

OREGON'S CHANGING COASTAL FISHING COMMUNITIES



EDITED BY JENNIFER GILDEN


Sea Grant
Oregon

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Sustainability and Community: An Overview

Oregon's fishing communities are experiencing a difficult transition that is challenging everyone involved—fishers, processors, families, managers, scientists, and the public. Economic, environmental, and social changes are placing pressure on the delicate net that holds Oregon fisheries together, and fishing communities are finding themselves increasingly entangled in a complicated web of conflicting needs and requirements.

The 1996 revision of the Magnuson-Stevens Fishery Conservation and Management Act (referred to as the “Magnuson-Stevens Act”) recognizes the importance of human communities and their relationship to the fisheries. Among other things, it declares that fishery conservation and management should take into consideration the importance of fishery resources to fishing communities, with the goals of providing for the “sustained participation” of those communities in fisheries and minimizing “adverse economic impacts” as far as possible.

The changing focus of the Magnuson-Stevens Act highlights the importance of cooperation between the social and biological sciences. While biological, oceanographic, and ecological data are crucial for understanding fisheries, so is an understanding of human communities, values, and responses to change. Management's focus on fish has diverted attention from important social issues that must be addressed in order to support fishing businesses and families, who are, after all, the people who rely on healthy fisheries. The act's focus on communities represents a shift taking place in all areas of natural resource management toward recognizing that resource management means managing people.

A community focus raises complex questions about the significance of fishing communities, how we identify them, and what we know about them. Fishing communities are complex, changing centers of action for fisheries. They are composed of independent people who do not fit easily into neat categories and who rarely, if ever, present themselves as a homogeneous group. Although some see the fishing community as a single entity, it actually consists of many communities based on gear type, fishery, and geography.

Due in part to the socially and geographically diverse nature of fishers and fishing families, data on these communities have not been systematically gathered. It is difficult to pin down the number of people employed, partly because the occupation of fishing is not like more stable occupations. Fishing takes place at sea and draws people who enjoy being their own boss and making their own schedule. Constant changes in market prices, weather, regulations, and other factors demand that fishers remain versatile. They do not work nine-to-five jobs with time cards, workers' compensation, benefits, paid vacations, and consistent records of how time is spent. Technically, vessel captains do not even have employees—crew are considered by the IRS to be self-employed contractors. Because the state issues “John Doe” crew licenses, there is no complete list of names and addresses of people who work on fishing vessels, even if they are licensed. And many crew members are itinerant, moving from port to port and job to job.

Other factors make it difficult to collect data on fishing businesses. Because of the relatively small number of participants in the fishing industry nationally, federal labor statistics combine fishing as an occupation with forestry and farming. Concern about identifying individuals, businesses, or privileged information also limits the publication of economic data that would be useful for distinguishing the economic importance of fishing activities.

The uncertainty of the data at the business level extends to the community level. Data on communities are typically gathered for incorporated places or by county, whereas many fishing communities are in unincorporated areas or are parts of incorporated communities (see figure 1).

Many studies have looked at fishing communities and the issues associated with them (see Appendix C: Annotated List of Related Studies). Although these studies have been mostly one-time projects with no consistently collected long-term data sets, they provide a useful starting point for fishery managers and people interested in the history of Oregon's fishing communities to compare with current conditions. Much of the

research focusing on the West Coast was conducted through Oregon Sea Grant and by private consultants.

Oregon's Columbia River fishing communities, and some coastal fishing communities, have endured for a century or more. Archaeological evidence shows that tribal fishing communities have existed on the coast and in the interior for thousands of years. During and after World War II, fishing communities grew with the expansion of ocean fishing and developments in fishing technology. This publication focuses on the post-World War II period on the Oregon coast (figure 1) and brings together research and other sources of information that explore the problems of defining, identifying, and sustaining Oregon's fishing communities. To illustrate the character of what is known, we use snapshots of Oregon's coastal fishing communities at various times (Appendix A).

The Magnuson-Stevens Act links the concepts of sustainability and community. In the following section, we examine the concept of sustainability and review its use and effectiveness. Then we discuss the complexity involved in defining "community."

Sustainability: Real? Possible?

Since the 1930s, "maximum sustained yield" has embodied the hope of maintaining environmental productivity while also producing sustained growth (Mason and Bruce 1931; Russell 1942; Steen 1984). In the Northwest, the concept was applied to fish and forest resources after World War II. The word "sustainable" has also become a modifier for agriculture, development, economics, energy, environment, fisheries, forestry, futures, growth, livelihoods, communities, and the world.

Sustainability can have a number of meanings, depending on what people value (Gale and Cordray 1994). It may mean maintaining long-term viability, minimizing human impacts on ecosystems, or sustaining growth. Usually, it means being able to continue living in a habitat or using a resource in the same way well into the future. In fisheries, sustainability has been defined as fishing at the level of maximum sustained yield (MSY).



