, less expensive. Mike Cox opined that no matter the format, the time is never enough. The best exchanges are often outside the formal sessions. He strongly suggested doing a 2-year tracking of the changes in the observer programs. In that way, we have the opportunity to find out just what has changed in the intervening time-periods. Vicki Cornish acknowledged that the recent

Progress Report did not reflect such changes, e.g. training, regulations, etc. She suggested that for the next workshop consideration be given to such an analysis. It was also recommended that for the next workshop “we get our data up to scratch.”

- **Commendation.** The remarks from the floor regarding the work of the steering committee and the efforts of the hosts in the preparation for and presentation of the Workshop were generous and sincere. Appropriately, the approbation of the gathering, demonstrated in an enthusiastic round of applause, brought the week’s proceedings to a successful conclusion.

Delegates to the Workshop

Altamirano, Ernesto
Inter-American Tropical Tuna Commission
8604 La Jolla Shores Drive
La Jolla, CA USA 92101
Tel: (858) 546 7032
Fax: (858) 546 7133
Rlindsay@iattc.org

Ackerman, Barry
DFO
Vancouver, BC
ackerman@dfo-mpo.gc.ca

Anderson, Neil
Torngat Fish Producers Co-operative Society
Limited
155 Hamilton River Road
Happy Valley - Goose Bay, Labrador A0P 1E0
Tel: (709) 896 3992
Fax: (709) 8963336
Neil_anderson@cablelab.net

Annand, Christine
Department of Fisheries and Oceans
176 Portland
Dartmouth, Nova Scotia
B2Y 1J3
Tel: (902) 426 3415
Fax: (902) 426 9683
AnnandC@mar.dfo-mpo.gc.ca

Aparicio, Pete
Gulf of Mexico Fishery Management Council
5809 Salem Road
Victoria, Texas USA 77904
Tel: (361) 578-4989
Fax: (361) 578-0875

Arceneaux, Stuart
NMFS
Office of Science & Technology
1315 East West Highway, Silver Spring MD
20910
Tel: (301) 713-2318
Fax: (301) 713-4137
Stuart,Arceneaux@noaa.gov

Baird, James
DFO
PO Box 5667, St. John's, NF A1C 5X1
Bairdj@dfo-mpo.gc.ca

Baker, Monique
DFO
343 University Ave
Moncton, NB
Tel: (506) 851-6234
Fax: (506) 851-2607
BakerM@dfo-mpo.gc.ca

Beazley, Reuben
Fishery Observer
Seawatch Inc
Lewins Cove
Placentia Bay, NF
Tel: (709) 832-2329
Reuben.beazley@nf.sympatico.ca

Beideman, Nelson
B.W.F.A.
910 Bayview Ave.
Barnegat Light, NJ 08006

Benante, Jim
Frank Orth & Associates
10900 NF 4th. Street, Suite 900
Bellevue, WA 98004

Benson, David
Fishery Observer
Seawatch Inc
Tors Cove
NF
Tel: (709) 334-2240

Benson, Harry
President
Seawatch Inc
17-19 Pippy Pl
St. John's NF
Hbenson@beothuk.com

Bevan, David
Dept. of Fisheries and Oceans
200 Kent St.
Ottawa, Ontario K1A 0E6
Tel (613) 990 6794
Fax:(613) 990 1407
Bevand@dfo-mpo.gc.ca

Blikshavn, Rolf
Fiskeridirektoratet
Postboks 185 - Sentrum
5804 Bergen, Norway
Tel: +475-523-8213
Fax: +475-523-8090
rolf.blikshavn@fiskeridir.dep.telemax.no

Borggaard, Diane
NMFS
9721 Executive Center Drive North
St. Petersburg, Fl. USA 33702
Tel: (727) 570 5312
Fax: (727) 570 5517
Diane.Borggaard@noaa.gov

Bradshaw, Valerie
Fisheries and Oceans
176 Portland
Dartmouth, NS B2Y 1J3
Tel: (902) 426 7198
Fax: (902) 426 9683
BradshawV@mar.dfo-mpo.gc.ca

Brock, Dennis
Dept. of Fisheries and Oceans
200 Kent St.
Ottawa, Ontario K1A 0E6
Tel: (613) 990 6012
Fax (613) 941 2718
Brockd@dfo-mpo.gc.ca

