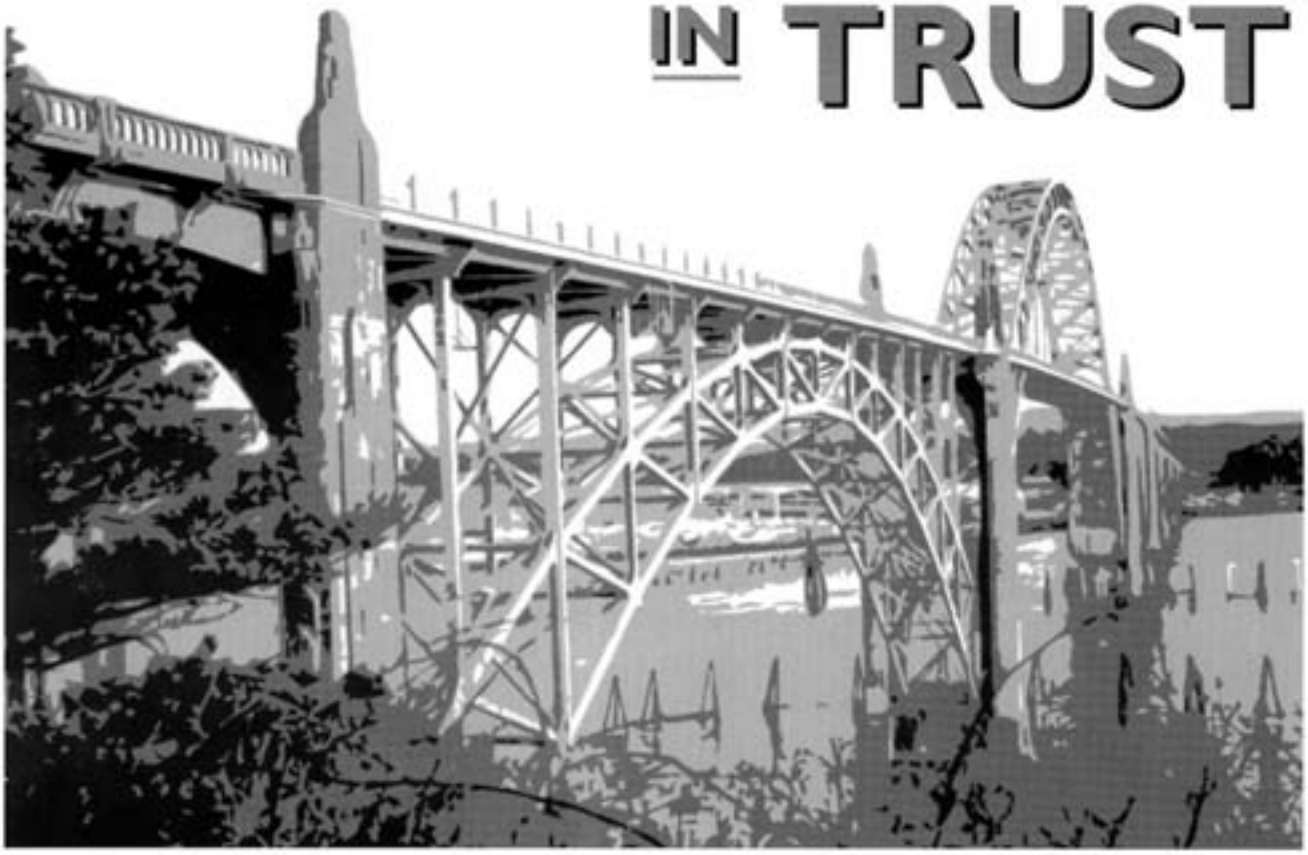
AN INVESTMENT IN TRUST



Communication in the Commercial Fishing and Fisheries Management Communities

Jennifer Gilden and Flaxen D.L. Conway

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Contents

EXECUTIVE SUMMARY

This pilot study is an attempt to look at communication between the commercial fishing and management communities in context. Following a description of the methodology used for the study, we briefly describe the current political climate and provide historical background. Next, we look at factors that complicate effective communication, existing and potential communication strategies and how members of both communities perceive their effectiveness, and how these strategies affect the relationship between the communities. Finally, we summarize our findings, offer suggestions for improved communication, and suggest possible future research activities.

The interviews for this project took place during a highly charged era when the groundfish, salmon, and crab fisheries were in distress and managers were trying to meet the requirements of the revised Magnuson-Stevens Fishery Conservation and Management Act. Interviews ranging in length from 30 minutes to 2½ hours were conducted with 29 people from all major sectors of both communities.

Issues such as competition and distrust in the fishing community, overwork and lack of funding on the part of management, confusion about agency roles, distrust and lack of respect for management, and fluctuating levels of outreach effort all complicate communications. Distrust is the biggest challenge to relations between the fishing and fisheries management communities. Distrust leads to cynicism, anger, lack of involvement and cooperation with research and regulations, and ineffective and damaging communications. Perhaps the most commonly expressed sentiment, and the one that most erodes trust, is the perception that managers and scientists really aren't interested in listening to the fishing community. This theme arose in almost every interview we conducted with fishing community members.

While all of the agency staff interviewed for this project expressed a sincere interest in communicating with members of the fishing industry, most felt constrained by lack of time, lack of funding, and bureaucracy. These constraints lessen people's ability and desire to channel efforts into ongoing communication efforts. The lack of ongoing communication during non-crisis periods may contribute to the development of new crises.

Members of the fishing and fisheries management communities all expressed doubts about the quality and quantity of data, as well as its interpretation and use. Many fishermen believe that scientists don't value the information they provide—either because they don't trust fishermen to tell the truth in their logbooks, because logbook information is too anecdotal, or because logbook data is different from what is needed by managers.

On an individual level, willingness to communicate and listen depends on personality, interest, and ability. Fishing community members often say they want scientists and managers to "go down on the docks" to talk informally with fishermen. However, many scientists and managers are not comfortable doing so. Some scientists are making a concerted effort to communicate their research methods and findings to the fishing community and to involve fishing community members in their research. Some fishing community members have observed that

scientists are trying to make themselves more accessible.

Collaborative research is the focus of much agency attention. Collaborative research can increase communication between scientists and fishermen, provide additional income to fishermen, and give fishermen a sense of ownership in management. However, truly collaborative research must involve fishing community members throughout the process of choosing research questions and planning, conducting, and reporting research.

New technologies are also changing the nature of communications. Over the past 10 years, cell phones and the Internet have vastly changed the nature of communication for many involved in fisheries. However, while many agencies are increasingly turning toward the Internet as a cost-effective and fast way to disseminate information, many fishing community members do not use the Internet extensively.

Meetings are another common way to disseminate information, but it is notoriously difficult to get fishermen to attend informational meetings. When their ability to conduct business activities is threatened, however, fishing community members are more likely to involve themselves with management concerns. In general, the more information is perceived as relating to the bottom line, the more interested and knowledgeable fishermen are about it. This becomes a challenge when scientists attempt to communicate their research to fishing community members. Although some fishermen are very interested in scientific research, many only want information that directly affects their livelihood. Scientists are not always able to answer their specific questions. In addition, processors and gear suppliers have unique communication needs and concerns that must be addressed individually.

Many other researchers, managers, and fishing community members have pointed out the need to improve communication and have tried various ways of doing so. Both communities must make communication a top priority, supported by funding, staffing, and the deep body of knowledge that already exists in industry, management, and academia.

In order for communication to become a priority, individuals, agencies, and decision makers must be educated about how ineffective communication contributes to crises, distrust, and lack of participation in management. They must be educated about the short- and long-term benefits of communication, which include more informed citizens, improved relationships, more accurate data, and greater opportunities for innovative and effective management. Regaining trust is crucial to the future of fishing community-management relations. Improved communication—which includes listening, tolerance, and both formal and informal methods—is one of the best ways to improve trust.

Improving communication between the fishing and management communities will have to take place on many levels, from individual efforts to agencywide initiatives. Appendix A provides an overview of suggestions for making communication more effective, both in the short term and the long term.

INTRODUCTION

There aren't any villains. Everybody's trying to do the right thing. Sometimes we don't know what it is, and sometimes we don't have the tools, and sometimes it's just a difference of opinion. [ZW, south coast trawler]

Studying communications in fisheries is much like studying fish stocks. Both are constantly changing, and both are influenced by distant, interrelated factors. Studying one discrete aspect of the problem (such as canary rockfish or a particular newsletter) makes it clear that all of the factors in this vast, shifting pool are interrelated. It is not enough to merely list the fish that live in the ocean or to list the communication methods that agencies use. This study is an attempt to look at communications in context and to assess the current state of communications between and among the fishing community and the fisheries management community.[1]

This is not, however, meant to be an exhaustive assessment. It was conceived as a pilot project, inspired by research done through Oregon Sea Grant's Adapting to Change project. This eight-month pilot project[2] was designed to focus on communications between the fishing community and the fisheries management community in Oregon, to create a framework for highlighting current issues and to suggest future research and communication projects. It was meant to evaluate communication strategies and tools used by fishing family businesses and fishery managers and to work toward improving communication in the future. While we still expect to achieve this goal, it has become clear that communication methods and strategies cannot be evaluated without a basic understanding of the complex and chaotic arena in which they take form.

It will come as no surprise that most people interviewed for this project feel that communication between the fishing community and management community is poor and needs to be improved. However, many do not agree on the causes of this poor communication. While some people feel the Pacific Fishery Management Council (PFMC) does a good job of communicating, others feel it does a very poor job. While some believe scientists don't want to listen to fishermen, others feel that fishermen don't want to listen to scientists. Some scientists are making a pronounced effort to communicate with fishermen, while some fishermen are making pronounced efforts to communicate with scientists. For every generalized perception of communication, there is evidence that the opposite is occurring.

Reporting succinctly on such chaos is a formidable task. This report takes the following shape: first, we provide a description of our methods, the current political context, and a brief history of communications in the fishing community. Next, we look at factors that complicate effective communication. Then we identify existing and potential communication strategies, determine how members of both communities perceive their effectiveness, and explore how they affect the relationship between the communities. Finally, we summarize our findings, offer suggestions for improved communication, and describe possible future research activities.

[1]Unless otherwise noted, the "management community" includes the scientific community and the Pacific States Marine Fisheries Commission, a tristate commission that does not have regulatory authority but does provide information and support for management.

[2]Eight months at .5 FTE, or four months full time.

METHODS

Natural-resource management usually concentrates on biological and ecological factors. Social science offers a complementary perspective by focusing on the human dimensions of natural-resource issues. To look at communications between the fishing and management communities in context, we conducted a series of semistructured ethnographic interviews with members of both communities. Ethnographic interviews are commonly used in anthropology to explore complex issues such as communication. Rather than limiting interviews to a strict set of predetermined questions, ethnographic interviews allow "informants" to help shape the interview and raise topics that otherwise might not be explored. The interviews were supplemented with participant observation, a partial review of relevant literature, and past experience working with the fishing and fisheries management communities.

We conducted interviews with 29 people. Interviews ranged from 30 minutes to 2½ hours. Interviews were selected through "snowball sampling," with the intention of interviewing people from all major sectors of both communities. The tables on the next page show the distribution of interviews (community representatives total more than 29 because some appear in multiple categories).

Notes on and limitations of this study

In this report, we often refer to fishermen, the fishing community, and the fisheries management community. We use the term "fishermen" instead of "fishers" because "fishermen" is the word used most often in the fishing community, and many women who fish prefer to be called fishermen. We have tried to avoid using the word "industry" when possible because we feel it excludes the larger community that supports and enhances the work done by fishermen. By "fishing community" we mean fishing families, fishing family businesses, fishermen and women, fishermen's wives groups, industry support groups, processors, and suppliers such as net manufacturers and gear stores. By "management" we mean the various fisheries management agencies, including staff, scientists, council members and staff, advisory group members, and other policymakers.

As noted above, this study was limited in terms of time and the number of people interviewed. Though we attempted to reach a cross-section of the commercial fishing and fisheries management communities, some geographic areas and community sectors are underrepresented in our interviews. As in almost every study, people with valuable insights were not interviewed, simply because we lacked the time and funding to do so.

In this report, we make assumptions and generalizations about both communities and the nature of communication. Further research would likely uncover more themes and lend more confidence to our findings. However, on the basis of our previous research with Oregon Sea Grant's Adapting to Change project, our experience working with the fishing and management communities in other projects, and comparisons with existing litera-

ture about this topic, we feel that our findings are sound.

To add depth and color to this report, we include quotations from interviews we conducted with fishing community members and agency staff. This is a common practice in anthropology, and we feel it adds value to the report. Unless otherwise noted, these quotations are typical of what people said during interviews. When quotations are surrounded by quotation marks, they are verbatim (transcribed from a taped interview). Otherwise, they are taken from written notes and might not be verbatim, though their meaning remains accurate. To ensure confidentiality while providing some context, we include limited identifying information with each quotation. The initials used to identify quotations were assigned randomly and have no relation to individuals' actual initials.

Geographic distribution of interviewees

North coast	9
South coast	3
Midcoast	10
Urban centers	7

Community representatives interviewed

Fishing community

Processors	2
Suppliers	2
Support organization/NGO staff	7
Trawl (includes former trawlers)	6
Troll/longline/crab	4

Management community

NMFS (includes former staff)	3
ODFW	2
Other scientists	1
PFMC	4
PSMFC	1
U.S. Coast Guard	1

Other

Extension agents/specialists	3

WHAT IS SUCCESSFUL COMMUNICATION?

"Communication is to personal health, satisfactory interpersonal relationships, and productivity as breathing is to life. Effective communication can be both taught and learned. We were not born with the way we communicate. We learned it, mostly through modeling, in ways no one even knew or intended."
—Virginia Satir (in Schwab 1989)

Communication means the sending, receiving, and assigning of meaning to verbal and nonverbal messages (Howell 1982; Collier 1995). While communication between two people is challenging in itself, complexity increases as more groups and individuals become involved. Groups develop communication styles based on their history, culture, values, socioeconomic status, and external conditions (Collier 1995). These factors are often poorly understood by outsiders, and even by insiders.

People and groups communicate to convey information and to persuade. If persuasion works, it does so by meeting the needs of those being persuaded. Effective communication results in mutual understanding and positive outcomes for all parties involved.

There is a multitude of books and articles on how to improve communication. Many focus on "active listening" and "direct expression," two keys to effective communication (Conway 1999). Howell (1982) identified several strategies for improving intergroup communication, including understanding other people's roles, observing verbal and nonverbal patterns, acknowledging politics and power issues, acknowledging history and its continuing effects, and not assuming that one's culture and identity are the standards by which others should be judged. Skills that improve communication include respect, empathy, tolerance of ambiguity, information-gathering skills, flexibility, and a willingness to be open (Collier 1995). If user participation in fisheries management is to be positive, people also must develop "participation skills" (Hanna 1996). These skills can involve setting the right pace so collaborative learning can occur, allowing for information transfer among participants, recognizing that change is incremental, committing to reaching a mutually agreeable outcome, and supporting decisions that avoid large-scale losses to any particular group.

Successful communication may involve working toward improving a particular situation rather than solving a specific problem. This involves understanding one's own priorities and values as well as those of other stakeholders, understanding the interdependency of stakeholders, and using skills and tools that help groups interact positively and learn together. The concept of improving situations rather than solving problems was described by Svein Jentoft (1999) in the journal *Fisheries*. Jentoft offers an interesting and compelling argument for the importance of the fisheries management community's gaining a better understanding of the fishing community and using this understanding to improve management practices and decisions.

While listing communication techniques is helpful, a larger perspective of communication context is also important. People communicate from their own frameworks and worldviews, which are based on past experiences, values, perceptions, and a multitude of other factors (Haney 1973). The challenge lies in communicating meaning. In fact, the work of communication is in knowing what meanings other people hold and how these meanings can be used to construct an intended message (Howell 1982).

> *The environmental community has a different definition of marine protected areas than managers and fishermen do....We use the same words, but don't mean the same things. [PC, north coast trawler]*

Perception is the process of adding meaning to incoming messages. Often, perception has little to do with reality. Misunderstandings based on false perceptions can lead to lack of trust, defensiveness, resistance, false assumptions, stereotyping, and failure to see alternatives or gray areas (Haney 1973; Howell 1982). Each of these misunderstandings is present in communications between the fishing and fisheries management communities.

The next section explores the context in which communication now occurs.

Active listening

When people deal with difficult issues, listening is more important than speaking or any other form of expression. There are several models for active listening. Zinkin (1993) provides the following five-step model:

1. Acknowledge the feelings of the speaker first ("Sounds like you're very frustrated").
2. Repeat in your own words what the speaker is saying.
3. Ask open questions to make sure you understand what the speaker is saying. Use questions beginning with "what," "how," "please explain," or "describe."
4. Summarize and clarify what the speaker is saying.
5. Ask whether the speaker wants to hear your opinion. Then offer your opinion with great caution.

In addition to ensuring that meaning is conveyed and received, active listening strengthens the relationship between the parties communicating.

Direct expression

The other half of the communication equation is direct expression—expressing what one thinks, wants, and is willing to give in a clear, true, and nondefensive manner. The key to direct expression is using "I" statements, which allow you to share what you think or feel without blaming or attacking others ("I don't feel listened to" as opposed to "You're not listening to me"). For more tips on active listening and direct expression, see Conway (1999).