Figure 1. Northwest coastal commercial fishing communities

Fishery scientists have a half-century of experience trying to move toward sustained yield management (Ricker 1975; Larkin 1977). MSY is institutionalized in legislation establishing fishery management practices. MSY is "the largest average catch or yield that can continuously be taken from a stock under existing environmental conditions" (Ricker 1975:4). Similarly, the 1996 Magnuson-Stevens Act defines MSY as "the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions" (600.310.c.1).

The MSY management approach currently used in fisheries and forestry has not been successful. In 1993, one-third of Pacific coast stocks were overutilized (NMFS 1993:11). Since that time, the number of overutilized stocks has doubled, with many groundfish stocks being added to the list (PFMC 1998).

Forestry, which has a longer history of sustainable community management, has been no more successful (Hibbard and Elias 1993; Schallau and Alston 1987; Hibbard and Davis 1986). Oakridge and Westfir, timber-based communities southeast of the Eugene-Springfield urban area, are examples. The U.S. Forest Service promoted the sustainable development of Oakridge and Westfir beginning in 1923. At that time, the Forest Service's objective was to ensure a continuous

supply of timber so that “a stable community [could] be established to provide decent living conditions and to encourage family life” (Jensen 1970:80). After World War II, Pope and Talbot built a mill at Oakridge. As Roch Bradshaw wrote in *Northwest Magazine* (October 5, 1947), “The company plans to work on a sustained yield basis, so that its operations will be permanent.” Despite these good intentions, Oakridge and Westfir’s fortunes plummeted in the late 1980s as timber supplies declined and mills closed. Undaunted, in 1994 Oakridge and Westfir proposed a timber trust to create “more than 100 permanent local jobs at good wages” (Hamburg 1994:B2). Loss of population in the communities provided cheap rents sought by welfare recipients from the Eugene-Springfield area, leading to further demands on the communities’ strained resources.

In fisheries, sustained yield management rests on the ability to do two things: determine the acceptable biological catch and constrain fishing effort. Determining the acceptable biological catch to achieve the maximum sustained yield is extremely difficult and requires considerable research. A fish stock is a dynamic and changing system influenced by—and influencing—many other system conditions. The acceptable biological catch is affected by highly variable conditions such as water temperatures, upwelling, age class strength, and the interaction between populations of predators, including fishing, on the stocks. At best, the MSY is a dynamic estimate.

Once the acceptable biological catch has been estimated, the next step is to set the total allowable catch, typically at a level lower than the acceptable biological catch, and constrain fishing effort so it does not exceed it. This process is also difficult, as it depends on human behavior as well as the behavior of fish stocks. The problem is compounded by the fact that fishing capacity in all of Oregon’s major fisheries exceeds what is needed to take the total allowable catch.

The sea urchin fishery is an instructive example in the control of fishing capacity. Although sea urchin harvesters agreed to capacity controls from the start, they still ended up with more capacity than needed to take the total allowable catch. Even if the number and size of fishing boats and gear are controlled, fishers continue to improve their ability to catch fish (Smith and Hanna 1990). This increase in efficiency means that if we were to ensure sustainability, boats and gear would have to be retired continually or their capacity constrained. For most fisheries, getting a closer match

between allowable catch and fishing capacity has not been successful.

National Standard 8 of the Magnuson-Stevens Act establishes the goal for fishing communities of “providing for the sustained participation of those communities and minimizing adverse economic impacts to the extent practicable.” The act goes on to say, “The term ‘sustained participation’ does not mandate maintenance of any particular level or distribution of participation in one or more fisheries or fishing activities. Changes are inevitable in fisheries, whether they relate to species targeted, gear utilized, or the mix of seasonal fisheries during the year. This standard implies the maintenance of continued access to fishery resources in general by the community” (50 FR 41911).

Community and Sustainability

Addressing this question requires new approaches to sustainability and to the resources available to fishing communities. In the following section we discuss these new approaches, give a summary of resources available to assist fishing families, and suggest general and concrete actions for management.

If neither fishery nor forest management has been successful in achieving sustainable communities, does this mean sustainable fishing communities are not attainable? Fishery and forest management have tried to maintain sustainable communities by controlling the harvest of fish and trees. Since the 1930s, the assumption has been that if biologists could reliably predict stock production, then managers could build a sustainable fishery based on their predictions. However, predictability has been elusive. In most cases fisheries go through an initial fishing down process, followed by an attempt to reach equilibrium, and often continuing to decline to levels where stock viability becomes a concern (Smith 1986; Hanna 1997b). But even if the sustainable harvest level were known, improvements in fishers’ ability to harvest these resources means that stable supply will sustain fewer and fewer people over time.