Brothers, Gerald
Department of Fisheries and Oceans
Fish Management Branch
PO Box 5667
St. John's, NF A1C 5X1
Tel (709) 772 4438
Fax: (709) 772 2110
BrothersG@dfo-mpo.gc.ca

Brown, Cheryl
NMFS/Southeast Fisheries Science Center
75 Virginia Beach Dr.
Miami, Fl USA 33149
Tel: (305) 361-4275
Fax: (305) 361-4562
Cheryl.brown@noaa.gov

Buchanan, Scott**
Archipelago Marine
Research
200-525 Head Street
Victoria, BC V9A 5S1
Scooter@cedar.alberni.net

Burke, George
DFO
4A Bayley Street, Suite 200
Grand Falls-Windsor
NF A2A 2T5
Tel: (709) 292-5160
Fax: (709) 292-5203
Burkeg@dfo-mpo.gc.ca

Calcutt, Mike
DFO
200 Kent Street, Station 13026
Ottawa, Ontario K1A 0E6
Tel: (613) 990 0096
Fax: (613) 990 7051
Calcuttm@dfo-mpo.gc.ca

Chabinka, Jacob
Javitech Limited
15 Woodbury
Halifax NS B3M 1Z7
Tel: (902) 468-9899
Fax: (902) 468-9779
Javi@hfx.auracom.com

Chenard, Jean-Pierre
Biorex
95 Rue Guillaume
Caraquet, NB
E1W 1A9

Chouinard, Ghislain
DFO
343 University Ave.
P.O. Box 5030
Moncton, NF
E1C 9B6

Chouinard, John
DFO
Enforcement Branch
Laurention Region
104 Dalhousie Street
Quebec City, Quebec
ChouinardJo@dfo-mpo.gc.ca

Coffin, David
DFO
P.O. Box 8700
St. John's, NF A1B 4J6

Cormier, Georges
DFO

Cornish, Victoria
National Marine Fisheries Service
National Observer Program
1315 Eat-West Highway, F/ST1, Silver Spring,
MD USA 20910
Tel: (301) 713-2328
Fax: (301) 713-4137
Vicki.Cornish@noaa.gov

Cosh, Bob
Department of Fisheries and Oceans
Station 13093 - 200 Kent Street
Ottawa, Ont. K1A 0E6
Tel: (613) 993 2055
Fax: (613) 990 9691
Coshb@dfo-mpo.gc.ca

Cox, Michael**
Javitech Limited
15 Woodbury
Halifax NS B3M 1Z7
Tel: (902) 468-9899
Fax: (902) 468-9779
Javi@hfx.auracom.com

Croft, Greg*
Fishery Observer
Javitech
15 Woodbury
Halifax NS
Tel: (902) 426-7243
Fax: (902) 426-5850
Javi@hfx.auracom.com

Curran, Tom
Fisheries and Oceans
P.O. Box 5667
St. John's, NF A1A 3C5
Currant@dfo-mpo.gc.ca

Curtis, Rita
Dept. of Commerce
Rita.Curtis@noaa.gov

Davis, Keith
NMFS Observer
8750 E. Palo Verde Drive
Scottsdale, Arizona
8520
Tel: (480) 922-3103
Lblegend@yahoo.com

Dedrick, Gary
Canadian Council of Professional Fish
Harvesters
RR # 3
Shelburne, NS E0T 1W0

DeGrace, Pierre
DFO
343 Universite Avenue
Moncton, NB E1C 9B6
Tel: (506) 851 6074
Fax: (506) 851 2387
Degracep@dfo.mpo.gc.ca

Degruchy, Wayne
Fishery Observer - Seawatch
St. John's, NF

Derksen, Ken
Archipelago Marine
Research
200-525 Head Street
Victoria, BC V9A 5S1
Kend@archipelago.bc.ca

Dietrich, Kimberley
Assoc. for Professional Observers
5026 9th Ave NE
Seattle WA 98105
Tel: (206) 547-4228
Kdiet@aa.net

Donahue, Brian
DFO
200 Kent St. Ottawa, Ont.
K1A 0E6
Donahueb@dfo-mpo.gc.ca

Dubois, Todd
NOAA/NMFS
Office for Enforcement
22 West 7th Ave., Box 10
Anchorage, Alaska USA 99513
Tel: (907) 271 5745
Fax: (907) 271 4915
Todd.Dubois@Noaa.gov