CONTEXT AND BACKGROUND

"State and federal agencies, 15–20 years ago, took up 5–10% of my time. State and federal agencies today take 50–60% of my time. And sometimes…75–100% of my time….Simply because there's more regulation, and it's more complex. And because of that we're dealing with more and more time that is devoted to working with the state and federal agencies than is devoted to working on the floor." [GU, north coast processor]

Like all other aspects of the fishing and fisheries management communities, the history of communication between management and the fishing community is complex and has been influenced by a multitude of factors. Funding levels, the perceived intensity of fishery crises, organizational values, organizational structure, administrative appointments, public policy, and individual personalities all affect the character of communication.

Communication styles are changing. Although many agency staff and fishing community members believe that communication was better in the past (the 1960s and 1970s), there is a new emphasis on collaborative research and a new emphasis on acquiring social data. A slow and subtle shift appears to be replacing top-down management with more cooperative forms of management. However, the vast majority of our interviewees expressed the belief that communication between fishing community and management must be improved. The current atmosphere of crisis, distrust, overwork, and lack of funding contributes to this perception.

New technologies are also changing the nature of communication in the fishing and management communities. Voice, telephone, VHF, and the written word traditionally have been the primary communication methods used by the fishing community. In the past 10 years, however, cell phones and the Internet have vastly changed the nature of communication for many involved in fisheries. The quick spread of the Internet has important implications that will be described in more detail in the section on communication methods.

Political context

The interviews for this project took place during a highly charged era in West Coast commercial fisheries. The salmon fishery had collapsed in the mid-1990s, and many salmon fishermen had moved into other fisheries such as groundfish and crab. Now, fishing community members are navigating a 50 percent reduction in the groundfish fishery, a disappointing Dungeness crab season, and potential cutbacks to pollock fishing in Alaska. New management measures are under discussion: permit stacking in the sablefish fishery, regulation of highly migratory species fisheries, marine protected areas, individual transferable quotas, electronic logbooks, and new collaborative research projects.

Groundfish have been the backbone of the West Coast fishing industry for some 20 years. After a period of full utilization and overcapitalization, the Pacific groundfish fishery declined

rapidly. In Oregon alone, commercial groundfish landings contributed $66.6 million (real 1999 dollars) in personal income to the economy in 1989, but this decreased to $42.2 million in 1999 (Radtke and Davis 2000).

The economic consequences of the groundfish decline are being felt throughout coastal communities—from fish plants, ports, support services, and charter boats to the community at large. The change and uncertainty facing the entire fishing community is unprecedented and will likely be even more traumatic than the salmon crisis.

The 1996 revisions to the Magnuson-Stevens Fishery Conservation and Management Act made as part of the Sustainable Fisheries Act recognized that this transition would be painful. The act included provisions for fisheries disaster relief, fishing capacity reduction programs, vessel financing, and grants and other financial assistance. National Standard 8 called for conservation and management measures to "take into account the importance of fishery resources to fishing communities in order to (a) provide for the sustained participation of such communities and (b) to the extent practicable, minimize adverse economic impacts on such communities." This task was made more difficult by the fact that no funding was included with the act.

> *"When I started fishing in the late '50s, early '60s, I started fishing, and you were a salmon fisherman. That's what you did. You were a crabber. That's what you did. Crabbing was 11 months a year. Salmon fishing was 10, 11 months a year....And then they...put seasons on it, so what am I gonna do for four months?...And so crabbers became shrimpers." [LD, north coast supplier]*

As the movement from salmon into other fisheries testifies, changes in the fishing economy require people to diversify. In turn, this diversification creates new pressures on other fisheries and new needs for information. Fishermen need information relevant to their particular fishery, and if a previously unregulated fishery becomes regulated, they need information about how to comply with new rules and how to be involved in the regulatory process. If they choose to stay in the fishing industry, they may need information about getting involved in fishing surveys and other research projects. If they leave the industry, they need information about job retraining, continuing education, loans, and other tools to begin a new life. Support businesses also diversify in order to support themselves. In Astoria alone, a net maker has begun selling soccer nets on the Internet, a marine supply store repairs motor homes, and a metal fabricator builds wrought-iron bird cages.

Agencies also must adapt to economic downturns and constant change. While much of their workload involves responding to the demands of the fishing community, they also must respond to the public, to environmental groups, and to the directives of state and federal representatives, politically appointed agency heads, and federal administrations that change every four to eight years.

> *"I'm 45 now, and I feel like I should go back to school and start over again....I'm not prepared...it's just a different world we're dealing in, but it's also an exciting time." [FT, NMFS Seattle staff]*

Stress and emotion rise with fishery disasters. These stressors have important implications for communications. Economic and administrative stress reduces the capacity of organizations and individuals to communicate. As a result, the quality of communication decreases, and connections and relationships are damaged. Research confirms the importance of effective communication during times of change and transition, but leaders may fail to follow this advice because they are either unable or unwilling to channel their efforts into communication (Conway et al. 1996).

Because outreach and education are long-term efforts with vague, immeasurable results, they are often the first efforts to be cut when staffing and funding are low. In addition, fisheries organizations and agencies are often funded through taxes or fees levied on industry participants. During economic downturns, this income decreases, lowering organizations' ability to communicate information to their members or to act as communication clearinghouses. The informal, face-to-face discussions that dominate communication within the fishing community can easily amplify anger, fear, and rumors in the absence of accurate and appropriate communication by agencies and organizations. In turn, this miscommunication may increase the likelihood of future crises.

Who needs to communicate?

Communication is conducted differently at different levels of the fishing and management communities. Fishermen, fishing family members, fisheries representatives and support organizations, suppliers, processors, sellers, nongovernmental organizations, agencies, scientists, the Coast Guard, Extension agents, local governments, environmental groups, and the public all have different information needs, styles, and methods. While it is beyond the scope of this report to describe all the information needs of each group and individual, the basic needs and information sources of the major participants are included in Appendix D. Below, we will examine the diversity of fishing community members in further detail.

The fishing community: a tradition of competition

When members of the general public think about commercial fishing, they often visualize a man in a slicker staring out to sea. Although most people holding commercial fishing licenses are male, a large number of them are women. For most professional fishermen in Oregon, fishing is a family business. Strong family ties help fishermen manage the daily strains of their profession (Dixon et al. 1984; Smith and Jepson 1993). While the fishermen are at sea, the "onshore" partner of the fishing business and family often works independently to keep the family together, manage the business and family finances, provide emotional support, and conduct other activities to support the business (Davis 1986; Smith 1995). Fishermen's wives are increasingly active in support organizations such as commodity or gear groups (for example, the Oregon Trawl Commission), local fishermen's wives groups, and coastwide groups such as the Pacific Marine Conservation Council (PMCC) and the Women's Coalition for Pacific Fisheries (WCPF). As more fishermen's wives take on additional employment,

repercussions are felt within the family business and the local community.

Active commercial fishermen comprise various gear types, geographic regions, target fisheries, levels of expertise, and levels of involvement in management. Each of these factors, and the perceived level of crisis in the fishery, influence fishing community members' communication needs and their awareness of regulatory issues. Because of the salmon and groundfish crises, fishermen in general are well aware of the issues surrounding the industry. However, the highly regulated groundfish fishery has different information needs and concerns than the albacore fishery, which is just on the verge of becoming regulated. Because the groundfish fishery is experiencing a difficult transition, people in the groundfish industry are also more likely to seek out information about regulations and management. People in fisheries that have a history of regulation are generally more knowledgeable about the process of representation through the PFMC ("the Council process") than those whose fisheries have not been regulated. The latter must be educated about the process in order to participate effectively.

Boat owners, captains, and crew also have different communication styles and needs. Owners and captains tend to be more informed, more active in getting information about the industry, and more involved in management—they actively seek the information they need to run their businesses, and many lobby for their own or their industry's interests at management meetings. However, even within the population of owners and captains, levels of knowledge and interest vary widely. One experienced trawler explained that communications in the industry are stratified by experience and success at fishing. Successful fishermen are more likely to communicate with one another than with less successful fishermen or with crew. As he said, "if you can reach someone in each group, you can get the word out."

Within a single strata, there is also diversity of knowledge. Another experienced trawler noted that "The farther back you go from the knowledge [fishermen] have to have that affects their living today—this trip—the less distinct does their knowledge become." This tendency to focus on the immediate, and the reasons behind it, will be discussed in further detail below.

The challenge of reaching crew members

Several agency staff noted the difficulty in getting information out to crew members. There are several reasons for this. The most obvious reason is that there is no central registry of crew members in Oregon, so no complete mailing list of crew members exists. Developing a database of crew members would certainly make it easier to reach them; however, other issues complicate the matter.

The current challenges to the fishing industry have discouraged many people from getting involved in fishing. Many crew jobs pay poorly, and the vast majority offer no benefits or insurance. At the same time, they require extremely hard work and subject crew members to a high level of danger and discomfort. Publicity about the fishing industry—for example, the recent announcement that fishing may be the most dangerous occupation in the world—adds to the undesirability of working as crew (UN FAO 2001). While responsible, professional crew

certainly exist, many people who do seek work in the fishing industry lack other employment opportunities. For them, working as crew is merely a job, rather than a lifelong pursuit; as a result, they lack attachment to the industry's culture. Crew members whose interests are limited to earning their wages are unlikely to make the effort to get on an agency's mailing list. Those who are strongly interested in fishing are likely to become skippers or owners, rather than remaining crew:

> *"Crew members have access to information if they're interested in getting it. But if they're that interested, they're usually not crew members. Why would they want to know?" [GD, north coast trawler]*

Owners and captains report that it is difficult to find and keep the type of professional crew who are likely to move up in the industry:

> *"When I fished in 1980…a crewman on my boat made $40,000 plus a year. That was a lot of money in 1980. Now…the same guy is lucky to make $30,000 and he's gotta pay his own taxes…and Costco starts at ten bucks an hour and you don't have to think, and you don't worry about it sinking on you." [LD, north coast supplier]*

> *You can find crew, but whether they can work is questionable. You can always find people, but a lot of them are alcoholics or on drugs. I went through four fish pullers one year.…This year, because there are no crabs, they lost a lot of crew members because they had to get other jobs. They couldn't make it. [LW, south coast troller]*

Captains' relationships with crew members also affect their level of knowledge. Captains appear to act as information gateways, providing crew members with information they feel the crew should know. Sometimes captains limit this information because they don't want to unnecessarily worry their crew or because they want crew to concentrate on their jobs.

> *I don't always inform the crew about what's going on because I don't want to alarm them unnecessarily. It's a "need to know" type of thing. I wait and see what the news is, and by then it's become public knowledge anyway. I have one kid who wanted to come to the council meeting, but I wanted him to work. [LE, north coast trawler]*

Many agencies and organizations would like to increase their access to crew members. Crew members and others in the fishing community are often unaware of social support agencies and outreach programs that provide useful services to people in transition.

Internal conflict and secrecy in commercial fishing

> *On the ocean, the less said the better. That's my policy…If fishermen communicate with each other, it's in small groups face to face. [LE, north coast trawler]*

Competition and distrust are part of a cultural and economic pattern that can be found in many different levels of the fishing community. In addition to competition between individual vessels, competition and conflict occur between northern fishermen and southern fishermen, commercial and recreational fishers, trawlers and fixed-gear vessels, trollers and crabbers, and large boats and small boats. These conflicts arise from limited biological resources, ineffective management,

poor communication, and differing values.

Internal conflict hampers communication within the fishing community, and between the fishing community and other groups. Although some multigear organizations exist, most industry organizations focus on one particular gear type or fishery. These groups can contribute to divisiveness by separating people based on their fisheries or gear types and inhibiting their ability to work with other groups. By looking out only for their own interests, both individual fishermen and the community as a whole lose the opportunity to present a unified front to management or to the general public.

> *Fishermen are their own worst enemies. When the Boldt Decision came down, nobody cared but the salmon fishermen. Now people are realizing it affects everyone. We should have all bonded together. [GD, north coast trawler]*

Perhaps because of this realization, some people see the Oregon fishing community becoming more cooperative as a result of fisheries crises:

> *"The issues more and more are shared....I think people are seeing now that the groundfish problem isn't just a problem if you are a trawler. Shrimpers are effected, crabbers are effected, trollers are effected. So you have a force that tends to herd all your wildebeests into one corral." [PT, midcoast troller]*

One noticeable theme that emerged during interviews was fishermen's hesitation when talking about certain topics such as bycatch and full retention. Bycatch is a sensitive issue, and several fishermen expressed dismay about discarding unwanted fish. Fishermen are cautious when talking about this issue because they don't want to be seen as antitrawl, and they don't want the public to blame the fishing industry for bycatch. These fears limit communication about this touchy issue.

> *There are a lot of fish out there, but management doesn't know what's in the ocean. We throw away half of it. But we can't talk about it because people don't understand it, and they blame the fishermen. [LE, north coast trawler]*

> *"—I don't care what anybody says, there has to be a solution [to the bycatch problem]. Some of us know what it is; the people don't like it, and so it isn't gonna happen.*
>
> *—What do you think it is?*
>
> *—Oh-hoh...we're on tape now. Oh, I know the solution. It's a joint venture solution, and it involves telling people how to run their lives, and people don't like being told....You should have to keep what you catch." [LD, north coast supplier]*

The fact that the fishing community lacks a unified voice also means that agencies must deal with the community's many conflicting priorities and information needs, which leads to duplication of effort.

Processors and gear suppliers

Processors and gear suppliers have unique communication needs and concerns. Both need timely information to plan for their businesses. Quick changes in regulations make planning difficult and can lead to financial loss. For example, gear stores that must order supplies far in advance are at the

mercy of regulatory and judiciary decisions:

> *"These days, we hinge upon what decisions are being made, and when they're made....You're talking six to eight months to get a product. We get our crystal ball and go, phew, how much money are we gonna throw at this? Thank God for [Alaska Senator] Stevens this year, because we had thrown our crystal ball out and ordered some cable." [VT, midcoast supplier]*

Similarly, processors find planning difficult in the face of regulatory change:

> *The system has to be changed so we don't have 23 regulation changes in one year. It sets us up for failure. We have to pay fines, or close the plants....We can't budget like a normal business. I sympathize with the lumber companies that get a contract and then have to deal with someone chaining himself to a tree. [VY, north coast processor]*

Processors need to be in constant communication with fishing vessels in order to plan ahead for marketing the catch and to inform vessels of their catch and bycatch limits. The processors we spoke with communicated with vessels by radios, fax, and cell phone. Processors are required to advise vessels daily about their catch levels. If levels of bycatch are high, they can advise vessels to fish in a different area to avoid surpassing their quotas.

Fish processors are in a unique position, relative to other food processors, in that they can be fined if their suppliers bring in too much of their product. Vessels also lose fishing days if they exceed their limits. Because of this, processors need timely and accurate information, which they get from agency faxes, Web sites, phone conversations, and information sent out by the West Coast Seafood Processors' Association. Processors are also expected to glean regulatory information from the *Federal Register*, which they say is difficult. Processors stress the need for agencies to keep their Web sites up to date. If Web sites aren't up to date, or if a technical glitch occurs—as recently happened with an Astoria processor whose fax machine ran out of paper—processors can miss an important piece of information that results in their being fined.

Developments on the Internet are adding pressure to the processing business. Safeway and other large retailers have begun accepting purchase bids on-line. Retailers will post a request for bids for a certain amount of fish; processors bid for it; and the lowest price and fastest bid gets the sale. This has increased competition among processors, and some believe that it decreases the value of the product because decisions are made solely on the basis of price, rather than quality. In addition, "lowballers" with poor-quality fish lower the price for all processors. On-line bidding speeds up the process of buying and selling fish but weakens the relationships that have been built over time between processors and retail buyers.

Agencies: overworked and underfunded

The theme of overwork emerged in almost every interview conducted for this study. Both agency staff and fishermen said they felt there was too much to do and too little time to do it.

In part, this is due to larger cultural and technological trends, such as instantaneous communication and longer working hours (Families and Work Institute 1997). More specifically, it is due to agency funding, staffing, and mandates. Agencies are under a great deal of pressure to comply with federal and state requirements, yet they often lack the funding to do so.

All of the agency staff interviewed for this project expressed a sincere interest in communicating with members of the fishing industry. However, most of them also felt constrained by lack of time, lack of funding, and bureaucracy. For example, the Paperwork Reduction Act, which was originally designed to minimize the paperwork burden for individuals, slows federally funded agencies in their ability to conduct surveys. While it is still possible for federal agencies to conduct surveys, the Paperwork Reduction Act has effectively created a new level of bureaucracy for federal employees wanting to conduct research. State agencies such as the Oregon Department of Fish and Wildlife (ODFW) are not limited by the Paperwork Reduction Act and do conduct surveys to improve their customer service.

Information overload is also a common problem among agency staff and PFMC members and staff. PFMC members are routinely asked to read and understand thick volumes of briefing materials. In addition, the use of the Internet contributes to information overload by quickly delivering large amounts of data—much of which is not useful—directly to people's workstations.

Agencies play a number of important and interconnected roles in the marine fisheries arena. In fact, the roles are so interconnected and complex that many people are unclear about which agencies do what. Clarifying agency roles and responsibilities—for the public, the fishing community, and other agency staff—is thus an important part of communications.