If the goal is indeed to maintain sustainable fishing communities, perhaps human communities should be the focus. Sustaining fish and forest stocks without asking what it means to sustain human communities often leads to communities outstripping available resources. Sustainability must account for the demands of a community’s economic system and the markets that govern choices in such a system.

Sustainability may also focus on the cultural, social, and spiritual factors important to communities. Interruption of a community's socioeconomic system, whether based on dipnetting at Celilo Falls, gillnetting the Columbia, or launching dories at Pacific City, can deeply affect people's self-image, cultural identity, and spiritual outlook.

The pursuit of sustainability requires communities and management to reassess their values and their accustomed ways of dealing with problems. For example, communities frequently desire sustained economic growth, which requires them to continually increase their economic productivity. Developing value-added elements in the fishing industry is one way to do this, but it is unlikely to increase fishing opportunities. Sustaining economic growth through fishing requires finding new fish stocks or augmenting existing fish stocks. The coho salmon fishery's reliance on hatchery stocks was an attempt to do this, but the results were unsustainable.

In another example, decision makers in the current management process consult fishing community members, but the fishing communities themselves have no responsibility for or ownership of the decisions. As a result, fishers blame managers for not protecting the resources from habitat, hydropower, and other losses, and managers blame fishers for the politics that allow higher catches than they believe are sustainable. If the fishing community has more of a stake in setting sustainability goals, conducting research to calculate allowable catches to meet these goals, and helping with enforcement when catch limits are set, they will have a greater investment in the management process.

Some commercial fishing communities are taking their own steps toward sustainability: industry-funded salmon restoration projects such as the California Salmon Stamp Program; industry-funded buyouts to reduce fishing capacity; and an overage program in which over-the-limit catches are sold and the proceeds used to fund research into the status of fish stocks. In 1996, Salmon for All, a lower-Columbia River group of fishers, processors, and gear suppliers, developed a business plan with support from the Bonneville Power Administration. This plan was an effort by those involved in the salmon fishery to gain more control over their future within the current framework of management and economics; sustainability of a viable commercial salmon fishery in the lower Columbia was one of their primary goals (Salmon for All, 1996). The Washington commercial salmon fishery has also

cooperated with Washington State to develop a long-range, industry-supported business plan (Stuart 1993).

Changing management's focus from fish stocks to fishing communities will not occur rapidly. Like communities of fish, human communities are complex, structurally diverse, and difficult to define and manage.

Defining Communities

The word "community" has many meanings and connotations, and people often use it to create the positive sense of people living and working together to achieve desirable goals. The world is described as a "community of nations." Universities and large corporations talk about their "campus community." Many people live in a "local community" and telecommute to their "virtual community." Some social scientists suggest the importance of community-based management (Costanza et al. 1998; McCay and Acheson 1990; Pinkerton 1989). Many feel that if fishing communities were given more say in management practices, resources could be better sustained.

Section 312 of the Magnuson-Stevens Act defines community as "geographic areas encompassing a specific locale where residents are dependent on fishery resources or are engaged in the harvesting or processing of these resources" (62 FR 41911). Although this describes many of Oregon's fishing communities, other definitions provide a more complex portrait. Following are some common definitions of "community":

- "Communities of place" are what we usually think of when referring to communities: the towns, cities, villages, and other geographic areas where people live.
- "Communities of interest" are based on the common interests of their members. Business and trade organizations, commodity groups, and clubs are some examples of communities of interest.
- "Occupational communities" form around common occupations, like shrimping or gillnetting. The concept of occupational community was introduced by Lipset in 1956 with his work on a printer's union, and Davis (1986) expanded its defining characteristics. Carroll and Lee's (1990) work with Northwest timber workers describes an occupational community that is similar in many ways to those found in fisheries. For further informa-

tion on occupational communities based on fishing, see McCay and Jentoft (1998) and Gatewood and McCay (1990).

- “Natural resource communities” comprise people who live in a certain area and whose primary cultural existence is based on the use of certain renewable natural resources (Dyer and McGoodwin 1994). Communities that are highly dependent on fishing, forestry, farming, and mining are some examples.
- Shaffer and Anundsen’s (1993) definition covers many different community types. For them, a community is a dynamic whole that emerges when a group of people participate in common practices, depend on one another, make decisions together, identify themselves as part of something larger than the sum of their individual relationships, and commit themselves for the long term to their own, one another’s, and the group’s well-being.

The word “community” is continually taking on new connotations. For example, Munro et al. (1998) link share-based management in fisheries with virtual communities. Tradable individual or community shares are meant to let the market take care of allocation. Virtual communities develop when shareholders come together to act in their common interest. Virtual communities can also be based on gear groups, interest groups, and other communities of interest.