Dunne, Tony
DFO
552 Pouch Cove Highway, Flatrock, NF
Tel: (709) 772-2784
Fax: (709) 772-5983
dunnea@dfo-mpo.gc.ca

Dutton, Jack
2446 Waiomao Road
Honolulu, Hi, USA 96816

Evans, Ron
DFO
PO Box 5667, St. John's, NF A1C 5X1
Tel: (709) 772 4412
Fax: (709) 772 5983
Evansw@dfo-mpo.gc.ca

Evans, Wayne
DFO
PO Box 5667, St. John's, NF A1C 5X1
Tel: (709) 772 4412
Fax: (709) 772 5983
Evansw@dfo-mpo.gc.ca

Fitzgerald, Shannon
NOAA
7600 Sand Point Way NE
Seattle WA 98115
Tel: (206) 526-4553
Fax: (206) 526-4066
Shannon.fitzgerald@noaa.gov

Foster, Harold
NOAA/Northeast Fisheries Science Center
166 Water Street
Woods Hole MA USA
02543-1097
Tel: (508) 495 2212
Fax: (508) 495 2066
Harold.Foster@noaa.gov

Furlong, William J.
Dept. of Economics
University of Guelph
Guelph, Ontario
N1G 2W1
Tel: (519) 824-4120
Wfurlong@uoGuelph.ca

Gagnon, Marc
Biorex
295 Chemin st. Foy
Quebec City, Que.
Tel: (418) 522-4945
Fax: (418) 522-5218
Info@biorex.com

Gardner, Michael
Gardner-Pinfold Consulting Economists Ltd.
1331 Brenton St.
Halifax, NS B3J 2K5

Gauvin, Jean
Pese - Peche Inc
140 Premier Rue
Shippigan, NB
Tel: (506) 336-1400
Fax: (506) 336-1401

Gauvin, John
Groundfish Forum
4215 21st Ave. West, Suite 201 Seattle, WA
98199
206 301-9504
gauvin@seanet.com

Gibson, Caroline
Pacific Marine Conservation Council
P.O. Box 59
Astoria, OR 97103
caroline@pmcc.org

Gill, Rick
Teamsters Union
99 LeMarchant Rd
St John's NF A1C 5N8
Tel: (709) 579-5706
Fax: (709) 722-7738

Graham , Gary
Gulf & S. Atlantic Fisheries Foundation
P.O. Box 710
Palacios, Texas USA 77465
Tel: (361) 972 3654
Fax: (912) 972 6539
Grahamg@tamug.tamu.edu

Green, Beverley
DFO
PO Box 5667, St. John's, NF A1C 5X1
Greenb@dfo.mpo.gc.ca

Hache, Jean-Charles
Pese - Peche Inc
140 Premier Rue
Shippigan, NB
Tel: (506) 336-1400
Fax: (506) 336-1401

Hanrahan, Joe
Biorex
11 Morris Dr.
Dartmouth, Nova Scotia
B3B 1M2
Tel: (902) 468 5243
Fax: (813) 468 5239
Joe.hanrahan@ns.sympatico.ca

Hansford, Dennis
NMFS
Office of Science & Technology
1315 East West Highway, Silver Spring MD
USA 20910
Fax: (301) 713-4137
Dennis.Hansford@noaa.gov

Hanson, Emily
NMFS
1315 East-West Highway, F/PR2
Silver Spring, MD USA 20910
Tel: (301) 713-2322 x101
Fax: (301) 713-4060
Emily.Hanson@Noaa.gov

Harrington, David
Gulf & South Atlantic Fisheries Foundation Inc
106 Arthur Moore Drive
St. Simons Island
Georgia USA 31522
Tel: (912) 638-3213
Fax: (912) 638-6682
Dharring@arches.uga.edu

Hebert, Marcel
DFO
343 Universite Avenue
Moncton, NB E1C 9B6
Tel: (506) 851 6074
Fax: (506) 851 2387
Hebertm@dfo-mpo.gc.ca

Henry, France
Biorex Inc
182-3 rue de la Reine
Gaspé PQ
Tel: (418) 368-5597
Fax: (418) 368-1372
Biorex@globetrotter.qc.ca