> *"In a perfect world, I could push a button and people would understand who the Council is, and the role they play in the management of West Coast fisheries. Because…I'm not sure if the people in the Portland NMFS office know what the Council does, what their role is in the process. So it's not just informing a guy at the café who wants to go out and catch fish." [VE, PFMC]*

> *People kept saying "It's good to see NMFS people on the docks—we haven't seen a NMFS person on the dock for 15 years." [VJ, PSMFC]*

Despite the confusion, most fishing community members have strong opinions about which agencies are good communicators and which are not. These attitudes are closely related to whether agencies are involved in regulating controversial and crisis-ridden fisheries and to what extent agencies are perceived as listening to the fishing community. Most of the people interviewed for this project feel that ODFW is more successful in communicating with the fishing community than are other agencies. Less positive remarks were reserved for the National Marine Fisheries Service (NMFS) and the PFMC. The Pacific States Marine Fisheries Commission (PSMFC) was considered a neutral supplier and collector of data—as one person put it, "the Switzerland of agencies"—and people were unlikely to refer to it at all. Interviewees spoke

very positively of Oregon Extension Sea Grant, which has no regulatory power, and whose primary purpose is to educate.

The National Marine Fisheries Service

There's so much going on here in terms of getting paper out, in terms of getting certain things done, that…you work with industry when you have to….We miss [going on the docks]. We'd like to do more of it, but again it's outside–it's not task-oriented, if you will. It's one of those other duties, it's kind of a 'nice to do,' but not [considered necessary]. [FT, NMFS Seattle staff]

Many people in the fishing community love to hate NMFS. Whether the vitriol is deserved or not, it has a damaging effect on agency morale and colors the fishing community's perceptions of all other agencies.

NMFS is made up of many parts, each with different responsibilities. The parts are easily confused. The national office of NMFS (also called NOAA Fisheries) oversees the offices of Constituent Services, Sustainable Fisheries, Protected Resources, Habitat Conservation, Science and Technology, and Management and Budget. At the same time, NMFS has regional offices in the Northeast, Southeast, Southwest, Northwest, and Alaska. Each regional office is connected to a Science Center, which is responsible for providing scientific and technical support for management. NMFS' Northwest Regional Office and Science Center are both in Seattle, but the Science Center also has field stations in Newport and Hammond, Oregon; in Pasco, Mukilteo, and Manchester, Washington; and in Kodiak, Alaska.

At this writing, the National Marine Fisheries Service is involved in 102 non-enforcement-related lawsuits nationwide, which absorb staff time and make the agency's focus more reactive than proactive (NOAA Fisheries Office of General Counsel, personal comm.). At the same time, 50 percent of NMFS's staff is expected to retire within the next five years (McGovern 2001). Although funding in some sectors of NMFS has increased recently, funding for administration and facilities is problematic. As a worker at NMFS's Sustainable Fisheries Division noted, "Last year, there was just enough money in the region to pay for everybody's salary and benefits. We had a moratorium on all travel, all spending for a good six to eight months, and that was the way it was in every region." For the past few years, NMFS's Northwest Region has been preoccupied with salmon and habitat issues. As a result, hiring has focused on salmon biologists and habitat specialists, who have other priorities than reaching out to the commercial fishing community.

Although salmon recovery accounts for most of NMFS' 2002 budget request (more than $100 million), the agency is beginning to focus more on groundfish. The budget request includes $10.6 million in new funding to "enhance and modernize NOAA Fisheries' activities in the Northwest." This includes expanding the groundfish observer program, conducting more frequent groundfish stock assessments, collaborating with constituents, and increasing (by a small amount) social science research.

NMFS's administrative structure influences its capacity to communicate. Though our conversations with Seattle NMFS staff were limited, it seems safe to say that internal commu-

nications and morale are low; indeed, one employee described internal communications as "abysmal." Lack of recognition by management, combined with a lack of staff meetings and other opportunities for employees to build working relationships, appears to be eroding the agency's morale, energy level, and capacity to adapt to change. Frequent turnover of administrators creates uneven management styles and structures, and the political nature of high-level appointments can mean that directors are chosen for reasons other than their administrative skills.

> *What's frustrating for me and for a lot of other employees here is…when you don't have any recognition…when you don't have regular staff meetings, you lose the feeling that what you do [has] any meaning….One of the complaints of the old-timers is that we don't even know who the new people are, what they do. We don't know where we plug in anymore. And in fairness to the managers…what's expected of them is enormous, but what shakes down after a while is you feel like you're almost an independent contractor working in kind of an isolated cubicle for the government; you're not part of a group. [FT, NMFS Seattle staff]*

It should be noted that these comments might not apply to other NMFS facilities. NMFS's Northwest Region includes the Sustainable Fisheries Division and Northwest Fisheries Science Center in Seattle, the Habitat Conservation Division, Protected Resource Division and Hydropower Division in Portland, and multiple field offices, field stations, and enforcement offices. Our research was too limited to provide insight into morale and administration at these other NMFS facilities. However, it would be reasonable to expect that these branches of NMFS are also influenced by lack of funding and high-level administrative decisions. A more thorough study of NMFS's internal structure, including the quality of communications between its scientific and management wings and between different geographic locations, as well as its values and organizational capacity, would be extremely helpful in understanding its communication with the fishing community and other agencies.

The Oregon Department of Fish and Wildlife

Like NMFS, the Oregon Department of Fish and Wildlife (ODFW) also suffers from limited funding. In addition, the agency is shifting its outreach efforts to focus on the Oregon Plan for Salmon and Watersheds. A staff position that was specifically devoted to marine program outreach was cut three years ago and has not been reestablished. Funds for outreach come from recreation dollars, and no funding has been allocated to develop another marine outreach position. As a result, outreach efforts are the responsibility of "everybody and nobody."

An independent review of ODFW's management noted, "While federal funding for natural resources has increased and new funds may be on the horizon due to ESA listings and the Conservation and Reinvestment Act, many of these funds are restricted for specific activities and can't be relied upon as long-term revenue sources to achieve ODFW's broad, statewide mission" (Aldrich et al. 2000). As a result, the agency is undergoing a restructuring process.

Despite these challenges, ODFW enjoys a more positive reputation

among sectors of the commercial fishing community than do other agencies. This may be due, in part, to the fact that ODFW is seen as more willing to listen to commercial fishermen. Past successes by outreach staff contributed to this perception. ODFW holds regular meetings to gain input from fishing industry members before council meetings, though attendance at these meetings is not as high as it used to be when salmon were under discussion.

ODFW places a high value on customer service, in part because it is funded through user fees. In ODFW's January 2000 customer service action plan, the goals outlined include "ease of doing business; partners feel a part of ODFW decisions; partners have been heard and had opportunities to express opinions; (and) partners feel valued." ODFW employees at many levels attend customer service training. The agency also maintains a Web site (which processors say isn't updated often enough) and sends out mailings targeted by gear type, as well as faxes and e-mails detailing regulations. While other agencies also have customer service policies, the fishing community members we spoke with felt that ODFW was more successful in its customer service than other agencies.

Another reason ODFW may be viewed in a more positive light is that ODFW port biologists regularly talk with, and listen to, fishermen on the docks. Permanent and part-time port biologists are stationed at most Oregon fishing ports. When they gain the trust and respect of the fishing community, they can enhance the agency's image and the effectiveness of its communications.

[The "logbook guy"] is well liked in the fleet, as far as I know. There's no problem there. He was my daughter's baseball coach for a few years. Real nice fellow. [LD, north coast supplier]

The role of port biologists in communication will be explored in further detail below, in the section on liaisons.

The Pacific Fishery Management Council

"I think the council system on the west coast—the PFMC—has been all in all a really good system to work with. Good from the standpoint that all the people are concerned, and really working to do the right thing, to do a good job." [GU, north coast processor]

"I could talk for over an hour on the council. I'm firmly convinced they should all be fired." [WT, midcoast trawler]

Because the Pacific Fishery Management Council (PFMC) process has so much influence over the commercial fishing industry, it inspires strong and varied opinions by fishing industry members. Below, we explore some basic themes regarding the PFMC and communication. Relations between the fishing community and the PFMC are discussed in more depth in the sections on trust, listening, representation, and meetings.

Participants in a roundtable discussion about improving federal fisheries management recently agreed that "the Pacific Council is grossly underfunded and understaffed" (H. John Heinz III Center 2000). Most importantly in the context of this report, the PFMC has no staff position specifically dedicated

to outreach and communications. Administrative staff oversee the PFMC's mailing list and Web site, while other staff members write articles for the PFMC newsletter on their specific areas of expertise.

> *"Right now the Council doesn't have enough money in the budget to handle the technical fishery management stuff, let alone communications." [PL, PFMC]*

The PFMC newsletter is considered by the fishing community to be an important source of information. While many feel that it is too slow, some note that the newsletter's timeliness is improving, and it is now available on-line and through e-mail. The PFMC is increasing the effort it puts into Internet communications, and as of March 2001 the number of visitors to its Web site had increased 144 percent. The PFMC has begun accepting testimony and comments by e-mail, but staff say that, apart from mass e-mails sent by organized lobbying groups, the number of e-mail comments received from the fishing community is quite low. The PFMC also sends out meeting notices targeted by fishery (salmon, highly migratory species, groundfish, and coastal pelagics).

As in other agencies, PFMC members and staff must contend with heavy workloads and high expectations. Most PFMC members have full-time jobs in addition to their PFMC duties.

> *"To go back to how we could make things better, I think having more Council staff would be one thing. Right now, we're just overwhelmed. I've got three different fishery management plans that I track, plus stuff that goes on within. So I get a phone call from somebody about a [fish] net, and I have to think, what do I have to put aside?" [VE, PFMC]*

> *"Council members are also expected to do a lot....Typically we mail [information] out about ten days before the Council meeting starts. So [the Council members] have roughly a week. If they dropped everything, they probably couldn't complete everything in the book. And sometimes it's worse....There's no way anybody can get it all." [PL, PFMC]*

One important activity that absorbs PFMC staff time is educating people about the process. People who are new to the process, or who come from industry sectors that are just becoming regulated, need to be educated about the difference between state and federal permits, what happens at PFMC meetings, and the relationship between the PFMC process and state and federal management. Educating people about the process helps fishing community members participate more effectively and reduces frustration for both fishermen and staff.

One theme that emerged during interviews was the importance, for the PFMC, of being clear about why decisions are made, and being clear and forthright about negative developments in the fisheries. Several people interviewed for this project noted that the PFMC had missed, or avoided, making hard decisions in a timely manner. While the reasons for this perception are beyond the scope of this research, it serves as a reminder that effective communication makes known bad news as well as good news.

PFMC meetings, and the communications that occur during these meetings, will be discussed in further detail in the section on meetings.

ISSUES THAT INFLUENCE COMMUNICATION

The following themes emerged during interviews. These themes influence, and sometimes hamper, communications in all sectors of the commercial fishing and management communities.

Priorities, the bottom line, and crisis management

> *"Since we're in such volatile, politically driven waters, what's the point of thinking for the long term? People are just trying to get done what needs to be done tomorrow or next week. It's easy to find fault with that; [but] if we were in their shoes, we'd probably do the same thing." [YE, Extension agent[1]]*

The information needs of members of the fishing community are directly related to their priorities. For most, the top priority is conducting their business in such a way that they can earn a living. To do so requires basic information about the day-to-day aspects of running a fishing operation. In general, the less information is perceived as relating to the bottom line, the less interested and knowledgeable fishermen are about it. This becomes a challenge when scientists attempt to communicate their research to fishing community members. Although some fishermen are very interested in scientific research, many only want information that directly affects their livelihood. Scientists are not always able to answer their specific questions:

> *"When scientists meet with fishermen, often the fishermen want bottom-line information that affects their work, and scientists aren't working on that level so they can't answer their questions. They may go and get the information and bring it back, but that takes a while." [JI, NMFS]*

If communication relates to a perceived threat—such as a proposed regulation—that seems vague or distant, the majority of fishermen are unlikely to pay much attention to it until it becomes a concrete necessity. The same holds true for involvement in fisheries management: most fishermen will not get involved in the regulatory process until they see that it directly affects their bottom line.

> *"You've got a faction out here that doesn't want to deal with [management]. It's not their thing. I think it's getting better than it used to be by quite a bit, because everybody's realizing 'we better start thinking about paying attention....'" [VT, midcoast supplier]*

Some fishing community members attribute this avoidance of management to denial, and some to fishermen's unwillingness to deal with "unnecessary" bureaucracy. While these may be contributing factors, this pattern probably has a lot to do with the way fishermen set their priorities. They may see scientific information as important (though concerns about data quality also influence their perceptions of science), but more urgent and immediately rewarding business concerns are given a higher

[1] *In order to ensure confidentiality, we have not included location information for Extension agents.*

priority. Like agency staff, fishermen are busy people:

> *The amount of information you need depends on your degree of involvement. It takes a lot of time to be a good fisherman, and the time it takes to communicate (like going to council meetings) is time away from fishing. [LE, north coast trawler]*

The importance of the bottom line is reflected in meeting attendance. It is notoriously difficult to get fishermen to attend informational meetings. When the ability to conduct business activities is threatened, however, fishing community members are more likely to involve themselves with management concerns. Not surprisingly, they also express more interest in outreach programs and career alternatives when crises occur.

> *"When we have a really hot issue, like on crab, we will have 60 to 75 people in every port that we go in. If it's something where you're going to talk about regulations, something like the crab fishery, you'll get a big turnout. Similarly, if we go down [to Port Orford] and talk about urchins, you'll have almost all the permit holders in the room." [PL, ODFW]*

Agencies also devote more effort to communication during crises. Part of this is due to way agencies are funded. Congress and legislatures are more likely to provide funding after a disaster has been declared:

> *"The times that I have been able to be part of fisheries research usually has been in response to a disaster. It's sad but true, but most of the time there is not enough funding and willpower to go out and actually measure the fisheries and do the research. When we do, it is because of a disaster" [PT, midcoast troller]*

The overwork, understaffing, and underfunding described above also lessen peoples' ability and desire to channel efforts into communication. Finally, the human tendency to focus on short-term problems over long-term processes influences communication efforts. For both management and the fishing community, communication efforts peak during crises, and ebb as crises lose their urgency. In turn, the lack of communication during non-crisis periods may contribute to the development of new crises.

It should be noted that some organizations made a strong effort to communicate during the recent groundfish disaster. Extension agents and programs, such as the Groundfish Disaster Outreach Program (GDOP), were especially focused on this effort. The GDOP uses fishing family members as liaisons to reach people involved in the groundfish industry. Staff involved in the GDOP feel they have been successful in reaching fishing community members:

> *"Without a doubt, fishermen and fishing families are much more aware of community resources available for them than they were before the GDOP. There is much less confusion and bitter feelings about 'help' resources under the groundfish disaster than under the salmon disaster." [LM, Extension agent]*

A scientist unaffiliated with the GDOP noted his surprise that fishermen weren't more upset about the groundfish disaster:

> *"The fishermen were being prepared well in advance to know what was*

coming....There is some screaming, fishermen and others have been screaming, but compared to the uproar that occurred in New England, there's been none of that that I can see. There's no fisherman strikes, you don't have fishermen dropping loads of rotting herring on the steps of Salem or something. So maybe all these attempts at educating worked." [VI, midcoast scientist]

An evaluation of the GDOP, planned for the near future, should offer helpful insights into communicating with the fishing community during periods of stress.

Trust, listening, and willingness to change

"What's really important, I think, for almost anybody that's trying to do things with fishermen, is to develop enough of a relationship, or a series of relationships, so that you can become known and trusted. And if not trusted, known." [WT, midcoast trawler]

Distrust is the biggest challenge to relations between the fishing and fisheries management communities. Mayer (1990) writes that trust is built by dealing with others openly, without manipulation or guile. Trusting requires a willingness to be open and the courage and confidence to be vulnerable. People in some sectors of the fishing community feel extremely vulnerable to management decisions, so trusting those decisions is extremely important:

For the last year, fishermen thought we were fitting into the council's plan. Now, they're changing the plan on us. When we come here, it's a really intense experience....Our whole livelihood depends on what they decide here. [LE, north coast trawler]

Distrust leads to cynicism, anger, lack of involvement, lack of cooperation with research and regulations, and ineffective and damaging communications. Although distrust for some agencies is greater than for others, it influences relations with all agencies, organizations, and research efforts. This distrust can be broken down into several themes. While the perceptions on which these themes are based may not always be accurate, the results are very real.

First, many fishing community members distrust the PFMC process and believe that not only does it not protect their interests but also works against them. Part of this stems from a lack of understanding about the PFMC process, and part of it is based on animosity toward NMFS, which colors perceptions of the PFMC. The rest comes from people's experiences and perceptions regarding PFMC actions and the representation process. People who distrust the process also distrust the decisions that result from the process.

Some fishing community members believe that management purposely wants to keep fishing community members uninformed. This perception is a direct result of outreach and communications efforts not reaching their target audience:

"How can the Council conduct public meetings but not publish the meeting time and location in local newspapers?....It would seem that

if NMFS, the Council or ODF&W really wanted public comment on these hearings then attempts would have been made to announce the meeting location and time" [Comment on draft strategic groundfish plan]

Third, distrust arises when people feel that regulations are unfair. Often this perception arises from intergear conflicts.