Oregon’s coastal commercial fishing communities (Appendix A) reside within larger communities of interest and place. They are dynamic, growing and declining as policies and economic opportunities change. Fishing communities are particularly sensitive to world economic and political events. Economic problems in Asia can reduce demand for certain fish products or result in buyers purchasing from cheaper suppliers. Record salmon catches in Alaska or surpluses of pen-reared salmon can depress salmon prices and strongly affect Oregon fishing communities.

It is important to note that women, as well as men, play key roles in fishing communities. Women are deeply invested and actively involved in the fishing economy and culture. While there are women who fish (many of whom prefer to be called “fishermen”), most women in fishing communities work behind the scenes. Frequently, they manage the on-land aspects of the fishing business, although some join their husbands at sea. They support their families and businesses by

providing vital organizational, economic, and emotional support (Davis and Bailey 1996; Dixon et al. 1984). Women also play a unique role in helping their families adapt to economic and social change. Often, their occupational flexibility, including the ability to add and drop part-time jobs, allows them to act as economic buffers when families must adapt to financial difficulty. In a similar industry, Gilden’s (1997) work with Oregon timber families showed how women helped their families adapt to change in a comparable way. The Oregon Sea Grant Adapting to Change project is one of a growing number of efforts to expand knowledge of women’s roles in fishing communities (Smith 1995; Mederer 1996).

Gear, Local, and Species Communities

Fishing communities are sometimes defined by the fishing gear they use. A single port can harbor groups who fish a variety of gears and species. Trawlers, longliners, trollers, gillnetters, pot fishers, and divers are a few examples of gear groups. Sometimes the targeted species forms the community of interest—for example, groundfish, shrimp, crab, salmon, albacore, and sea urchins. Most of the income generated by the trawl fishery comes from the “deepwater complex” (sablefish, longspine and shortspine thornyheads, and Dover sole). Trawlers also target rockfish with midwater and bottom trawls, catch sole and other species complexes inshore, and target shrimp. Whiting, which offers the single greatest volume in the trawl fishery, is caught in midwater trawls. Trolling is used in both the salmon and albacore fisheries. For a more detailed description of the troll and trawl gear communities, see Appendix A.

Gillnetting is one way to catch salmon, shad, and sturgeon in the Columbia River. Crab pots are the primary gear for catching dungeness crab. Pots (a type of fixed gear) are used to catch sablefish (also known as blackcod); and longline gear (also a type of fixed gear) is used to catch sablefish, rockfish, other groundfish, and halibut. Other hook-and-line gears, such as vertical longline, dinglebar, and jig, are used to catch many species of groundfish.

Generally, Oregon fishing businesses are family run and each boat represents one or more fishing families. A small percentage of families own more than one boat. Although many fishing businesses became corporations in the 1970s to address liability issues and

protect personal assets, large corporate ownership of vessels on the Oregon coast is limited.

No single coastal location depends exclusively on fishing. Oregon's fishing communities are located in complex regions with diverse economies. Processing plants, buyers, gear suppliers, boat repairers, fuel docks, brokers, insurers, coffee shops, and cafes cater to fishers, and changes that affect fish and fishers also affect these businesses. Other industries are also important. Extractive industries such as forestry and farming have always been important to the coastal economy, and even tourism has a long history on the Oregon coast. Retirees, sunbirds, telecommuters, and people buying second homes are increasingly a part of the coastal community.

The importance of fishing is difficult to quantify. Although statistics give revenues by fishing community (Radtke 1992; Radtke and Davis 1998), less well understood are the number of crew members; the economic importance of processing; the numbers of small businesses that rely on fishers, the aesthetic contributions of a fishing port, and the attraction of fishing boats for tourists.

Recreational fishers (anglers) are associated with Oregon's coastal commercial fishing communities. The recreational fishing industry, which is substantial, includes charter boats, guides, marinas, and other support services. Anglers fish many of the same species that provide commercial fishers' livelihoods, and they vastly outnumber commercial fishing families. Whereas commercial fishing families number in the hundreds in any one community, the number of anglers can be in the thousands. The recreational fishery is multifaceted. The charter boat fleet and individual guides serve anglers who want a guided fishing experience. In some coastal communities, commercial charter boats serve a high volume of fishers who target rockfish, lingcod, salmon, seabass, crab, albacore, halibut, and other species. Other recreational fishers rent boats, or they own boats and berth them in or transport them to fishing communities. They catch significant amounts of crab, rockfish, and coho and chinook salmon. Anglers also fish from jetties, docks, and beaches.

Commercial and recreational fishing communities coexist, and recreational fishers contribute financially to the coastal businesses that serve them. However, as fish allocations become leaner, conflicts between the two groups are increasing.