Hinteregger, Georg
NMFS Contract Observer
20 Old Switch Rd.
Hope Valley, Rhode Island USA 02832
Tel: (401) 539 2015
f.hinteregger@worldnet.att.net

Hoey, John
NMFS
F/ST1 1315 East West Highway, Silver Spring
MD 20910
Tel: (301) 713-2328
Fax: (301) 713-4137
John.hoey@noaa.gov

Ito, Daniel
NOAA
7600 Sand Point Way NE
Seattle WA 98115
Tel: (206) 526-4194
Fax: (206) 526-4066
Dan.ito@noaa.gov

Jamir, Tomas
Gulf & S. Atlantic Fisheries Foundation, Inc.
5401 West Kennedy Blvd.
Tampa, Florida USA
33609
Tel: (813) 286 8390
Fax: (813) 286 8261
Tom.jamir@worldnet.att.net

Jean, Maurice
Biorex Inc
13-111Boul. St Pierre O.
Caraquet NB
Tel: (506) 727-7635
Fax: (506) 727-7338
Biorexnb@nbnet.nb.ca

Jenkins, Randy
DFO
PO Box 5667, St. John's, NF A1C 5X1
Jenkinsr@dfo-mpo.gc.ca

Kelly, John
US Dept of Commerce/NOAA/NMFS
1266 Akele St.
Kailua, Hi, 96734
Tel: (808) 973-2937
Fax: (808) 973-2941
John.d.kelly@noaa.gov

Kieley, Bernard
Local 855,
Teamsters Canada
29 Riverside Drive
Goulds, NF. A1S 1C1
Tel: 745 1028

Knight, Morley
DFO
St. John's, NF

Kulka, David
DFO
St. John's NF
Tel: (709) 772-2064
Fax: (709) 772-5469
Kulkad@dfo-mpo.gc.ca

LaFargue, John
Frank Orth Assoc.
229 7th. Street
Pacific Grove, CA 93950

Lambert, Jean Denis
DFO
Quebec

Lane, Jerry
Fishery Observer
Seawatch Inc
PO Box 333
Botwood, NF
Tel: (709) 257-2426
Thelanes@nf.sympatico.ca

Limpinsel, Doug
NOAA
7600 Sand Point Way NE
Seattle WA 98115
Tel: (206) 526-6696
Fax: (206) 526-4066
Doug.limpinsel@noaa.gov

Linstead, Gilbert W
Labrador Fishermen's Union Shrimp Co. Ltd.
P.O. Box 130
Lanse Au Loup, Labrador
Tel: (709) 927 5816
Fax: (709) 927 5555

Loefflad, Martin
NOAA
7600 Sand Point Way NE
Seattle WA 98115
Tel: (206) 526-4195
Fax: (206) 526-4066
Martin.loefflad@noaa.gov

Lybeck, Shelly
8252 126th Ave. NE #D-102
Kirkland, WA 98033

Maier, Bob
NOAA
7600 Sand Point Way NE
Seattle WA 98115
Tel: (206) 526-4197
Fax: (206) 526-4066
Bob.maier@noaa.gov

Mallet, Pierre
DFO
P.O. Box 5030
Moncton, NB
E1C 9B6
Tel: (506) 851-7792
Fax: (506) 851-2607
Pmallet@dfo-mpo.gc.ca

Manderson, Ronald
DFO
343 University Ave.
New Brunswick,
E1C 9B6
Tel: (506) 851-2088
Fax: (506) 851-2504
Mandersonr@dfo.com.ca

Martin, Edmond
Director, C&P
DFO
343 University Ave
NB, E1C 9B6

Martins, David
Professional and Technical Services Inc
166 Water Street
Woods Hole, MA USA 02543-1026
Tel: 1 888 404 9966
Fax: 1 888 495 2258
David.Martins@noaa.gov

Mathison, Ann-Lis
DFO
St. John's

McEachern, Vance
Dept. of Fisheries and Oceans
200 Kent St.
Ottawa, Ontario K1A 0E6
Tel: (613) 993 0250
Fax: (613) 954 1407
McEachernv@dfo-mpo.gc.ca

McElderry, Howard
Archipelago Marine
Research
200-525 Head Street
Victoria, BC V9A 5S1
Shawns@archipelago.bc.ca