Fourth, many fishing community members distrust management because they feel it is incompetent and dishonest. This belief often arises because fishermen's observations at sea do not match management assessments. This topic will be explored further in the section on data.

When the 200-mile limit came into effect, people felt positive about the industry and there was a lot of capital construction. But there was a lot of mismanagement. The industry was led astray....For the last 25 years we've only caught what the government has told us to catch, and now we're getting hammered. [VY, north coast processor]

Another perception that may be less common, but is still pervasive, is the belief that managers and scientists don't want to solve the problem because then they would be out of a job:

"What is the management council really gonna do for a living after they've gotten rid of us all? Have to get real jobs? It doesn't make sense, does it? It's like biting the hand that feeds you." [LD, north coast supplier]

The bureaucrats and scientists don't want to fix the problem because it brings in money. The problems create jobs. [PC, north coast trawler]

This cynicism reflects the fishing community's feelings of vulnerability and helplessness in regard to fisheries management. Many fishing community members believe that nothing they do, including testifying at PFMC meetings, will influence management decisions. Many fishing community members we interviewed expressed the belief that management decisions are made prior to PFMC meetings.

Perhaps the most commonly expressed sentiment, and the one that most erodes trust, is that managers and scientists really aren't interested in listening to the fishing community. This theme arose in almost every interview we conducted with fishing community members.

We told them a long time ago that canary rockfish were not there, and they didn't listen to us. Now it's a big problem. Canary rockfish could halt the whole fishery. [LE, north coast trawler]

Although quantifying the management community's "willingness to listen" might be useful, it was beyond the scope of this research. All of the management staff and scientists interviewed for this project expressed an interest in listening to, and learning from, industry members. However, many also passed along anecdotes about managers and scientists who were not interested in hearing industry members' views.

Whether members of fisheries management are willing to listen to the industry depends on both individual and organizational values. On an agency level, the amount of effort put into listening depends on agency priorities as well as funding.

PFMC staff also say they listen to fishing community input—indeed, the entire point of the PFMC process is to involve local representatives in management. Before any decision, the PFMC hears technical advice from working committees, including an industry advisory committee with representation from sport, commercial, and environmental interests. At PFMC meetings, an "open mic" session allows any interested party to state his or her opinion. However, PFMC decisions are based on a complex and often conflicting body of data. As a PFMC staff member says:

> *"The Council regularly pays attention to who takes the time and energy and internal fortitude to stand up in front of them. But there are a lot of conflicting views and desires, and it comes down to a balancing act…In some cases, there aren't very many real choices, but the whole idea of this is to get the input from the people who are affected." [PL, PFMC]*

On an individual level, willingness to communicate and listen depends on personality, interest, and ability. Many scientists and fishing community members do enjoy communicating with one another. As a result, they may become involved in the PFMC process, in collaborative research projects, or in other arenas where industry-agency communication occurs. These people become well known and trusted:

> *"The scientists who are more closely associated with hands-on data gathering, the guys that work the boats, the guys that lead the scientific parties, those guys are generally widely respected….The people who do the actual assessment and rub shoulders with the fishermen are looked upon as knowledgeable and competent individuals." [WT, midcoast trawler]*

However, while many fishing community members want scientists and managers to "go down on the docks" to talk informally with fishermen, the fact is that many scientists and managers are not comfortable doing so. Some agency staff are intimidated by the idea of approaching fishermen on the docks. In addition, different communication styles contribute to the divide:

> *"Certainly I don't feel comfortable walking down the dock and jumping on some guy's boat. Certainly I have impressions of the fishermen too. We speak different languages, and usually our stock assessment reports and things like that, they're written for us, not the fishermen. We talk our own language." [VI, midcoast scientist]*

Others suggested that people who are trained in hard sciences such as biology may lack the skills and interest to listen to fishing community members. Similarly, many fishing community members are intimidated by the thought of testifying before the PFMC. In addition to a basic desire not to appear ignorant or foolish, these perceptions arise from cultural differences and stereotyping.

Stereotyping and cultural differences

Stereotypes play an important role in communications—often a negative one. There are well-articulated stereotypes about fishermen, managers, and scientists. However, it must be noted that while stereotypes exist, not everybody in a particular community

believes in them, and those who do believe in them vary in the intensity of their beliefs. In describing the stereotypes below, we do not mean to imply that all fishermen feel this way about managers and scientists, nor that all managers and scientists feel this way about fishermen. These stereotypes are symbols—albeit important ones—that influence people's perceptions. (Note: In articulating these stereotypes we do not wish to offend members of either community. Although the stereotypes are negative and derogatory, they do exist, and are best confronted openly.)

Stereotypes are often based on perceptions of cultural differences: for example, many scientists and managers *do* sit in front of computers in offices, and many fishermen *are* independent and individualistic. However, when people accept stereotypes at face value, they make assumptions that are often both false and negative. People are more apt to accept stereotypes at face value when they have little direct experience with other groups. Positive interaction, such as that which can occur in collaborative research projects, breaks down stereotypes.

Stereotypes of scientists and managers reflect both anger and lack of respect. They characterize scientists and managers as being out of touch with reality, narrowly focused on esoteric data, wimpy, condescending, superior, and greedy. The term "ivory tower" is often applied to this community. The following statements are typical:

> *"Try going out into the field with the local boats instead of sitting in front of your computers in your ivory towers worrying about your 401K and what percentage you will retire at with your full health benefits, all of which none of us have" [Comment on draft groundfish strategic plan]*

> *"In general…[fishermen] know that scientists are puny little people who get sick on boats and who profess superior knowledge to anybody when all they can do is play with a computer. I.e., they don't know fish." [WT, midcoast trawler]*

Examples of stereotypes about fishermen are harder to come by, in part because managers and scientists feel less anger toward the fishing community, are not called upon to comment on their actions, and may be less likely to express such beliefs to a researcher. However, fishermen themselves often perpetuate stereotypes about their industry:

> *Fishermen are more like cats than dogs. They're not great communicators. They're independent, present-minded; and they're optimists to the bitter end. They're not joiners or belongers. It's like the title of that Sea Grant video—"Business in Our Blood." "Fishing isn't what I do; it's what I am." [WC, north coast former fisherman]*

> *Fishermen are a group of independent people. The very act of fishing makes them independent and self sufficient, so they don't cooperate very well and they don't work very well together. Everybody pulls at everybody else because they don't want to be beholden to anybody. If you go to sea every day and you're responsible for everything, you don't like people telling you what to do.…You cannot get rid of fishermen. You cannot retrain them for computers and stuff. People who like the outdoors simply do not do*

well in a confined area. And fishing is addictive. [LW, south coast troller]

A darker stereotype of fishermen exists. It refers to drunken and violent behavior, lack of education, disregard of the environment, and greed. Although none of the managers or scientists we interviewed expressed a belief in this stereotype, a few noted that it does exist.

The media, which is the public's source of most information regarding the fishing industry, perpetuates stereotypes. Because the fishing community is so fragmented, no clear message about the industry is sent to the public. For example, the book and subsequent movie *The Perfect Storm* received accolades from the fishing industry for reflecting an important event in the history of a fishing community, while simultaneously being criticized by the industry for perpetuating negative stereotypes about fishermen.

The data question

People are hanging their hat on having the right data. But that won't create more fish. It may give us the right answers, but it will probably bring a different set of problems....The right answer might be less fish. [ZW, south coast trawler]

Fisheries management relies on accurate, factual data. The communication of data, their appropriate interpretation and use, and people's attitudes toward data and analyses used in management emerged as themes in the interviews for this project.

Members of the fishing and fisheries management communities all expressed doubts about the quality and quantity of data, as well as its interpretation and use. Although both groups agreed that the current data were inadequate, their other concerns were quite different. Some fishing community members simply felt that scientists' and managers' conclusions were wrong. They were angry that managers didn't take the time to observe fishing practices:

[At a meeting about marine protected areas] this guy got up and talked about reserves....He said they wouldn't allow hook and line fishing in the reserves because they can catch the very last fish. I would like to take him fishing for the very last fish, as long as he's willing to pay for all the equipment I lose....You don't play around those reefs. It's very expensive to replace the lost gear....Catch the last rockfish!....There's no way a troller can get the last rockfish. [LW, south coast troller]

If fishermen really thought there were no fish in the ocean, we would go home and retrain for other jobs. But we do see fish out there. [LE, north coast trawler]

Both fishermen and scientists agreed that there was not enough data available for making effective decisions and that it takes a too long for data to be gathered, analyzed, and presented. Data collection, analysis, and review processes are very slow, in part because scientists want to make sure that their data is accurate before management uses it to make decisions. This comment from a processor is typical:

"[The data] isn't timely enough—it's two, three years old, because you go out and do a resource survey, and it takes three years to get the results.

Well, by then it's time to make a new survey....So the information we use to make decisions on is very poor, and because of that...we make decisions that affect the economy, the health of the resource and the environment that are very, very poor. Sometimes we're right, but more often than not we're playing catch-up...and that's just in information flow. It gets caught in bureaucracy at some point, and instead of taking a straight line it starts going around in circles and sometimes it never comes out." [GU, north coast processor]

Scientists were most likely to blame the lack of data on funding, though standardization of data collection and reporting methods are also a challenge. (In its FY 2002 budget, NMFS has requested an additional $2.7 million for expanding stock assessments [NOAA 2001].) Industry members recognized that lack of funding hampers data collection, but they also feel that management would benefit from using information contributed by fishermen. As one midcoast fishing family member said,

"Guys have been saying for years, you know, '[use] the logbook information. Talk to us if you want to know what's going on out there. We have a lot of information that would help with this research.' And they're right....The tuna fleet knew that the second major El Niño was coming, based on conditions in the South Pacific months before anything ever hit the media about El Niño, because of what they saw in the South Pacific. They said 'another big one's coming.' They could see it. And they were exactly right."

When management does ask for input from the fishing community, the result can be very positive:

"The places that I have seen [communication] work the best have been...because of the need for some cooperative, creative solutions to some allocation issues among the fishermen or fisheries—when management...has gone out and made the effort to draw in fisheries people and have made it clear that they needed their information. It wasn't like 'we are telling you things'; they actually made it clear that, 'listen, we need some help here.' That's when it's working better. [PT, midcoast troller]

Many fishing community members believe that scientists don't value information provided by fishermen—because they don't trust fishermen to tell the truth in their logbooks, because logbook information is too anecdotal, or because logbook data is different from what is needed by managers. Fishermen have in-depth, detailed knowledge about the parts of the ocean in which they work. Their observations are based on personal experience, as well as information shared by other fishermen. Scientists have a wider, shallower view of fish stocks and ocean conditions based on formalized scientific observation of surveys and fishery landings. Many fishermen feel that scientific findings do not match their own observations at sea; therefore they believe the data are faulty.

Fishermen are particularly angry when management seemingly ignores their observations. Many fishermen see their participation as an effective, efficient way to improve data collection.

"Industry will always feel that the data is incredible if the data is gathered outside of our sight on dedicated research vessels. The science, to be credible, must be conducted openly and with the industry's assistance." [Comment on draft groundfish strategic plan]

Many scientists and managers agreed that using fishermen's data would be helpful, if only to improve relations and increase trust between the communities. Scientists do use logbook and fish ticket data when the data comply with their research protocols and address the questions they are answering. However, data from different boats, collected in different ways, often cannot be compared because of standardization issues. In addition, data from logbooks must be manually entered into a database—a slow and error-prone process. While fishermen often see scientists' reservations about logbook information as a sign of distrust, it is more an issue of research methodology. Electronic logbooks are being explored as a way to ensure accurate and fast reporting, but a practical and relevant electronic logbook that is widely used by the industry has yet to be created.

Anecdotal information poses a similar challenge. While fishermen say their anecdotal information is useful and should be incorporated into management decisions, common data analysis methods are not suitable for recording such information.

"How do we process an observation that some guy made this huge tow somewhere, or saw a weird bunch of fish out there? Whatever it is, we don't have the mechanism to deal with that. And I'm not sure how you would deal with it anyway, but it seems like there's an opportunity there that we haven't tapped." [VI, midcoast scientist]

One challenge in communicating science is that there are varying perceptions of what science offers. Some believe that science promises a single, reliable answer to the questions raised in fisheries management. For them, the right amount of the right data, collected in the right way, will solve the problem. People who perceive science in this way get angry with scientists when their analyses don't provide the right answers. Others see science as a gradual process of working toward "the truth." However, the truth is made up of many pieces and is ever changing. Scientists must not only try to describe what currently exists; they must estimate how it will change in the future. In practice, decisions must be based on a perpetually incomplete process of using the best information available. It is important for members of both the fishing and fisheries management communities to continually recognize that science is a process and to acknowledge that it does not provide discrete, solid solutions. As one manager said about a town hall meeting, "It was important to recognize the failings of our own system in order to gain respect."

"Is there one person among you who is not afraid to admit that you really don't know what is going on with the fish stocks?" [Comment on draft groundfish strategic plan]

A few years ago we were at a 7,000 ton quota on sablefish. The scientists came in and recommended 2,500 tons, and [fishermen protested]; they redid the stock assessment and came in with 9,300 tons.

Sablefish live to be 30 years old and don't change that fast. Differences in the data created differences in the model's result. Each time, it was "we've learned more and we're right this time." This year they'll come in with more data and say "we're right this time." It's not a big deal to them or the managers, but we would have put everyone out of business with 2,500 tons. To the fishermen, that seems pretty flip. Yet they're taking their jobs very seriously and trying to do the right thing. [ZW, south coast trawler]

Some scientists are making a concerted effort to communicate their research methods and findings to the fishing community and to gather input from fishing community members. Some fishing community members have observed that scientists are trying to make themselves more accessible. In February 2001, approximately 40 scientists attended an informal poster session sponsored by Oregon Extension Sea Grant, designed to increase communication between the scientific and fishing communities. Workshops and more unusual events like the poster session are some of the most popular ways for scientists to communicate with the fishing community and will be examined in their own section below. Scientists are also using the Internet to explain the stock assessment process.[4] Perhaps the most promising method of increasing communication between the fishing community and scientists is collaborative research projects.

Collaborative research

Collaborative research—in which fishing community members participate in choosing research questions, planning, conducting, and reporting research—is the focus of much attention. NMFS's funding for collaborative research in the Pacific Northwest is increasing, in part because of the severity of the groundfish crisis. Collaborative research is used in the Northeast, where there is greater federal funding available as a result of fishery crises.[5]

Collaboration has been defined as the "pooling of appreciations and resources by two or more stakeholders to solve a set of problems which neither can solve individually" (Howell 1982). Collaboration and collaborative learning encourage stakeholders to think differently in order to improve the situation rather than solving a specific problem. Results are measured in terms of progress rather than in problem solving, and the process allows all participants to feel that they have participated and contributed (Daniels and Walker 2001; Collier 1995).

Collaborative research can increase communication between scientists and fishermen, provide new insights and perspectives on problems, help scientists identify research questions and methods, increase fishermen's understanding of the stock assessment process and scientists' understanding of the fishing community, provide additional income to fishermen, and give fishermen a sense of ownership in management. It can also be more cost-effective, in the long term, than traditional methods. Harms and Sylvia's (1999) study of collaborative research in the West Coast groundfish fishery provides detailed insights into how collaborative research works and doesn't work.

Some projects are more collaborative than others. True collaboration means participation of all parties throughout the research process, from

[4]For example, see Dave Sampson's on-line fishery simulator, www.hmsc.orst.edu/projects/findfmsy/.

[5]For a glimpse into collaborative research in the Northeast, see the Web site www.fishresearch.org, which links scientists with fishermen who are interested in participating in collaborative research projects.

choosing the research topic to planning to reporting. Harms and Sylvia (1999:14) note that "Industry may not comply with plans that are perceived as unjust or whose objectives they do not share." They also point out that true collaboration means that scientists must relinquish some control over the process.

Involving fishing community members in collaborative research design means educating them about the process of conducting research, which, although time-consuming, can be valuable in itself. Projects that involve chartering boats for research may not be truly collaborative if fishermen do not actively participate in the research design process; however, they still contribute to increased communication between scientists and fishermen. Many fishermen are enthusiastic about these programs:

> *I did surveys for two years. It was a token effort, but it's great. We need more of that. [LE, north coast trawler]*

> *"Now [a local fisherman] went and got that project there up the river, that survey. He just got done with it, catching small sturgeon....They were doing a project there. And he done that for at least three or four weeks. A nice little boost to the income. Last year, [another fisherman] and two or three other guys got these offshore research projects to look at fish, and that helped relieve them a little." [LD, north coast supplier]*

Collaboration also occurs when members of different stakeholder groups participate in working groups or advisory panels. Although multi-stakeholder groups can break down into a series of unproductive arguments and posturing, they can also provide a valuable opportunity to move beyond differences and assumptions. Daniels and Walker's work with collaborative learning in natural resources management provides a useful, tested framework for creating positive outcomes in multi-stakeholder groups (2001). The collaborative learning process is well suited to dealing with allocation problems, because it provides an opportunity to deepen participants' understanding of the issues and of common interests and values.

An approach similar to collaborative learning took place during the salmon crisis, when the Oregon Fish and Wildlife Commission brought together a group of recreational and commercial fishermen to discuss salmon allocation and related issues. The group met for several years, generating productive agreements and a more trusting relationship with management. In addition, managers valued the group's opinions because they represented a broad spectrum of participants.