The commercial fishing industry includes many communities of interest that cut across geographic

boundaries. Communities of interest form around occupations, activities, and political necessity. The following are just some examples of such communities:

- The *Brookings-Harbor Commercial Fishermen's Wives Association* represents the interests of fishing families on the southern Oregon coast.
- The *Columbia River Fishermen's Protective Union*, Oregon's oldest occupational fishing community, advocates the interests of lower Columbia River gillnetters. Now that gillnetting on the Columbia River has been highly restricted, it also serves gillnetters who work in Alaska and live in northeast Oregon or southwest Washington.
- The *Coos Bay Trawlers Association* represents approximately half of those responsible for the catch of the Coos Bay trawl fleet.
- The *Newport Fishermen's Wives Association* is Oregon's oldest active fishermen's wives group. It was formed in the 1970s to provide support for fishing families and to promote seafood and fishing vessel safety. Membership includes fishermen's wives and others involved with fisheries in Newport and Lincoln County.
- The *Oregon Trawl Commission* and *Oregon Dungeness Crab Commission* are industry-funded state "commodity commissions" that allow producers to tax themselves and use the proceeds to promote their commodities.
- The *Pacific City Dorymen's Association* has 147 members in Pacific City. The association is involved in negotiating groundfish management issues and is working with the state to ensure continued use of Cape Kiwanda, where dories are launched.
- The *Midwater Trawler Cooperative* represents the interests of Oregon midwater trawlers who fish locally and in Alaska. This organization has a membership of 40 vessels who contribute approximately \$44 million a year to the Oregon economy.
- The *Fishermen's Marketing Association of Eureka*, serving trawlers from Monterey to the Canadian border, has 120 members along the Oregon coast.
- The *Pacific Coast Federation of Fishermen's Associations* serves trollers from California, Oregon, and Washington.

- The *Pacific Marine Conservation Council (PMCC)* is a non-profit organization based in Eureka, California. The PMCC focuses on protecting the health and diversity of Pacific ocean and coastal resources through a multispecies, ecosystem approach to research and management. Members include coastal residents, commercial, sport and tribal fishers, and scientists.
- *Salmon for All* represents fishers, processors, gear suppliers and others involved in the lower Columbia salmon fishery. The organization recently published its plan for a sustainable lower Columbia salmon fishery based on hatchery/net pen production and terminal harvests.
- The *West Coast Fishermen's Alliance (WCFA)* has approximately 60 members from Washington to southern California, all of whom fish commercially, mainly from small vessels. The WCFA is a grassroots organization that promotes sustainable fisheries, conservation, and the viability of small coastal communities. Members longline for groundfish and target crab, salmon and tuna.
- The *Western Fishboat Owner's Association* represents approximately 550 hook-and-line albacore fishers on the West Coast and around the world.
- The *Women's Coalition for Pacific Fisheries (WCPF)* is a multigear, multifishery group that connects fishing families from Alaska to California.

Although these communities of interest transcend geographic boundaries, the Magnuson-Stevens Act uses a place-based definition of community. Oregon's coastal fishing communities are identified with ports such as Astoria, Bandon, Brookings, Charleston, Garibaldi, Depoe Bay, and Newport (for detailed descriptions, see Appendix A). Although fishing is an important activity in these "communities of place," they are not exclusively fishing communities, since they have nonfishing members and industries. Likewise, the "communities of interest" in trawling, long-lining, crabbing, trolling, and other gear and species types are not exclusively communities of interest because fishers mix species and gear.

Dynamic Communities

Fishing communities are dynamic and continually adapting to change. The drivers of long- and short-term change are the availability of fish stocks, government policies, market conditions, port infrastructure, processing availability, harbor access, environmental factors, and community support for the fishing industry.

Astoria is one example of the fluctuating fortunes of fishing communities. In the late nineteenth century, the lower Columbia River was Oregon's primary fishing area. Astoria was the center for salmon fishing and processing, but many other lower Columbia River communities housed canners and fishers (Martin 1994). At this time gillnetters were the dominant gear community, though haul seiners, fish wheelers, trapmen, and dipnetters were also found in communities along the Columbia and Snake Rivers. As time went by, Astoria's economy grew to include logging, services, agriculture, shipping, and tourism. Salmon fishing became only one of many fishing activities as trolling, trawling, crabbing, shrimping, and long-lining expanded.