Melindy, Shawn
Dept of Fisheries & Aquaculture
Box 2451
Goose Bay, Lab
Tel: (709) 896-3412
Fax: (709) 896-3483
Smelindy@mail.gov.nf.ca

Merklein, Amanda
Fisheries, Consultant
Seattle

Merrick, Richard
NMFS
166 Water St
Woods Hole MA USA 02543
Tel: (508) 495-2291
Fax: (508) 495-2066
Richard.merrick@noaa.gov

Mikol, Robert
Ocean Logic LLC
7348 North Douglas Hwy
Juneau Alaska USA 99801
Tel: (907) 586-0145
Fax: (907) 586-0165
Rmikol@oceanlogic.com

Miri, Carolyn
DFO
St. John's NF
MiriC@dfo-mpo.gc.ca

Moran, Con
Teamsters Canada
PO Box 402
Pouch Cove, NF. A0A 3L0
Tel: 579 0886

Morgan, Greg
North Pacific Fisheries Observer Training
Center
707A St. Suite 207
Anchorage Alaska USA
99501
Tel: (907) 257-2770
Fax: (907) 257-2774
Angtm@uaa.alasks.edu

Nance, James
National Marine Fisheries Service
4700 Ave. U
Galveston, TX 77551
Tel: (409) 766-3507
Fax: (409) 766-3508
James.m.nance@noaa.gov

Naud, Marc
DFO
104, rue Dalhousie
Quebec City, Que.
G1K 7Y7
Tel: (418) 648-5887
Fax: (418) 648-7981
Naudm@dfo-mpo.gc.ca

O'Donnell, Paul**
NOAA
Fisheries Observer
4 Suzanne Circle
Wareham, MA 02571
508-291-6321

Park, Tim
Micronesian Maritime Authority
P.O. Box P.S. 122
Palikir, Pohnpei
Federated States of Micronesia 93941

Parker, Hugh
DFO
Scotia Fundy Region
6315 Jubilee Road
Halifax, NS, B3H 2G6
Tel : (902) 426-5850
Parkerh@mar.dfo-mpo.gc.ca

Parkes, Graeme
MRAG Americas, Inc
5445 Mariner Street Suite 303
Tampa FL USA 33609
Tel: (813) 639-9519
Fax: (813)639-9425
Graemeparkes@compuserve.com

Payne, Brigid
DFO
555 W. Hastings - Suite 460
Vancouver, BC V6B 5G3

Peacock, Gregory
DFO
176 Portland St.
Dartmouth, NS B2Y 4T3
Tel: (902) 426 3625
Fax: (902) 426 9683
PeacockG@mar.dfo-mpo.gc.ca

Petersen, Donald
National Marine Fisheries Service - Southwest
Region
501 W. Ocean Blvd, Ste. 4200
Long Beach, California
90802-4213
Tel: (562) 980-40241
Fax: (562) 980-4047
Don.Petersen@noaa.gov

Phipps, Lynne B.
NOAA
Office of Finance and Administration
Eastern Administration Support Center
Rm. 209, 200 World Trade Center
Norfolk, VA. USA 23510
Tel: (757) 441 6881
Lynn.b.phipps@noaa.gov

Pinksen, Larry
Fish, Food & Allied Workers
St. John's, NF.

Purchase, Kim
DFO

Rice, Dennis
Fishery Observer
Seawatch Inc
St. John's, NF

Richer, Paul
Department of Fisheries and Oceans
200 Kent Street
Ottawa, Ontario K1A 0E6
Tel: (613) 990 0094
Fax: (613) 941 2718
RicherP@dfo-mpo.gc.ca

Robinson, Kathy
Saltwater Inc.
7029 Linden Circle
Anchorage, Alaska USA 99502
Tel: (907) 276 3241
Fax: (907) 258 5999
Kathy@saltwaterinc.com

Rogers, Ben
DFO
PO Box 5667, St. John's, NF A1C 5X1
Tel: (709) 772-4495
Fax: (709) 772-5983
Rogersb@dfo-mpo.gc.ca

Rowe, Lionel
L.W. Rowe & Associates Ltd.