Incorporating social data

Historically, fisheries management concentrated on questions of fish biology and population dynamics. More recently, it has focused on ecosystem and habitat considerations. The amended Magnuson-Stevens Conservation and Management Act now requires fisheries management to take community effects into account when making decisions. To do so, management needs social, economic, and cultural data, and staff who know how to collect and apply such information. Currently, very few—if any—social researchers, apart from economists, work for fisheries management agencies.

Federal agencies are also hampered in their efforts to collect social research by the Paperwork Reduction Act (PRA). The PRA requires that the Federal Office on Information and Regulatory Affairs review all federal activities that involve collecting information from 10 or more people—including questionnaires, surveys, and reporting or recordkeeping requirements. Agencies are given an "information collection budget"—a set number of hours the public may spend filling out paperwork from a particular agency. Agencies may be required to discontinue or change their information collection activities if they have reached their budget limit (OMBWatch 2001). In effect, this makes it significantly more difficult for federal agencies to conduct their own surveys. State agencies are not affected by the PRA, and ODFW does survey its constituents frequently.

To many fishermen, paperwork reduction sounds like a fine idea. When Gilden and Smith (1996a and 1996b) sent out surveys to trollers and gillnetters, many complained that they were being "surveyed to death":

> *I have been a Columbia River gillnetter for 34 years. I am truly appalled at the government's answer to the plight of the fisherman. Another survey, another survey, and yet, another survey! Well, I guess we know where the money is going.*

In addition, many fishermen are reluctant to share information about their personal lives. Many fear that information they provide to management will be used against them. However, fishing community members appear more likely to share information when they believe it will improve the outlook for the industry. The authors of this report will explore this question in further depth in a research project to be conducted during the summer of 2001.

Representation

People who hold workshops and meetings that target the commercial fishing industry often see familiar faces around the table. These are the faces of a core group of fishing community members who are active and involved in fisheries management. Because many fishermen can't or won't attend meetings and workshops, these active community members are important links to the rest of the fishing population who depend on them to pass along important information. Developing a good relationship with these "movers and shakers" is an important step in communicating information to the fishing community. Some officially represent gear groups, and some unofficially represent sectors of the fishing industry or the fishing community as a whole.

> *Typically, we hear from the same people who represent the same groups. It's too expensive for an individual to come and spend 2–3 to 5 days in hotels with meals and everything else. So there are a few group representatives who have the most influence. [PL, PFMC]*

The people interviewed for this project were not in agreement about whether these key individuals accurately represented the fishing industry. While most felt that they did, others had concerns that they felt were not represented. Even if these key individuals represent their constituencies accurately, management decisions are not guaranteed to reflect their views and concerns. As a result, people who

do not involve themselves in management may end up feeling neglected by the process.

The makeup of the PFMC and its subpanels and committees is a highly charged subject. Many people felt that the PFMC did not represent their interests—either the interests of the fishing community as a whole or of their particular sector. For example, some people with small vessels feel underrepresented on the PFMC, while others feel that salmon interests on the PFMC outnumber groundfish interests.

PFMC members are expected to represent their constituencies and to interact with them outside of PFMC meetings. When the number of representatives for a certain constituency is small, members have decreased access to their representatives and may feel underrepresented. The better organized a constituency is—and the fewer internal conflicts it has—the more effective it will be at communicating with its formal or informal representatives, with other sectors of the fishing industry, and with management.

OVERVIEW OF COMMUNICATION METHODS

In surveys of gillnetters and trollers conducted in 1996, "word of mouth" was the method most often cited for receiving information about disaster relief programs (Gilden and Smith 1996a and 1996b). Fifty-five percent of gillnetters and 71 percent of trollers found out about the programs through word of mouth. Newsletters, newspapers, and trade associations were the next most commonly used information sources.

At the time these surveys were conducted, the Internet was used considerably less than it is now. Although more and more agencies are putting information on the Web, we suspect that the results of a survey conducted with the fishing industry today would be similar to the 1996 results. While the number of fishing community members accessing the Internet is increasing, the vast majority still get their information through word of mouth, newsletters, and newspapers.

Face-to-face communication

Informal: word of mouth

Despite the abundance of newsletters, e-mails, and meetings, in the fishing community most information is exchanged informally by word of mouth. Fishermen talk on the docks, in coffeehouses, in gear stores, at restaurants, and everywhere else. Informal communication is also important for agency staff and scientists, because it allows them to compare experiences, share opinions, and develop new ideas in a stress-free setting. It is important for both fishing community members and agency staff to have comfortable places where informal communication can take place. It is even more helpful if fishing community members and agency staff frequent the same informal locations. This happens during PFMC meetings, when people meet in the halls and in hotel lounges and restaurants. Unfortunately, it rarely occurs elsewhere.

Most coastal communities have local hangouts where fishermen and other fishing community members meet. In Charleston, the Basin Café and Sea Basket restaurant are popular spots for fishermen, though different circles of fishermen frequent each business. In Newport, fishermen used to frequent the Piptide restaurant and the Cuppatunes coffeeshop, which were both within easy walking distance of the docks. The Piptide has changed hands and is not as popular with fishermen as it used to be. Cuppatunes—which will be discussed in more detail below—has gone out of business. Other venues have also disappeared:

> *"In Astoria there used to be some neat old spots. The old Scandinavian fisherman used to have steam baths. All the fish companies had them. There was one downtown, fairly big—just a gas—and they sold beer. God, you come in all bedraggled and destroyed tired, and all wore out. And you get a bath....It was really fun. Very Scandinavian.*

We went in there every time we came in. Get our fish sold, clean the boat, get everything done and race right up there." [PT, midcoast troller]

Fishermen frequently say they want managers and scientists to "come down on the docks." Visiting the docks (or other places frequented by fishermen) demonstrates that managers and scientists are willing to go out of their way to listen to what fishing community members have to say. It also demonstrates their willingness to appear outside of the insulating formality of a meeting or workshop. Agency staff report that in the past, they had more opportunities to go on the docks:

"We used to take a trip down the coast about every year....Because the division's emphasis has changed, we don't get any brownie points for going down the coast....Over the years, we would go into plants and say hello to folks, y'know, and after you'd done this, people would...put a name with the face...and say, "Oh, you're the NMFS guys."...Now I feel like I don't even know the industry anymore because...you're just doing what's put in front of you....I feel badly a lot of times that we've dropped [those efforts.]" [FT, Seattle NMFS staff]

Informal communication has its drawbacks. As noted previously, cultural differences and stereotypes of management and fishing community members can lead to misunderstandings. Fishing community members can be very outspoken and direct in their communications. Developing rapport and trust takes time, effort, and a willingness to be vulnerable. Recognizing the complexity and obscurity of most communications, Mayer (1990) recommends that people "consider miscommunication as routine and part of the process. Expect communication to be challenging and patiently work at it."

"When I was very young, I was kind of devastated by the brusqueness, the over-the-top stuff that you got from a lot of these guys [fishermen and processors], and I was just absolutely terrified...but looking back, I've now realized that...if you give it time, you learn to respect the other person, you understand where they come from, and you don't just have that kind of knee-jerk reaction." [FT, Seattle NMFS staff]

Another risk with word-of-mouth communication is that information may spread in one sector of the fishing community (for example, one gear type or locality) and not another. In addition, individual personalities, communication styles, and reputation affect how information is valued by others. People who passes along misinformation in an authoritative way may be believed until someone else corrects them. Several people interviewed for this project noted that communication among fishermen is like a game of "operator," where a message is passed through so many people that by the end its meaning has completely changed. Misinformation and rumors are passed along just as easily as facts, and people do not always take the time to track down the truth. The fact that so much information gets passed along through word of mouth requires that agency staff, Extension agents, knowledgeable fishing community members, and gear suppliers practice rumor control.

The industry runs on gossip....I've found a lot of talk going around the dock. Nobody checks it. I just check and see if it's right or true. Half the time it's not. That's not because the information isn't there; it's how they communicate and move information around. [U], south coast longliner]

"You've got guys that have been shot at with regulations and cut off from this and that; and they don't understand...they'll never understand. They've got a chip on their shoulder already. And so they might hear something, but they might not hear it right. They come in, and they're madder than hell....So we need to have our ducks in a row so we can calm them down and say 'no, this is the way it is.'" [VT, midcoast supplier]

Despite these drawbacks, informal personal communication remains one of the best ways to increase trust and understanding among different groups. Knowing this, agencies and individuals have suggested various ways to promote informal communication. During the past few years, people in the fishing and management communities have suggesting holding informal dinners, breakfasts, open houses at agencies, and regular meetings at coffee shops. They have also suggested and tried slightly more formal events such as poster sessions, workshops, and symposia.

The Cuppatunes project was one attempt at bringing fishermen and scientists together in a place already frequented by fishing community members. Cuppatunes was a coffee house and music store across from the docks on Newport's waterfront. On a recommendation by Barry Fisher, a respected Newport trawler, and two leaders of a local fishermen's wives group, the Northwest Fisheries Science Center hired Bob Schoning, a former director of NMFS, to meet with fishermen on a regular basis at Cuppatunes. For about 18 Thursday mornings between 1996 and 1999, Schoning went to Cuppatunes to visit with fishermen, answer their questions, and listen to their concerns. When possible, he tracked down information they needed and tried to resolve their problems. He also gave summaries of the meetings to NMFS and other agencies.

Fishermen responded positively to the Cuppatunes project.

"We had a lot of regular attendees that would come there, and I think that for the majority of the fellas it was worthwhile....We had some very candid discussions, and if it didn't do anything else, it indicated...to the fishermen that somebody in government cared about them, wanted to know what their thoughts were, and wanted to try and do something to solve the problems, or at least get them information to help them solve them." [Bob Schoning]

"[Schoning] would find some article, some report, and come back with it, and I know that made a huge impression on some of the fishermen. Just the fact that they had a government person to talk to, was like a first." [VI, midcoast scientist]

Schoning found that it was harder to attract scientists to Cuppatunes. Though a few scientists attended regularly, there was not as much interaction between scientists and fishermen as he had hoped. This may be partly because research scientists were unable to answer the specific

questions fishermen had about regulatory matters:

> *"I think one of the big failings in terms of Cuppatunes…I think most of the questions would be on regulations and how it would affect them directly. We still have a hard time meeting that need….Unless they get that satisfied, maybe then they have an interest in knowing more about the information base and how they might be able to understand that, and how decisions are made…" [JI, NMFS]*

The Cuppatunes project ended when the business was sold. Schoning worked with Newport Extension agents and an OSU scientist to continue the sessions at the Newport Port Commission office, but although these meetings were widely publicized, no fishermen showed up. The location simply was not as popular or convenient. Though Extension agents and scientists considered other possibilities, such as renting an alternative site for the meetings, none of these ideas came to fruition.

Another attempt at bringing scientists and fishermen together in an informal setting occurred in February 2001 when Jennifer Gilden and Extension Sea Grant agent Hal Weeks organized an informal poster session for the fishing industry, held at Englund Marine Supply in Newport. To attract industry members, the organizers provided a drawing for float jackets, gloves, and hats was held at the event, and refreshments were provided. The poster session and drawing were publicized through posted and mailed flyers, in press releases sent to local newspapers and radio stations, on the Heads Up! Web site, and at a meeting on finfish excluders the day before the session. In all, researchers presented 24 posters on a wide range of topics relating to the commercial fishing industry, oceanography, and stock assessments.

Approximately 40 scientists and 12 to 15 fishing community members attended the poster session. The relatively low number of attendees from the fishing community was a disappointment, but was not surprising. A brief spell of good weather and flat seas sent many people out fishing, and fishermen reported that many vessels were in Alaska at the time. In addition, some fishermen might have been turned off by the crowd and the large number of scientists at the event. Others might not have been aware of or interested in attending the session.

In phone and e-mail conversations afterward, attendees were asked to evaluate the event. Scientists spoke positively of the session, though many wished that more industry members had attended. Fishermen rated the venue highly, with one noting that it was preferable to the Hatfield Marine Science Center (HMSC). Although the organizers asked researchers to design their posters for a general audience, many of the posters were very technical, and a few fishermen said they weren't able to understand them. However, they reported having conversations with the researchers that helped clarify the posters. Several presenters provided videos, which the fishermen found interesting and helpful. Some fishermen felt that the poster session was too trawl oriented. Although only 25 percent of the posters were related to trawling, there were no posters related to crabbing, which was a top concern for Newport fishermen at the time.

The poster session was an experiment in informal communication and highlighted many of the difficulties in

bringing fishermen and scientists together. Although the turnout by fishermen was low, the fact that the event took place demonstrated a willingness by scientists to talk with fishermen, which in itself is valuable. Similar events in the future might focus on a narrower range of research with a smaller number of scientists in a more informal setting.

The poster session was beneficial in another way, in that scientists felt it gave them a valuable opportunity to talk informally with other scientists. Informal communication among scientists is an important way of generating research ideas and methodologies and sharing findings. One scientist at HMSC noted the absence of a common meeting area at HMSC:

> *"The number of times I've actually talked with other researchers quite frankly was limited by the fact that there is no coffee shop, no student union to go hang out [at HMSC]. Some of the good ideas come from just bullshitting in the hallway. It doesn't happen much....I've always thought that we would benefit greatly by having some coffee shop, some central gathering place." [VI, midcoast scientist]*

Venues for informal interaction are important. However, they are not always valued by administrators and funding agencies, because they are not part of the formal structure of work, just as "going down on the docks" is not considered "work." Informal communication is considered "nice to do," but not necessary. Our findings, and those of others such as Mayer (1990), suggest that in gaining trust and building links between the fishing and management communities, fostering informal communication is a "need to do."

> *"Over the years we've used a lot of different techniques, and one of the things that I've found to be most effective, although time consuming, and that's just one-on-one or one-on-three over a cup of coffee like we're sitting here right now." [LM, Extension agent]*

Semiformal: Extension agents, port biologists, and other liaisons

Liaisons and outreach specialists play an important role in communications between the fishing and management communities. Being perceived as trustworthy, neutral, and nonregulatory is vitally important for liaisons.

Although fishing community members want to see agency staff "on the docks," they cannot fill the same role as a neutral liaison. The most visible and effective role of this type is played by Oregon Extension Sea Grant agents. In a survey conducted in 1998, the fishing community was asked, "What are your most trusted sources of information about fishing-related issues (such as industry, family, seafood, and safety)?" Oregon Extension Sea Grant came in second, after industry sources, in every category except for safety, where government sources (presumably the Coast Guard) came first (Conway 1998). Extension Sea Grant agents are well known and respected by people in both the fishing and management communities. Because they are a reliable and neutral source of information, they are also well trusted:

> *"I'll tell you one place where fishermen do turn to for advice—and that's Sea Grant Extension agents. They're probably the best group on the coast in terms of being able to communicate things to*

Working with liaisons

- Provide information to gear stores, coffee shops, and other businesses that cater to the fishing community. Include these businesses on mailing lists for newsletters and press releases.
- Explore enhancing the role of port biologists in communications. Include them in discussions about communications. Listen to what they have to say.
- Communicate with your local Extension Sea Grant agent.
- Learn about Sea Grant's "outreach peer" model.

> *fishermen. They know where to put out the word and what they should say and what kind of things and so forth. They're very good at it." [WT, midcoast trawler]*

Extension Sea Grant agents are a valuable source of information on how to communicate with the commercial fishing community. However, they should not be considered an alternative to direct communication by the fisheries management community.

Extension Sea Grant has used "fishing family peers" and is currently using "groundfish outreach peers" to disseminate information. Because these peers come from the fishing community, they have valuable knowledge, skills, and social networks that help them to communicate effectively. Other organizations would benefit from considering the peer outreach model to extend information.

Other people and organizations can also play the role of liaison. Gear stores are common meeting areas for fishermen and have an important role in disseminating and collecting information, as well as stopping rumors. Gear stores must also appear neutral, especially if they cater to multiple gear types. Suppliers often find themselves answering questions about regulations and events in the commercial fishing arena.

> *"They want to know what's going on…immediately. Have you heard what happened with the [Stevens] thing? You name it! The charter guy comes in here. He's going out for halibut season this year. [He wants to know everything], from stem to stern, including Coast Guard regulations. You know, what do I need for my life raft?….Any new regulation in the industry of any kind, we will get asked about it." [VT, midcoast supplier]*

Because they play this unofficial role, gear stores and suppliers need a broad range of information about regulations and events. They can serve as effective distribution sites for information about safety, management, and Coast Guard regulations. The Coast Guard has found that interacting with gear store employees helps them learn about the concerns of the fishing community:

> *"We put stacks of information at England's. They have lots of questions for us that they relay from fishermen; they also provide us a lot of information about what's going on in the fishery, what people buy, what concerns they have. I generally stop and chat with them. They probably think the information goes one way, but we get a lot of useful information." [FU, Coast Guard]*

ODFW port biologists also play an unofficial role as liaison. ODFW has four permanent port biologists who focus on groundfish: two in Newport, one in Astoria, and one in Charleston. Most have worked in their positions for over 10 years (Sampson and Crone

1997). Port samplers focusing on other species work during the summer months in the same communities and in several smaller coastal communities. Port biologists are responsible for collecting fish tickets, samples, and logbooks and for disseminating information.