Three thousand gillnetters fished the lower Columbia in the 1880s. Gillnetters provided income for their households and the industries that supported them. Many gillnetters of the 1880s lived in other cities along the Pacific coast and came to Astoria for the late spring and early summer fishing season. In some communities, full-time residents alternated between logging, farming, and seasonal gillnetting. In 1950, 1,060 gillnetters fished in the lower Columbia. This number declined during the 1960s and then grew to 1,524 in 1979 (ODFW 1998). By the 1990s, recreational sailboats had taken the place of gillnet boats in Astoria's west basin, as fishing on the Columbia was limited by endangered species concerns. In 1997, 689 Columbia River gillnet licenses were issued (ODFW 1998).

For all of Oregon's coastal commercial fishing communities, 1998 marked a major transitional period. Gillnetters, who constitute Oregon's oldest fishing community, were severely restricted in both area and catch. Increasingly, this has been the case for trollers as well. Record salmon catches during the early 1990s in Alaska and competition from pen-reared salmon have kept salmon prices down. The groundfishery is also experiencing problems. Revisions in stock assessments,

combined with a new precautionary approach to setting fishing limits, have resulted in lowered total allowable catches for groundfish. After several excellent years, both the crab and shrimp fisheries were down in 1997, mainly because of natural fluctuations in stocks. Albacore catches were high in 1998, but the downturn in the Asian economy, combined with a worldwide oversupply of albacore tuna and tuna buyers' preference for Asian-caught albacore, left West Coast fishers without major buyers for their fish.

Stock declines, management decisions, and market conditions continue to influence the health of Oregon's fishing communities. Scarcity leads to conflict between users of different gear types, and the focus on crisis management—in the fishery, the fishing business, the community, and the home—lessens participants' ability to pursue clearly defined goals and makes the future increasingly uncertain.

On a long scale, the fishing industry has changed dramatically from an open profession with few regulations and abundant freedom to a highly regulated

industry. People who were drawn to fishing's independent lifestyle—where hard work, skill, knowledge, and luck determined personal success—are having a hard time adapting to the “new” fishing industry, which is strongly influenced by regulations, politics, scarcity, economic stress, and gear conflicts. Successful professional fishers have substantial knowledge of fisheries issues, accumulated through informal experience and formal education. However, many feel their knowledge is ignored in the increasingly bureaucratic atmosphere of fisheries management.

These long-term changes will be reflected in the next generation. Cramer and Cordray (1998) found that although many Oregon fishers intended to remain in the industry, they did not want their children to plan on careers in fishing. Mothers felt fishing was too dangerous and fathers felt it had no future. Virtually all the parents interviewed were encouraging their sons and daughters to go to college or pursue training in occupations other than fishing.

Suggestions for Action

To deal with these diverse and changing fishing communities, it is important to understand how fishing families, businesses, and communities blend communities of place, gears, species, and nonfishing activities to construct their occupation. What are the patterns in this mix, and how can catches be allocated to make these mixes sustainable?

The following suggestions include research and management actions that can help fishing families and businesses make decisions about the future. These actions merge the concern for communities of place expressed in the Magnuson-Stevens Act with the communities of interest found in fisheries.

General Steps

- Focus on the activities of fishing families and businesses, which subsist by combining diverse fishing and nonfishing activities. Management's species orientation misses the complexity of activities needed to sustain fishing families, businesses, and communities.
- Focus on the organization of human communities associated with fisheries. Learn how fishing activities are structured, and seek to understand communities' economic systems and cultural values.
- Evaluate the effectiveness of fishing communities that are working toward sustainability (i.e., through industry-supported buyouts and community-based management).
- Recognize women's roles, the cultural and spiritual importance of fishing, informal support services, and other academically nontraditional factors. Fishermen's wives programs can facilitate communication between management and fishers.
- Listen and solicit feedback. People have different backgrounds and experience, and communication is vital.

Specific Steps

- Study how fishing families and businesses adapt by moving between fisheries and how the complex of fisheries can be combined to provide sustainable fisheries. Understand the mix of activities in which these groups are involved.
- Support long-term collection of quantitative and qualitative data that characterize fishing families and businesses. These data can be used to adjust catch allocations to allow a mix of fishing and nonfishing activities that enable fishing families and businesses to adjust to fluctuating conditions.
- Involve fishing community members in planning, researching, and monitoring sustainable fishing practices.
- Discuss the meaning of sustainability with fishing community members and the kind of sustainability they value.
- Communicate with the fishing community about the state of the fisheries and expectations for the future.
- Maintain current assessments of community resources to determine what social support services exist and where additional services are needed.
- Recognize fishing communities of interest by maintaining up-to-date lists of fishing interest groups, contact persons, and interest group charters. These are valuable sources of information and feedback.
- Evaluate the infrastructure of geographic communities. This embraces social services (insurance, education, safety) and physical infrastructure (ports, harbors, etc.) Identify problem areas.
- Encourage state and federal government agencies to separate fishing, timber, and agriculture in statistical summaries.