289 Clarence St.
Ottawa, Ont. K1N 5R2
Tel: (613) 789 5901
Fax: (613) 789 4064
Lwrltd@home.com

Saelens, Mark
Oregon Dept. of Fish and Wildlife
2040 SE Marine Science
Newport, OR. USA 97365
Tel: (541) 867 0300 X-251
Fax: (541) 867 0311
Mark.saelens@hmsc.orst.edu

Scola, Peter
Professional and Technical Services Inc.
70 Harrison Ave
Gloucester, MA USA 01930
Tel: 1 888 841 5400
Fax: 1888 841 5400
Pscola6728@aol.com

Sharples, Peter
Oceanic Fisheries Programme
B.P. D5
Noumea Cedex
New Caledonia
98848
Tel: (687) 260146 777799 262000
Peterbs@spc.int

Shinsky, Thomas
Professional and Technical Services Inc
33 Prospect Street
Bristol RI USA 02809

Showell, Mark
Bedford Institute of Oceanography
Dartmouth, NS
B2Y 4A2

Small, Harold
3K Fulltime Crab Harvester Association Inc.
PO Box 24
Wild Cove, White Bay A0A 5P0
Tel :(709) 329 3201
Fax: (709) 329 3411

Staisch, Karl
South Pacific Forum Fisheries Agency
Tandai Highway
Honiara, Guadalcanal
Solomon Islands
Tel: (677) 21124 or 24312
Fax: (677) 23995
Karl.staisch@ffa.int

Stebbins, Shawn
Archipelago Marine
Research
200-525 Head Street
Victoria, BC V9A 5S1
Shawns@archipelago.bc.ca

Stoker, Gillian
North Pacific Groundfish Program
3323 36th. Ave. S
Seattle Wa.

Thounhurst, Kim
NMFS/Northeast Regional Office
1 Blackburn Drive
Gloucester, MA USA 01930-2298
Tel: (978) 281 9138
Fax: (978) 281 9394
Kimberly.thounhurst@noaa.gov

Tominson, James
TempTek Inc.
4831 Fauntleroy Way SW
Seattle, Wa 98116

Toner, Margaret
NMFS
1315 East West Highway, Silver Spring, MD,
USA 20910
Tel: (301) 713-2328
Fax: (301) 713-4137
Margaret.toner@noaa.gov

Tork, Michael
NMFS
255 Seacoast Shores Blvd.
Falmouth MA USA 02536
Tel: (508) 495-2339
Fax: (508) 495-2258
Mike.tork@noaa.gov

Tremblay, Denis
DFO
104 Dalhousie
Quebec City, Que.
G1K 7Y7
Tel: (418) 648-5885
Fax: (418)649-8022
Tremblen@dfo-mpo.gc.ca

Trowbridge, Sandra
DFO
PO Box 5667, St. John's, NF A1C 5X1
Tel: (709) 772-4618
Fax: (709) 772-5983
Trowbridges@DFO-MPO.gc.ca

Turk, Teresa
NMFS
2725 Montlake Blvd. E
Seattle WA USA 98112
Tel: (206) 860-3460
Fax: (206) 860-3394
Teresa.turk@noaa.gov

Violette, Gabriel
Biorex
172 Boul. Forillon
Forillon, PQ
G4X 6L2

Way, Denis
DFO

Whelan, Ben
DFO
PO Box 5667, St. John's, NF A1C 5X1
Tel: (709) 772-5482
Fax: (709) 772-5983
Whelenb@dfo-mpo.gc.ca

Williams, Neil
NMFS
1315 East West Highway
Silver Spring, MD USA 20910
Tel: (301) 713 2245
Neil.williams@noaa.gov

Wood, Dave
New Zealand Ministry of Fisheries
P.O. Box 1020
ASB Bank House, 101 -103 The Terrace
Wellington, New Zealand
Tel: 64-4-470 2664
Fax: 64-4-470-2660
Wooddj@fish.govt.nz

Wood, Brian M
Fisheries and Oceans
P.O. Box 1035
Dartmouth, NS B2Y 4T3
Tel: (902) 426 7627
Fax: (902) 426 8003
Wooddm@Mar.dfo-mpo.gc.ca

Woodley, Chris
Cdmr 13th Coast Guard District
915 2nd Ave, Suite 3506
Seattle, WA 98174
206-220-7217

Young, Paul
DFO
St. John's NF
Youngp@DFO-MPO.gc.ca