By working with fishermen on a daily basis, port biologists can become well known and respected. Since they do not enforce regulations, they are seen as neutral. However, to answer the questions posed to them, they must also have access to a wide range of information. They must also have the time to spend talking to people on the docks. Perhaps most importantly, management must listen to their reports. As a well-respected, existing network of liaisons, port biologists represent an underused resource for communication.

Liaisons do not have to be part of a larger organization. Well-trusted members of the fishing community can serve as gateways to the rest of the community. Having their seal of approval lends credence to those who take the time to develop relationships with these respected community members.

> *"If I went and sought out the two or three key people that deal with the fishermen on a one-on-one basis all the time, I'd win their confidence and go through them. That's how I'd communicate to the group, absolutely. It's much easier for you as a stranger to come in and sit down in a net shop and get to know me, and have me say 'hey, Bob here's really got some great ideas'—an endorsement. That's how I'd do it." [LD, north coast supplier]*

Several organizations, including NMFS, are exploring the idea of hiring liaisons. Agencies can help these efforts succeed by learning from and coordinating their efforts with Extension agents and others who serve as liaisons.

Formal: meetings and workshops

Meetings and workshops are a common way to disseminate information, gather feedback, and involve the commercial fishing community in planning. Below, we will explore two common types of meetings: town hall meetings and workshops, and PFMC meetings.

Town hall meetings and workshops are held by a number of agencies and organizations. For example, ODFW holds regular meetings with fishing community members in Newport prior to PFMC meetings; NMFS holds a public pre-assessment workshop every year; the Oregon State Police hold meetings with fishing community members to discuss enforcement issues; the Coast Guard holds meetings to discuss safety issues; the PFMC holds meetings to generate input on management plans; and Extension Sea Grant holds educational workshops. Other groups, such as the interagency Oregon Ocean Policy Advisory Council and the PMCC, also conduct town hall-style meetings.

No matter what agency or organization is sponsoring them, meetings face the common challenge of attracting attendees. Even meetings that are widely publicized through flyers, newspaper notices, radio spots, and the Internet can suffer from poor attendance:

> *"We have had...various meetings in Newport, but people generally don't come. It's a chronic problem. So if it happens to be a nice day, if it's been*

Holding effective meetings

- Fulfill the promise of the meeting. For example, if the meeting is billed as an opportunity to hear feedback, spend a large part of the meeting listening to—and responding to—participants' comments.
- Even if the meeting is not billed as an opportunity for feedback, set aside time for participants' comments and questions.
- When possible, hold meetings in places that are convenient and comfortable for fishing community members. Rotate meeting locations between urban and coastal areas.
- Call key fishing community members immediately before meetings to remind them to attend.
- Try different meeting arrangements to improve communication and alter power dynamics. For example, sit in a circle or hire a neutral facilitator.
- At more formal meetings, provide venues for informal communication between people from the management and fishing communities.
- Set up a regular series of informal gatherings, such as breakfasts or lunches, where community members can talk freely and build relationships.
- Give people an opportunity to express their opinions and vent their frustrations before getting down to business.
- Be as flexible as possible in scheduling meetings. Schedule meetings at times that are most convenient to fishing community members—for example, in the early morning. Schedule multiple meetings if possible.
- Don't expect everyone to attend one particular meeting. Focus on getting key community members to attend.
- When scheduling meetings, avoid busy fishing seasons. Avoid hunting season when possible; many fishermen go hunting in the fall. When possible, schedule meetings during bad weather.
- Learn about new and different ways to run meetings.

stormy for three weeks and all of a sudden it's sunny and the sea flattens out, they're not going to have anybody show up." [PL, PFMC]

Meeting attendance is usually low for one of the following reasons: lack of publicity, good weather for fishing, fishing season schedules, and lack of interest by the fishing community. As noted earlier in this report, fishermen are much more likely to attend meetings or become involved in management if the topic under discussion affects their bottom line. They are also more likely to attend meetings if decisions makers are present and if their input is likely to influence decision making. If given a choice between fishing and attending a meeting that is not absolutely crucial, they will choose fishing.

"If a subject is very controversial, more people will show up for a meeting. On the south coast a while back there was an issue concerning EPIRBs [Emergency Position Indicating Radio Beacons]. People died. We got a lot of people at those meetings; it was an emotional subject. Usually, there are no more than six people. But it doesn't bother me any more because I know it filters out." [FU, US Coast Guard]

If fishing community members do choose to attend a meeting, they expect that it stay on the topic and address issues of concern to them. If the meeting is billed as an opportunity for feedback, they expect to be given the chance to comment and to be listened to with respect. When these expectations are not met, anger and distrust can develop.

"After attending the Long Beach public review session, it was

disturbing how most of the questions asked were answered vaguely, and at times even sidestepped. There was very little meaningful dialog and the majority of questions were answered with 'the Council will ultimately make that decision and will consider your input (received in person or writing) at the next Council meeting.' It was my expectation the public review session was designed to get the fishermen's input." [Comment on draft groundfish strategic plan]

With meetings, as with other forms of communication, frequency and attendance increase during periods of change and crisis, and decrease as problems lose their intensity. Similarly, meeting attendance and success vary by geographic location and the cohesion of the fishing community. In areas where the fishing community is well organized and where there are industry support organizations and individuals who are skilled in outreach and publicity, people are more likely to hear about, attend, and participate in meetings. For a number of reasons, including politics and representation, some local communities are also more welcoming to managers than others.

Often, meetings are attended by a core group of involved fishing community members—often the same people who attend PFMC meetings and become involved in research projects. While meeting organizers sometimes despair when they see few new faces, it is important to remember that information in the fishing community spreads through word of mouth. If the attendees are respected and well-connected, they will help spread information to those who need to hear it:

"Generally for the meetings, attendance is low. It's the same half-dozen people each time. That used to bother me, but now I realize they are good about letting everybody else know what went on at the meeting. I've made an effort to know who the key six people in a port are, so I know they are the right people to give information to so they can spread it around." [FU, US Coast Guard]

Attendance at town hall meetings is also affected by venue. Some places, like the Seafood Lab in Astoria or the meeting room above Englund Marine Supply in Newport, are more convenient and comfortable for fishing community members than others. Several people interviewed for this project noted that fishermen prefer not to go to the Hatfield Marine Science Center. Part of the reason may be that it is considered the territory of scientists and managers. As one scientist noted, "The number of times I've had fishermen come in this office, I can count on one hand in 10 years." In addition, the maze of similar buildings and offices at HMSC makes it a confusing place to navigate.

Council meetings

PFMC holds many meetings, including Advisory Panel meetings, Technical Team meetings, Scientific and Statistical Committee meetings, and the meetings of the PFMC itself.

The importance of the PFMC process demands that attendees educate themselves in advance about the issues to be discussed. During these three- to five-day meetings, which are held five times a year, PFMC members and other attendees must sort through large amounts of data and analyses and make decisions that have important consequences to the fishing commu-

nity, the resource, and the agencies involved. As such, they can be very stressful for fishing community members—as well as for PFMC members, staff, and scientists. Meetings are usually held in large hotels in urban areas, which are both culturally and geographically distant from most coastal communities. Because there is a core group of politically active people who attend most PFMC meetings, people who are unfamiliar with the process and the community may feel overwhelmed and confused.

> *"It's a vicious circle, because if you don't trust and you don't have faith that you count in this process, then you're not going to work hard to be part of the process; and if you're not part of the process, you're not going to understand what's going on, and you're even less trustful...it's a sticky messy process sometimes, but the end result, if everyone rolls up their sleeves and gets in and works on it, the end result is a balanced product that fits the needs of the resource and the resource users." [VE, PFMC]*

It is important for fishing community members to understand the PFMC process, to know what takes place at the various levels, and to know which meetings to attend. Meetings of the PFMC's technical and advisory groups are substantially different from those of the general PFMC. For example, the technical team meetings are used to compile information about fish stocks and related issues, so are not the best places for lobbying to occur. Advisory panel meetings are better venues for expressing opinions and learning about the issues under discussion. At technical and advisory meetings, committee or panel members sit around a table, surrounded by an audience of interested parties who can comment at any time by first raising their hands. While these meetings can be intimidating to people who don't know the participants or who are uncomfortable speaking in public, they are more informal and inclusive than general PFMC meetings.

Both PFMC staff and fishing community members recommend that people who want to influence the PFMC develop relationships with advisory panel members:

> *"I usually suggest that the people contact their Council member if it's appropriate. And especially their advisory panel members. It's not that our advisory panel is fully representative, but that's the closest—if you can't go to a meeting, then you have to develop a relationship with your advisor." [PL, PFMC]*

PFMC staff also say that testifying at formal PFMC meetings is a very effective way to have one's voice heard. However, people who testify must be prepared and knowledgeable about decisions that have already been made by the PFMC.

> *"It's very effective for somebody to go and make the investment. But to do it right, though...there has to be an investment there, and that's part of where people are discounted or frustrated. They come in and there's already been three or four days of discussion, and people have [rejected an alternative]...Then somebody comes in later and says, 'well, that's what I wanted.' Their input is going to be discounted just naturally because it doesn't work, so I recommend that people come to the advisory committee...The Council really listens to the advisory committee, and if you can convince them,*

then you're way ahead of just walking in at the last minute." [PL, PFMC]

Many fishing community members have strong reservations about testifying at PFMC meetings, and about the PFMC process in general. The formal nature of communication at the meetings contributes to the divide. Fear of public speaking and the requirement to limit comments to a certain length prevent all but the most motivated people from addressing management meetings. In addition, Daniels and Walker (2001) point out that the comments that do get shared at such meetings tend to be more extreme than those that might be heard from a broader group with more natural dialogue. The following comments are typical of the opinions expressed about PFMC meetings:

"You want to make the process more transparent. Well, the first thing you have to do is learn how to really listen…If I drive two hours to speak my mind at a council meeting and I do not get compensated for my time there, then don't stick an intimidating little light in front of my face and don't interrupt me because you think I talk too much, because I won't be involved with this process if you don't have the time to hear me out. The average guy is not practiced at public speaking, but has just as important of things to say." [Comment on draft groundfish strategic plan]

The council forum is very intimidating. Maybe that's intentional, or maybe it's because it's a public process. It's not user friendly…You're standing a long way from the council; there's a big bank of microphones. [UJ, south coast longliner]

We don't have the time to participate in fisheries management. And if we go we're not respected because we don't have PhD.s or whatever. They would say, "who are you?" [VY, north coast processor]

The formality of the PFMC meeting process arises from requirements that it be recorded for the public record. Full (or overfull) agendas and complex discussions necessitate structural supports such as time clocks and cards to identify speakers. The need for order, predictability, and control shapes the process.

PFMC meetings are located in urban areas because of their convenient access to airports and hotel space. While many fishing community members want meetings to be held in locations that are more convenient to them, PFMC staff say this is impractical because most coastal areas are too hard for other people to access and meeting space may be unavailable.

Fishing community members also feel that meetings are held at inconvenient times. Limited fishing seasons mean that opportunities that are missed cannot be regained. People with small boats and little or no crew feel especially disadvantaged, although these circumstances affect everyone:

"With the limits that are set in place it would be impossible for most of us to give up at least one day of fishing to attend the meeting….I strongly request hearings at a time when the fishermen can be there." [Comment on draft groundfish strategic plan]

When people spend a lot of time and money [to get involved], they get burnt out. They can't afford to miss

fishing time, because they can't make up the fishing time later. Before, if you couldn't catch fish in January, you could catch them in March. Now, that chance is gone. If you wait, you lose. The engine can blow up, the weather can turn bad. [GD, north coast trawler]

While PFMC staff recognize that it is difficult for people to tie up their boats to attend a PFMC meeting, they say that year-round fishing seasons mean meetings will always be held when someone is fishing.

"I think that's the hardest thing for people to do sometimes, to dock the boat for a day and a half and come to Portland, or come to Sacramento, and pay for a hotel room and pay for lunch, and wade through this Council process and talk for five minutes, and then the Council moves on to something else. And letting folks understand that it may seem like a wacky process sometimes, but it's how it works, and it's really the best way for you to…be there and be heard, and hear what's going on." [VE, PFMC]

Fishing community members—particularly those who are uncomfortable with the process—can feel personally and professionally vulnerable at PFMC meetings. Because of this, demonstrations of trust and respect are particularly important in this arena. Unfortunately, many fishing community members do not feel heard or respected by the PFMC. Part of this may be due to the formality of the process. It is also related to the lack of trust described earlier in this report.

I get frustrated when I hear someone say "go to the Council and stand up and give your opinion." It's not true that they are listening. The decisions are made before the public testimony…If you testify, they will listen cooperatively, sometimes—but it is common for them to ask us to not take up their time with our public testimony. [U], south coast longliner]

Council staff recognize that this is a common perception and say that while lobbying does occur before PFMC meetings, it occurs on all sides of the issues. PFMC members must weigh the concerns of lobbyists, scientists, advisory boards, and people who testify at meetings to come up with the best decision possible under the circumstances. They note that people who express their concerns to the PFMC in a calm, organized way are more effective than people who vent their frustrations into the microphone.

"You've got a bunch of guys who have a huge amount of stuff they're trying to make decisions on for one whole week, and then for someone to walk up and yell at them and complain isn't as constructive as a person who comes and says…'this is our situation, who we are, and these are the concerns we have.'" [VE, PFMC]

Many resources are available for improving the effectiveness and efficiency of meetings. One example targeted for the fishing community is *Groups that Work*, an Oregon Extension Sea Grant publication that provides suggestions relevant to fishing groups, town hall meetings, and workshops (Conway 1997). The OSU Extension publication series *Working Together* includes six publications that discuss everything from how to run meetings to how to work through conflict.

One example of a structural change that can improve communication and increase collaborative learning is to have people sit in a circle. This can be an effective way to equalize power relations. Many groups that include people from diverse backgrounds have found this method to be an effective way to foster trust and communication and to ensure that people feel heard. Having neutral facilitators also may be helpful to ensure the success of this meeting format.

Meetings should be scheduled around fishing seasons as much as possible and held when the weather is most likely to be bad. If possible, meeting times should be flexible to accommodate fishermen's unpredictable schedules. While it is important to use every outreach tool possible to publicize meetings, it is also helpful to remember that low turnout to a meeting does not mean that the organizer has failed or that the word isn't getting out. Finally, meetings that target fishing community members should be held in coastal communities, and in venues that are frequented by fishermen.

The written word

For our purposes here, "the written word" includes newsletters and other mailings, flyers and brochures, and reports. Internet newsletters and traditional newspapers will be discussed below.

Newsletters

Newsletters are one of the most commonly used methods of communicating information in the fisheries arena. While the immediacy of the Internet has made newsletters less popular in some sectors, many fishermen lack Internet access or use it infrequently. Newsletters can be read whenever and wherever the reader desires. For agencies, the benefits of newsletters include the fact that they can be tailored to a target audience, they are low-tech and require no Internet skills, they can reach people who do not have computers, and the message is delivered directly to the reader.

However, there are also drawbacks to communicating through newsletters. Writing, formatting, copying, and mailing newsletters can be labor-intensive and expensive. Many newsletters fall victim to labor considerations. The award-winning *Oregon Commercial Fisheries* newsletter, which was published in the early 1970s, stopped publication because staff were too busy to continue publishing it. Similarly, the Oregon Salmon Commission's widely read newsletter, *Tagline*, was discontinued when the Salmon Commission's funding and staffing were reduced as a result of the salmon crisis.

The time required to create newsletters also means that news is delivered more slowly, which is a concern when people need regulatory information. In addition, last-minute changes and corrections are more difficult to make to a newsletter than to a Web site. For this reason, some agencies such as the PFMC are turning more toward the Internet for distributing information about regulations and meetings.

Another challenge for newsletters is that it's difficult to evaluate their effectiveness. Even though circulation numbers may be known, it is hard to tell how many newsletters are actually read. Once they arrive in the mail, only the recipient knows whether they are read, distributed, posted, filed, recycled, or thrown away. The prevalence of word-of-mouth communica-

Major newsletters currently in circulation

Agency or organization	Newsletter name (if any)	On-line?	Frequency
Fishermen's Marketing Association	*Newsletter*	Yes, as HTML	Monthly
Northwest Fisheries Science Center	*Groundfish Outreach Newsletter*	Yes, as PDF	Occasional; may become quarterly
Oregon Dept. of Fish and Wildlife	Status reports on fisheries; occasional targeted newsletters; *Oregon Wildlife* magazine	No	Occasional, except for *Oregon Wildlife* (bimonthly)
Oregon Dungeness Crab Commission	*Newsletter*	No	Occasional
Oregon Extension Sea Grant	*Grenadier Times*	Yes, as PDF	Discontinued
Oregon Extension Sea Grant and Oregon Coastal Zone Management Association	*Oregon Coastal Notes*	Yes, as HTML	Occasional
Oregon Trawl Commission	*The Cod End*	No	Occasional
Pacific Coast Federation of Fishermen's Associations	*Fishlink Sublegals*	Online as HTML, and sent as e-mail	Weekly
Pacific Fishery Management Council	*Pacific Council News*	Yes, in HTML and PDF format	About 5 issues per year
Pacific Marine Conservation Council	*PMCC Quarterly*	Yes, as HTML	Quarterly
Pacific States Marine Fish Commission	*Habitat Hotline*	Yes, as HTML	Stopped publication 12/99; still available on-line
Small Boat Commercial Salmon Fishermen's Association	*Newsletter*	Yes, as HTML	Occasional
West Coast Seafood Processors Association	n/a	E-mail sent to members only	Weekly
Western Fishboat Owners' Association	*Newsletter*	No	Occasional
Women's Coalition for Pacific Fisheries	*Newsletter*	No	Quarterly
U.S. Coast Guard Marine Safety	*Fishing Safety News*	Yes, as PDF	Occasional; also occasional newsletters on specific topics

tion suggests that news travels rapidly throughout the fishing community. Our research did not reveal whether newsletters are shared in a similar manner.