Helping Fishing Community Members Cope with Change

People in the fishing industry are adept at managing change within certain limits, but when circumstances fluctuate dramatically, they experience enormous stress. The industry's emergence into the next decade will require adjustments in everything from management strategies to personal business planning. Inevitably, these changes affect all members of fishing families and the fishing community.

Infrastructure needs are vital for fishing communities. However, resources for the people who make up the fishing community are also important. A solid base of support helps people deal with the stress and uncertainty caused by economic and social change. This support includes education, health care, financial resources, affordable housing, and assistance in times of crisis.

Fishers and their families value self-reliance. Pride in an honorable occupation is pervasive, and government handouts and welfare-style assistance are not often well received. Sometimes fishers do nothing until a crisis hits and then feel isolated, alone, and unsupported. Most fishers learn the business informally, and Cramer and Cordray (1998) found that the fishers they interviewed were unlikely to take advantage of any formal education programs other than those required to maintain or gain licenses. However, fishers do take advantage of opportunities to share information on topics like business management, taxes, regulations, and fishing gear. When available, programs need to conform to fishers' independent lifestyle, including their erratic schedules and changing locations.

Although they also value independence, fishermen's wives may be more receptive than their husbands to programs designed to help them. They are concerned with the safety and welfare of their husbands and families and may be less resistant to seeking support when it is needed. Many fishermen's wives are active in fishermen's wives organizations and other community efforts. They participate in practical educational programs and in public policy and leadership opportunities that help fishing families have a stronger voice in industry-related issues.

An organization seeking to assist fishing communities should first assess current resources to determine what support services exist and where additional services are needed. Apart from the formal programs listed below, many informal resources are available to fishing families undergoing change. People often rely on their extended families for jobs, child care, loans, and other support. Personal savings accounts are extremely important to people who work in fluctuating industries, and women's traditional ability to take on temporary or part-time jobs has helped many families weather financial crises. These informal resources can be supported by employers, banks, and other organizations that recognize their importance. For example, fishermen's wives and children are often given preference in hiring in processing plants. This work can be a major source of income for younger members of fishing families (Martin 1998, personal communication).

We have grouped into three categories community resources useful to individuals and families in the fishing industry:

1. Resources for those who intend to remain in the industry ("Staying In")
2. Resources for those who want to get out of the industry ("Getting Out")
3. Resources for those who are down and out ("Basic Survival")

Although we will discuss category 2 ("Getting Out") and category 3 ("Basic Survival"), our emphasis is on category 1 ("Staying In"). These resources enhance and support successful fishing families, businesses, and communities.

Category 1: Staying In

Many fishers and their families are committed to the fishing industry despite the challenges it presents. Continuing education, business development, family services, and occupational training can help them stay in the industry or diversify.

Education, Training, and Business Assistance

Extension Sea Grant

Extension Sea Grant (ESG) provides educational programs to help the fishing community adapt to change. These programs include industry-related workshops on vessel safety, seafood handling, financial management for fishing businesses and families, communication skills, and ways to find information and support. ESG also sponsors meetings with fishing communities and agencies on topics such as management and enforcement, proposed regulations, and new gear developments. Educational programs offered by ESG are probably the most popular of this kind of service for coastal fishing communities. Marine Extension agents are located in the ports of Astoria, Tillamook, Newport, Coos Bay, and Portland. A single agent serves Gold Beach, Brookings, and Crescent City. Fishing community members may request programs on almost any topic. As a result of requests and participation (through workshops, newsletters, etc.), ESG has a large and active mailing list of crew members, boat owners, skippers, and families throughout Oregon.

Community Colleges and Small Business Development Centers

Community colleges and small business development centers (SBDCs) offer a wide variety of services to small businesses. These services include training and education in starting and operating small businesses, financial planning, and information on grants and loans for small businesses. People who seek help from SBDCs are usually interested in diversifying their businesses through innovation, niche marketing, or value-added products. Community colleges and SBDCs are located in Astoria, Tillamook, Newport, and Coos Bay. Satellite offices are found in some smaller coastal communities. SBDC services are readily available to fishers and their families but for the most part have not been used. At present, the fishing industry is not a target audience for community colleges and SBDCs. One exception to this is Clatsop Community College's Maritime Science Department.

Clatsop Community College's Maritime Science Department

Clatsop Community College's Maritime Science Department in Astoria offers a variety of training classes for fishers—from sea safety and survival to basic navigation, seamanship, and deck skills. Information

on these classes is sent to lists of permit holders around the state, though most of the classes are conducted at their campus in Astoria. It is possible to bring some of the classes to other ports, which has been done with the vessel safety program and the license prep courses. Although this is a valuable resource, the classes are advertised only through yearly mailings to licensed boat owners in Oregon. As a result, crew members do not receive this information directly.