One way to find out who is reading a newsletter is to request that people confirm that they want to be on a mailing list. The PFMC did this in their winter 2000 newsletter, saying, "If we have not heard from you by March 1, 2001, we will remove your name from our newsletter mailing list." They offered several ways to do so, including a postage-paid card enclosed in the newsletter. By April 26, 2001, the PFMC had received 926 responses, effectively whittling the number of newsletter recipients by two-thirds, from 2,882. Other newsletter publishers have found that the number of people who are willing and organized enough to respond to such a request is low. For example, a request sent out with the *Grenadier Times*, a newsletter targeted at the groundfish industry, garnered only a 13 percent response rate. An effort to assess readership of Oregon Sea Grant's publication *Restoration* met with similar results. It is impossible to tell whether these low response rates are because few people read the newsletter or because people fail to e-mail or return the postcards. Other ways to determine who is reading a newsletter are to call a sample of subscribers (also a time-consuming and expensive proposition), offer premiums to people who return surveys, or ask industry groups to poll their members about how they get their information.

One challenge regarding newsletters and other mailings is unique to the fishing community. Many fishermen use PO boxes, and when they are away for long periods of time, their PO boxes can fill up, causing the post office to return mail to the sender. This was a problem with a recent survey sent out by the Pacific States Marine Fisheries Commission. This problem could be solved simply by fishermen asking someone to pick up their mail in their absence or by asking the post office to hold mail until fishermen return.

Because of mailing and copying expenses, it is important for newsletters to be sent to the target population. A great deal of time and effort can go into maintaining an up-to-date mailing list. Conversations with agency and Extension staff showed that there are many existing mailing lists for the commercial fishing community. Some of these are public domain, and some are not. Crew members and people in unregulated industry sectors are more difficult to reach because there are no permit lists available for them. It would be extremely helpful—and probably would require a full-time staff person—to create and maintain a multiagency master database of mailing addresses, permits, and gear types.

Newsletters, like other printed materials, must be written clearly, without excess jargon, and with explanations for acronyms and terms. They must also be written to suit their target audience. This is a challenge when the target audience is diverse:

> *"Am I talking down to them or am I talking over their head? That's a continual challenge in the newsletter, for example. You have a wide variety of interest and expertise in the individuals who read it. Some appreciate every little detail and some of them just want the simple bottom line—more fish, less fish, that kind of thing." [PL, PFMC]*

Despite these considerations, the benefits of newsletters outweigh their drawbacks. Although agencies are increasingly putting their newsletters on-line, it would be a mistake to stop publication altogether. Too many people lack Internet access, and too many are unlikely to search out a newsletter on-line. Newsletters that appear regularly in the mail are an effective communication method.

The table on page 52 provides information on the major newsletters currently in circulation.

Reports and plans

Like newsletters, reports, management plans, and informational letters must be clearly written, timely, and distributed to the right people. Figures, percentages, and tables must be clearly explained. Because of the complex nature of regulatory discussions, agencies sometimes alienate sectors of their audience by assuming that they understand certain terms and acronyms.

> *"The plan needs to have a glossary appended to it." [Public comment about draft groundfish strategic plan]*

In addition, people can be confused by the existence of numerous draft copies. While these might not pose a problem to agency staff, who understand the reason behind drafts, this confusion can lead to anger and distrust in people who don't understand the process.

> *I went to that meeting in Charleston—they had copies of the draft [groundfish] strategic plan. This one [fisherman] had some really good ideas, but he had a different copy and we couldn't follow him. So none of the rest of us knew what was going on. The pages had been changed on the advance copy. It made for a lot of confusion…So it left everybody in the dark, and I almost felt it was on purpose. [LW, south coast troller]*

Although these may seem like minor considerations, avoiding these pitfalls through clear explanation can derail anger and confusion before they start.

Flyers and brochures

Flyers and brochures are a popular and effective way of distributing information, particularly information about meetings and events. Fishermen and Extension agents recommend posting flyers at docks, at marine fuel pumps, in processing plants and buying stations, at port offices, in gear stores, at post offices, in banks, in popular hangouts such as coffee shops, and anywhere else fishing community members are likely to go. Flyers can be posted in windows, stacked on counters, or placed in literature racks. While flyers may be time consuming to post and distribute, they are a very effective way of getting information out if placed in the right locations.

The Internet

> *"Crewmen probably [don't use the Internet] as much, but most of the skippers do. It's because of the availability to look up weather, by the hour. It's really valuable to be able to do that, so everybody's buying a computer…because there is something there that they need, immediately useable." [PT, midcoast troller]*

The Internet's ever-growing popularity and technological sophistication is having an important effect on communications in the fisheries arena.

Because it is easy, fast, and inexpensive, the Internet is increasingly being used to communicate agency information, such as meeting announcements and regulations. Fishing community members are also using the Internet more, though they use it to a much lesser degree than agency staff and scientists.

The Internet is most convenient for people who have frequent access to computers, and who have fast and inexpensive Internet connections. For many who work in offices, the Internet is one of the most efficient ways to communicate and conduct research. However, those who do not have frequent access to computers—or who lack inexpensive and fast connections—are much less likely to rely on the Internet for their communications and information. Many fishermen interviewed for this project said they would rather just pick up a phone and call someone than use the Internet.

> *"Most of 'em aren't sitting at a desk...If you're managing the boat, and you're not fishing the boat, then you tend to be on e-mail more, and fax. Guys that are running the boats, skippers, we don't see it too much." [LM, Extension agent]*

It is difficult to assess what percentage of fishermen use the Internet regularly. Estimates by fishing community members varied from "almost nobody" to "just about everybody." It is clear, however, that as time goes on, more and more fishermen are using the Internet. In addition, e-mails and Web pages are often printed out, forwarded, and posted. As a result, an e-mail newsletter distributed to 50 people may end up being seen by hundreds.

Internet use depends on vessel type, location, comfort using computers, and possibly age. Research by the U.S. Department of Commerce has found that people over 55 are less likely to use the Internet (US Dept. of Commerce 1999). Because many fishermen are in their 50s and 60s, this may be one reason relatively few fishermen regularly use the Internet (Gilden and Smith 1996 a, b). However, this is changing as more fishermen learn about the resources available to them on-line. In addition, many fishermen already use computer technology on their boats, so they may be more willing to use the Internet than others.

The majority of small boats, such as salmon trollers, do not have Internet access on board. This is due in part to space considerations and in part to expense. In addition, boats that take short day trips are less likely to need on-line access because they can use the Internet more easily from home. Larger and more far-ranging boats are more likely to have computers on board for navigation and other fishing-related uses. They stay offshore for longer periods of time and are more likely to have Internet access. Because satellite communication costs $6.75 per minute or more, fishermen using satellite communication are likely to limit their Internet use as much as possible. While they may use it for e-mail and for accessing specific sites that offer buoy and weather data, they are unlikely to spend much time surfing the Web for other information.

Connection speed and expense complicate Internet communications. Dial-up connections typically cost around $20 a month, although free Internet access is available from many commercial providers. Because of low population density, high-speed services such as DSL and cable modems are not as readily available in coastal areas as they are inland. In addition, coastal dial-up connections are often slow and

Using the Internet: short-term actions to improve communication

- Update Web sites frequently.
- Ensure that Web pages are easy to navigate; put important links on the front page.
- As in writing, limit use of jargon and acronyms, and explain terms clearly.
- Limit the number and size of graphics to decrease download time.
- Limit the number of PDFs when possible. If PDFs are provided, offer links to Adobe Acrobat Reader and state the size of each PDF so people with slow connections will know what they're downloading.
- Provide information in both HTML and PDF format when possible.
- For on-line forms, provide printable confirmation that information has been received.
- Provide phone numbers and contact information on the front page—not buried within the Web site.

Using the Internet: long-term actions to improve communication

- Do not expect all fishing community members (or PFMC advisory group members) to have access to or use the Internet.
- Supplement Internet versions of publications with printed versions. Disseminate as with other printed materials.
- Provide useful Web site addresses in newsletters and other mailings to encourage people to discover the Internet.
- Educate fishermen and fishermen's wives about the resources available on-line and how to access them.
- Provide more and better computers to gear stores and other places where fishermen congregate.
- Compile e-mail addresses of fishing community members.

can be disrupted by storms or power surges. Academics and management agency staff who are used to T1 and DSL connections may not realize how long it takes to download information through a 28.8 or 14.4 Kbps modem. A page that takes 1 second to download with a T1 connection takes 13.8 seconds on a 14.4 modem, and studies have shown that, on average, people will not wait more than 14 seconds for a page to download (@Web sites.com 2001). PDF files and graphics increase download times; and if PDF files are not offered with a link to Adobe Acrobat Reader, some viewers will be unable to open them.

Despite these considerations, the Internet offers many benefits to people who use it. For fishing community members who know where to look, the Internet provides fast access to information about weather, ocean conditions, regulations, *Federal Register* notices, safety, marketing, and other topics. In addition to agency and nongovernmental Web sites, there are many commercial sites (e.g., Worldcatch, Seafood.com, Fish Information and Services [FIS], and Gofish.com) that provide fisheries information in various states of timeliness. An increasing number of fisheries-related listservs—such as Fishfolk, NOAA Fishnews, Sublegals, Gofish.com's listserv, Oregon Coastal Notes, and Heads Up! Headlines—provide up-to-date information about regulations and management issues. There is so much information available that many who have Internet access feel overwhelmed by the amount of information that comes to them on-line. Agency staff and fishermen involved in the management process can easily become overloaded with the news, data, and

discussions that appear, often unsolicited, in their in-boxes.

In addition to news and information, the Internet can provide easy access to permitting forms and documents, such as NMFS's permit transfer application. The Web also allows instantaneous feedback to agency staff:

> *I'm finally starting to use the council's Web site. I think it's pretty good…Things get on the Web site faster [than they used to]. We can now do public comment over e-mail, which is a huge help to people. [U], south coast longliner]*

Providing public comment via e-mail, like sending a letter, has several benefits. People can take as much time as they need to compose their comments, and they can send them directly from home or work. In addition, e-mailing provides relative anonymity and helps equalize power relations. However, comments received over e-mail may be given less weight than handwritten letters or comments made in person, though this is not a formal agency policy.

> *"When you get 1,000 postcards or 150 e-mails that just say one line—'I'm opposed to this'—at this point there isn't a formal way of responding to those." [VE, PFMC]*

> *"Unfortunately, letters don't have the effect of somebody standing in front of the Council and speaking to them directly. It's very effective for somebody to go and make the investment." [PL, PFMC]*

Sometimes, because of limited staffing, agencies are unable to respond to the amount of mail they receive. For people who submit testimony via letters or e-mail to feel heard, however, they need to receive some kind of response.

One way to reach people who do not have home or work access to the Internet is to provide access in other places, such as gear stores and libraries. Most public libraries, including the Hatfield Marine Science Center library in Newport, offer visitors Internet access. However, these locations may be too far out of the way for some visitors. Another option is to sponsor Internet access in a location frequented by fishermen. For example, Oregon Extension Sea Grant placed computers at gear stores and port offices to provide access to the Heads Up! Web site. Employees at Englund Marine Supply say that the response to the computer placed there has been very positive. In addition to checking Heads Up!, fishermen use it to check weather and ocean conditions:

> *"We use our computer that you guys gave to us [a lot]. Fishermen know it's there now; they come in; they use it for a myriad of things. Surface temperatures, conditions, weather forecasts, this type of information. It turned out a lot better than I anticipated…We were on it yesterday with a dragger that wanted to get some offshore information, forecasting, that kind of thing."*

Another way to reach fishing community members is to target fishermen's wives. Because fishermen's wives often do the paperwork for their fishing family business—or hold other jobs where they have access to a computer—they are more likely to spend time on-line. Targeting communication efforts to fishermen's wives is a useful strategy that has not been fully explored.

Telephones, faxes, and VHF

Cell phones, faxes, satellite communications, and sideband and VHF radio are commonly used by fishermen at sea to communicate with one another and with people onshore. Their effectiveness in any particular situation depends on range, privacy, and cost. VHF and CB are relatively inexpensive and have long ranges, but they lack privacy. Cell phones are also relatively inexpensive and are more private than radio, but they have short ranges. Satellite communications are relatively private, have long ranges, and allow information to be downloaded from the Internet. However, satellite communications can be extremely expensive. Faxes and satellite communications are used generally by larger and more far-ranging vessels.

The switch from VHF to more confidential forms of communication is having a wider effect on the culture of the fishing fleet. The codes that were once used by vessel captains to disguise information are used less frequently in the era of cell phones and satellite communications.

> *"We used to [use codes] a lot 10–15 years ago before cell phones were really available…It was just hilarious, 'cause there was this constant struggle to keep ahead of the rest of the fleet's technology. So you could have secret radios, people really were buying, on average, a radio a year, just to get something that was a little more 'covert,' like having an extra channel or some scrambling device. Before that, it was even more fun, because everyone had the same radio so you had to use all this cryptic language and these codes…it was just hilarious. Some of the codes were just entertainment in themselves…" [PT, midcoast troller]*

In some sectors of the industry, faxes are now the medium of choice because their ability to communicate large amounts of data in a short time keeps costs down. ODFW and processors commonly use faxes to disseminate information about regulations and catch limits. Some fishermen also believe that faxes are more private than other technologies. While technology to intercept both fax and analog cell phone transmissions does exist, neither is as easy to intercept as VHF:

> *"[Listening in to the VHF] is just expected. You're bored, you're gonna listen in to the radio." [JK, midcoast troller]*

The public nature of VHF can be particularly troublesome when fishing family members use the radio to communicate with one another. Cell phone technology is warmly welcomed by fishing family members who do not want the entire fleet to overhear their personal conversations.

As noted above in the section on the Internet, many fishermen (and some management personnel) prefer talking over a telephone over sending an e-mail or wading through Web sites to find information. Telephones are the next best thing to face-to-face communication, and the ability to hear vocal tones and emphases helps prevent some of the misunderstandings that can occur with e-mail. Telephone conversations can also help develop rapport and understanding. Calling agency offices directly is often the fastest and most effective way to get information:

When I called the PFMC office to get copies of the groundfish plan, they were very nice and mailed the information right out. I would think they would be accommodating to anybody calling them. Call them. My little lecture is, "Don't get the information from somebody else, get it yourself and read it and figure out what it means to you." [UJ, south coast longliner]

"A lot of the guys'll call three-four times a day and just want to chat. They want to shoot the breeze because they get lonesome on the water, or they're mad at their crew and their crew won't talk to 'em." [GU, north coast processor]

Extension agents say that calling people the night or morning before a meeting is one of the best ways to ensure a high turnout. Although it takes time to call people, it gives them the impression that their attendance is important and that the event will be worthwhile.

The Coast Guard regularly broadcasts its Notice to Mariners over VHF, and important and timely regulations can be disseminated through this channel. Other uses for VHF have also been tried. Several years ago, the Extension Sea Grant office in Newport experimented with using VHF to communicate with the fishing fleet. Radios were provided to each agent, but because agents were frequently out of the office, the radios were seldom used. The need to constantly monitor the radio made them impractical in this circumstance, but other experiments with VHF might prove to be more successful.

Television, radio, and newspapers

Television, radio, and newspapers are common ways to disseminate information, particularly by agencies who send out news releases. One common way these media are used is to publicize meetings and events. The effectiveness of using these media depends in great part on the size of the community they serve and the media outlet's relationship to the fishing community. In Port Orford and Astoria, for example, the local newspapers take an active interest in the fishing community and are widely read by fishing community members. A meeting notice in the *Oregonian* or the *Eugene Register-Guard* would be much less effective. In the case of television, announcements can be posted on local cable or public access stations. Local radio stations in some markets are very effective ways to get out information about fisheries-related events. Often, these media will run notices for free as part of their community announcements. One drawback to announcing meetings through these outlets is that they will not reach fishermen who are out at sea. However, they may reach their onshore partners.

Another way to disseminate information is to develop close ties with reporters working for local newspapers, radio and television stations, and widely read magazines such as *Pacific Fishing* and *National Fisherman*. However, this takes some of the control away from the organization or agency. If a reporter is trying to make a specific point, there is a danger of being quoted out of context or misrepresented.

The public only knows what it reads in the Oregonian, which is 99 percent bullshit. And never gets anything right, and it's a disaster all the time…I see a real need to educate the public, and nobody's doing it. [WT, midcoast trawler]

Working with newspapers

- Develop working relationships with reporters in local newspapers, and use those newspapers to disseminate information.
- Recognize which newspapers are most likely to be read by fishing community members. Write articles and op-eds specifically for these newspapers.

Organizations have tried other ways to work with the media. PMCC staff have published guest op-eds in the *Daily Astorian* and the *Oregonian*. They have also tried to work with local radio stations. For example, they planned to air a biweekly fisheries report on local radio. This plan foundered when the radio station wanted them to develop scripts far in advance of the airing date, which required more staff time than they had available and would have made the information less than timely. PMCC may develop a weekly radio update to be aired on a public radio station.

One last method that has not been used to reach fishermen, but which has been used to reach coastal tourists, is low power radio. Low power radio uses small AM transmitters that cost about $3,000 and have very localized coverage. Low power radio has been used at the mouth of the Columbia River to provide navigation information; at the Port of Newport, to educate visitors about the history and sights of the area; at Boiler Bay State Park, to provide tips on how to spot migrating whales; and in many other places.* Although a low power radio station would reach only fishermen at port, it offers an interesting alternative

*For more information on low power radio, see Oregon Sea Grant's web page, http://seagrant.orst.edu/extension/lpr.html or contact Bruce DeYoung at Oregon State University.

to broadcasting on commercial radio stations.

CONCLUSION

A bumper sticker neatly summarizes one positive step toward improving communications: *Eschew Obfuscation*. In other words, avoid using unnecessarily complex and vague terms to communicate meaning. A commitment by the management community to "eschew obfuscation" would be a healthy first step toward improving communication in the fisheries arena.

More long-term steps, however, are not as straightforward. This project is not the first, or the last, study of communication between these communities. Many other researchers, managers, and fishing community members have pointed out the need to improve communication and have tried various ways of doing so. The solution lies not in merely avoiding jargon or meeting for coffee, but in acknowledging differences and in making improved communication a top priority.

As long as managers, scientists, and the limited number of fishing community members on the PFMC have the power to regulate the activities of the fishing community, structural inequality will exist. This inequality, as inevitable as it might seem under the current circumstances, contributes to feelings of distrust and helplessness on the part of the fishing community. It is an underlying factor that influences all communications between the groups. An open acknowledgment of this inequality and other troublesome issues would contribute to a sense of transparency and increase trust.

Research that is truly collaborative provides another way to deepen trust and increase the fishing community's involvement in management activities.

Both fishing community members and management staff complain that they do not have enough time nor funding to engage in meaningful communication. In order to set aside the time and resources to communicate effectively, both groups must commit to making communication a top priority. Communication efforts must be supported by funding, staffing, and the deep body of knowledge that already exists in industry, management, and academia.

For communication to become a priority, funding agencies, administrators, decision makers, and Congress itself must be educated about how ineffective communication contributes to crises, distrust, and lack of participation in management. They must be educated about the short- and long-term benefits of communication, which include more informed citizens, improved relationships, more accurate data, and greater opportunities for innovative and effective management. Regaining trust is crucial to the future of fishing community-management relations. Improved communication—which includes listening, tolerance, and both formal and informal methods—is one of the best ways to improve trust.

Improving communication between the fishing and management communities will have to take place on many levels, from individual efforts to agencywide initiatives. Appendix A provides an overview of suggestions for making communication more effective, both in the short term and the long

term. Many of the suggestions echo those of other studies. For example, participants at roundtable discussions sponsored by the John Heinz III Center developed many general findings similar to those listed here. They also developed other useful suggestions that did not surface in our interviews, such as establishing a socioeconomic research fund that participants in state and federal fisheries would pay into, involving social scientists early on in the development of fishery management plans, and developing comprehensive training and orientation courses for new PFMC members.

Many of these suggestions also resemble those reported by Harms and Sylvia (1999), who surveyed industry members and management on how to improve the working relationships between industry members and scientists. Among other things, their suggestions included having scientists accompany fishermen on fishing vessels and organizing an independent, formal cooperative research organization.

Like a stock assessment, this assessment of communication takes place in a shifting and interconnected world. The commercial fishing industry, management agencies, natural resources, and public values are all changing rapidly. New communication technologies are affecting how the industry communicates with itself, as well as with management. The speed and convenience of the Internet must be balanced with the personal connection gained from word-of-mouth communication. While technology changes and individuals move on, however, the fundamentals of successful communication remain. Listen, talk, trust, learn—and eschew obfuscation.

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APPENDIX A: SUMMARY OF RECOMMENDATIONS FOR IMPROVING COMMUNICATION

Key

- Fishing community
- Management/scientific community
- Individual fishing community members
- Individual management agency staff

General, big-picture actions to improve communications

Fishing community, Management/scientific community	See communications as an investment in better fisheries management.
Fishing community, Management/scientific community	Make outreach, education, and listening organizational priorities. Persuade staff and members that communication—both formal and informal—is an important investment that must be supported.
Fishing community, Management/scientific community	Promote management measures that reduce competition between fishing vessels and gear types.
Fishing community, Management/scientific community	Work to get adequate funding; provide appropriate staffing for organizations, agencies, and research; and reduce overwork.
Fishing community, Management/scientific community	Educate your own and other organizations and agencies about organizational roles, responsibilities, and processes.
Fishing community, Management/scientific community	Support efforts to give fisheries students a holistic education (such as the Oregon Marine Fisheries Collaborative Fellowship).
Management/scientific community	Improve internal communications through informal events, regular staff meetings, intra-agency newsletters, etc. Promote agency morale and communication through informal meetings and meeting areas.
Fishing community, Management/scientific community	Recognize the importance of communication and the challenges that are inherent in communicating within and between both communities.
Fishing community, Management/scientific community	Commit to making improved communication a personal priority.
Fishing community, Management/scientific community	Support intergear organizations. Recognize the importance of reducing intergear conflict.
Management/scientific community	Promote changes in the Paperwork Reduction Act.

Actions to promote trust (and improve communications)

	Communicate your organization's willingness to listen to people in the management or fishing community.
	Encourage willing employees to interact informally with fishing community members—on the docks, on boats, in coffee shops—wherever possible.
	Provide customer service training.
	Show interest in what other community members have to say. Demonstrate trust in others.
	Take opportunities to interact informally with members of both communities. Develop working relationships with other fishing and management community members. Ask them to pass along important information.
	Learn and practice "active listening" and "direct expression."[1]
	Recognize—and when possible, acknowledge—that distrust exists.
	Be humble. Acknowledge ignorance.
	Challenge stereotypes.

Actions to improve outreach

	To disseminate important information, use all outreach methods, including • working with Extension agents • targeting fishermen's wives groups and individual fishermen's wives for communication efforts • personal calls to key individuals and organizations • letters to fishing associations and mailing lists • radio interviews and announcements • newspaper articles and announcements • Heads Up! and other Web sites and listservs • flyers or handouts at docks, marine fuel pumps, processing plants, buying stations, banks, local grocery stores, port offices, Extension offices, gear stores, coffee shops, restaurants, and other relevant locations. Stack on counters and place in literature racks. • press releases • TV station bulletin boards
	Encourage vessel captains to pass along information to crew members.
	Use the interest generated by fishing crises to involve fishing community members in meetings, workshops, research, and other efforts.
	Disseminate existing publications that explain the assessment and PFMC processes.
	Add yourself to relevant mailing lists.
	Make sure that PO boxes are regularly emptied during long absences.

Continued

	To get information quickly, call PFMC, advisory panel, and agency staff, and check relevant Web sites.
	Keep in mind that personal letters may be more effective than e-mails.
	Type letters, or write legibly, when corresponding with agency staff. Be as clear as possible.
	When addressing the PFMC, be well-prepared and educated about the PFMC process and the subject at hand. Attend PFMC advisory group meetings. Ensure that your suggestions are relevant and timely. Avoid excessive public displays of anger.
	Recognize that management staff are often overworked.
	Recognize that fishermen are busy running their businesses. Provide relevant and timely information. Inform fishing community members if something is going to affect their bottom line. Emphasize the relevance of information when publicizing meetings and workshops. Use clear examples of how and why information is relevant to their fishing businesses.
	Take advantage of existing databases of newspapers, radio stations, and other media that commercial fishermen read and listen to.
	Talk to liaisons and fishing community members to determine which locations in each port are most convenient for the industry.
	Listen to comments and questions, follow up, and get information back to people who request it.
	Respond to correspondence from fishing community members in a timely manner.
	Do not assume everyone knows what you're talking about. Be as clear as possible. Avoid acronyms and jargon. Define terms; explain tables. Ask people outside the fisheries management arena to review written materials meant for the fishing community.

Actions to improve data

	Support collaborative research strategies where fishermen have an opportunity to help define the research questions. Consider creating a technical advisory committee in which fishermen and scientists collaborate in framing priority research questions and topics.
	Devote time to developing a complete database that includes names of boats, captains, owners, and fisheries; e-mail addresses, fax numbers, cell phones, mailing addresses, and other information.
	Develop a registry of crew members.
	Increase the number of social scientists working for management agencies.
	Educate yourself and others about collaborative learning opportunities and benefits.[2] If possible, participate in collaborative research projects.
	Review existing social research about the commercial fishing community.
	Educate people about the process and the nature of science.
	Coordinate social research with other agencies and universities to avoid "survey fatigue."
	Limit the length of surveys. Work with universities to ensure effective survey research methods.

Future communications projects

	Establish an ongoing series of informal meetings between fishing community and management community members.
	Explore uses of VHF and "low power radio" to communicate with the fishing community.
	Develop a publication that explains terms and acronyms used in fisheries management. Make it widely available.
	Consider innovative applications for video—for example, providing a "video booth" at PFMC meetings where fishing community members can express their opinions on tape.
	Consider innovative ways to promote informal communication, such as renting a waterfront storefront and serving espresso—and information—to fishermen.
	Study in more detail how agency cultures affect their external communications.

[1] *See charlotte.bcentral.com/charlotte/stories/1997/01/06/smallb1.html for a basic article on active listening; also see Conway (1999)*

[2] *See Daniels and Walker (2001).*

APPENDIX B: ACRONYMS USED IN THIS PAPER

CB	Citizens' Band (radio)
DSL	Digital Subscriber Line (high speed Internet connection)
EPIRB	Emergency Position Indicating Radio Beacon
ESA	Endangered Species Act
FIS	Fish Information and Services
GDOP	Groundfish Disaster Outreach Program
HMSC	Hatfield Marine Science Center
HTML	Hypertext Markup Language (Internet format)
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OCZMA	Oregon Coastal Zone Management Association
ODFW	Oregon Department of Fish and Wildlife
OMB	Office of Management and Budget
OSU	Oregon State University
PDF	Portable Document Format (Internet format)
PFMC	Pacific Fishery Management Council
PMCC	Pacific Marine Conservation Council
PO	Post Office
PRA	Paperwork Reduction Act
PSMFC	Pacific States Marine Fisheries Commission
T1	"Telecommunications 1" (high-speed Internet connection)
UN FAO	United Nations Food and Agriculture Organization
VHF	Very high frequency (radio waves)
WCPF	Women's Coalition for Pacific Fisheries
WFOA	Western Fishboat Owners Association

APPENDIX C: SAMPLE QUESTIONS USED DURING INTERVIEWS

- What does your organization do, and how you fit into it?
- Who does your organization serve?
- How would you describe the communication *within* your organization?
- How about *between* your organization and other organizations?
- What goals does your organization have regarding communication?
- How do you communicate with your members/clients? What printed, Internet, or informal methods do you use? How do you disseminate them?
- How do you get feedback about your organization?
- What percentage of your communication is done via the Internet? Do you think it reaches your clients?
- Do you face any special challenges in communicating? What?
- How do you think people in this organization view members of the fishing community/agencies/ processors?
- Where do you get the information that you use in your work? (What newsletters, Web sites, word of mouth, newspapers, etc.?)
- How useful would you say the following are: the PFMC newsletter, the PFMC Web site, information from ODFW, information from NMFS (do you ever check their Web sites?)
- What sources of information do you trust the most? The least?
- Where do you have your Internet access (home, work, elsewhere)? If not at work, what kind of connection do you have (modem, DSL, free or not)?
- What other issues affect communication within this organization and with other people/organizations?
- How would you describe communications within the commercial fishing community/agency community?
- How many fishermen would you estimate have Internet access?
- How well do you feel you understand other organizations/industry communities?
- What do you think of the PFMC's communication methods? NMFS? The commercial fishing community?
- If people don't communicate, why not?
- How much do you think people want to know?
- How would you improve communication in the fishing/management/ processor community?
- Do you read Heads Up? How often?
- Do you ever submit stories to Heads Up? How often? How easy is it to submit stories?
- What do you think of Heads Up? How useful is it?
- Do you read any other commercial fishing Web sites? Which ones?
- What could we do to make it easier for you to submit stories?
- What could we do to improve Heads Up?

APPENDIX D: SUMMARY OF COMMUNICATION NEEDS AND METHODS

Group	Communication needs (incoming)	How they get information	Outgoing communication needs	How they send out information	Issues
Active fishermen	Weather information	Word of mouth, telephone, VHF, Internet, Coast Guard, other	May communicate weather information to peers	To peers: radio, word of mouth, phone	Extremely important information. Need accurate data quickly
	Regulations/ management information	Word of mouth, telephone, newsletters and mailings, faxes, port biologists, Extension agents, industry groups, fishermen's wives groups, gear stores, Internet, other	Need to communicate data, opinions and priorities to management agencies	Letters, phone, word of mouth, attending meetings, e-mail (rare)	Mistrust of management and data; cultural differences between industry and management; stereotyping (on both sides); resentment, anger, feeling that they're not listened to. Need accurate data quickly.
	Intra-industry communications	Word of mouth, radio, cell phones, faxes, other	Depends on who is involved	Same as incoming	Confidentiality, secrecy, competition with other boats/gear types/ fisheries; safety; fishing success
	Safety information and regulations	Coast Guard, word of mouth, Extension agents, Internet, gear stores, other	Communicate feedback to Coast Guard	Phone, word of mouth, e-mail (rarely)	Need to make sure they have correct information; some resentment about cost and red tape

Group	Communication needs (incoming)	How they get information	Outgoing communication needs	How they send out information	Issues
Fishing industry suppliers	Need correct data about safety and management to pass along to fishermen	All available methods	Need to be sure they are passing along accurate data regarding safety, regulations	Word of mouth, passing along printed material, sponsoring meetings	Must be sure data is correct; must be careful not to appear biased toward any particular gear type or fishery
Fishing family members	Same as for active fishermen, plus education, retraining, improving family communications during absences	Same as for active fishermen, plus local social service agencies	Need to communicate family information to absent fishers; may be involved in lobbying for the industry	Cell phone, radio, e-mail, videos mailed to absent fishermen, attending meetings	Confidentiality; difficulty of communicating personal information to fishermen over distance and time
Coast Guard	Need technical data about safety at sea	From fishermen: word of mouth, written correspondence	Need to communicate safety information, regulations, data to industry members	Boarding fishing boats; conducting dockside exams; Internet; meetings, other venues; mailings, press releases, radio	Need to try to reach as many fishermen as possible; must deal with resentment and reluctance
Management agencies	Depends on agency; need input from fishermen about proposed management measures, or involvement in developing regulations. Need to communicate with scientists, other agencies, public.	Depends on agency, but from fishermen: letters, phone calls, e-mails (rare), testimony at meetings, involvement in working groups. From scientists and agencies: reports, presentations, e-mail, other methods.	Need to communicate regulations and management information to industry members; need to educate industry about agency responsibilities, processes; need to coordinate with other agencies; need to communicate with general public, policymakers.	Newsletters, Internet, mailings, meetings, press releases, articles, presentations, face-to-face interaction	Must deal with industry members' distrust and anger; must communicate complex and confusing information to industry, public, others; cultural differences between agencies and fishing industry; limited staff time, limited funding; internal politics; sometimes low morale

Group	Communication needs (incoming)	How they get information	Outgoing communication needs	How they send out information	Issues
Scientists	Need data for stock assessments, other projects	Logbooks, surveys, port biologists, collaborative research projects, colleagues, other sources	Need to communicate science to management, fishermen, public	Meetings, newsletters, Internet, sometimes word of mouth	Difficulty in communicating complex findings; must deal with distrust, anger; limited staff time; limited funding; scientists not usually trained for customer service work
Processors	Marketing, food safety, processing information, regulation information, information from incoming vessels about products; communicate with other plants, buying stations, trucking companies.	Industry publications, agency faxes and newsletters, phone, word of mouth, Internet (sometimes), WCSPA, OSU Seafood Lab, other	Need to communicate limits and regulation information to fishermen; need to communicate with PSMFC about observer programs; business communications with other plants, buying stations, trucking companies, sellers	Phone, radio, fax, in person, Internet	Must have current information about catch limits, quotas, etc. Must compete with other processors; changing Internet technology increases level of competition
Industry groups	Need feedback about industry members' views, priorities; other types of data	Feedback: Probably word of mouth, phone, e-mail, etc.	Need to discuss regulatory changes, policy issues with members; need to inform members of news relating to the industry	Newsletters, Internet, phone, meetings	Intergear groups must be careful not to appear to be aligned with a particular gear type, fishery, or geographic region; must avoid internal politics relating to intergear conflicts

Group	Communication needs (incoming)	How they get information	Outgoing communication needs	How they send out information	Issues
Extension agents	Need all types of data to pass along to many different groups	From as many sources as possible	Communicate all types of information relevant to the fishing industry	Newsletters, meetings, Internet, word of mouth, brochures, reports, workshops, presentations, articles, other ways	Often called upon to fill in for lack of communication by other parties; must remain politically neutral; must favor no particular gear type or industry; must be generalists; no regulatory power

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INDEX