The Oregon Economic Development Department Business Finance Programs

The Oregon Economic Development Department offers business finance programs for creating, expanding, and retaining jobs. These loans and grants are available to those in the fishing industry who qualify, but qualifying can be difficult and available funds are limited. It would be helpful if fishing families could get more help applying for these loans through local SBDC offices.

Economic Development Programs

Some counties have lottery-funded economic development programs to enhance and encourage local small business development. Again, these programs can be difficult to qualify for, and funds are limited. And, as in other situations, it would be helpful if SBDF offices offered assistance in identifying and applying for these programs.

Business Information Center

The Business Information Center is a cooperative effort by six state agencies to offer centralized information for registration and licensing requirements for new businesses. Again, this service is for land-based businesses that fishers might establish for value-added or marketing purposes. It is not applicable to fishing vessels as a business in the traditional sense.

Family and Personal Care Assistance: Counseling Services

Financial Planning

Help with financial planning and budgeting can be difficult to locate. *Consumer Credit Counseling Services* are available in some ports at no cost to the user, but most who want to use these services must travel inland. Financial planning consultants do offer their services in some ports for a fee. The Oregon Sea Grant publication *Fishing Family Expense Tracking System* (ORESUG-98-004) can help with this issue.

Mental Health Counseling

Mental health professionals can be found in most ports. They may be available through local health departments or through the schools, although these institutions often lack the resources to help all who need them. Since many in Oregon's commercial fishing community (31 percent, or triple the state average) do not have health insurance, most do not have access to affordable private mental health counseling (OSU Fishing Families Project 1998). This is especially important in times of crisis (vessel sinking, death, and divorce) and in times of economic downturns in the industry. The Oregon Sea Grant publication *Seeking Professional Help with Emotional Stress and Strain* (ORESUS-97-005) addresses this issue.

The Oregon Psychological Association has referral services for those professionals who are willing to negotiate their fees. Some churches also provide pastoral mental health counseling on a sliding fee scale.

Medical Assistance

There is no group health care plan for the fishing community. As a result, most fishers and their families go without health insurance, have health insurance through the spouse's job, or buy it on their own. Health insurance is expensive, and fishers who pay for it themselves are often under-insured. Some qualify for the Oregon Health Plan, but since this is tied to income, it is not suitable for most people in the fishing community. For those without health insurance who cannot afford to go to a doctor, local health departments in some communities offer basic services like immunizations, sports physicals, and birth control.

Help from Schools

School districts generally offer a variety of services to families through their students. These services include family counseling, some health care, crisis prevention and intervention, and parenting education.

Legal Assistance

For those seeking counseling on legal issues, there are many attorneys on the coast. Free services include Oregon Legal Services, Tel-Law, and the Attorney Information Network.

Category 2: Getting Out

Some people thrive on change. For them, adjusting business practices and home life is not a problem. But for others, change and the subsequent periods of

transition are filled with stress, uncertainty, distrust, and anger. Some fishers feel there is no future in the industry and are leaving altogether. Among other things, this has led to a lack of qualified crew for vessels.

For those who want to leave the commercial fishing industry, limited services are available in coastal ports. Oregon's coastal communities are small and do not have the financial resources to offer the broad array of services or income opportunities found in larger metropolitan areas. Fishers seeking a new job, retraining, or skills assessment can contact state employment offices or offices established by the Federal Job Training Partnership Act.

State Employment Offices

State employment offices are located in all major ports and offer job referrals, career planning programs, resume-writing assistance, reemployment services, and child care programs. Often, however, these offices are not prepared to deal with crises such as those found in fisheries.

Federal Job Training Partnership Act

Service providers of the Federal Job Training Partnership Act have offices in Astoria, Tillamook, Newport, and Coos Bay. These offices offer training opportunities to dislocated workers, and sometimes their spouses, so they can obtain employment in other occupations. While there is no cost to qualified applicants for the training, most people in fishing communities need to support their families during the transition period, making these services difficult to use.

Category 3: Basic Survival

For those who are down and out for whatever reason, limited resources are available in most coastal communities.

Adult and Family Services

Adult and Family Services is a state agency offering a broad array of support services, from subsidized housing and day care to health care, cash assistance, and food stamps.

Religious Organizations

Churches in fishing communities sometimes run food and clothing banks, offer pastoral counseling and grief counseling services, and provide low-cost child

care. Some churches specifically cater to fishing families (Martin 1998, personal communication).

Crisis Groups

Crisis services such as drug and alcohol rehabilitation and women's centers are also available in some coastal communities. These services quickly become overwhelmed during a community crisis.

While the community resources mentioned above are often available to families in larger ports, most people living in smaller ports must be willing and able to travel. Also, most of these services are limited and are often in need of funding. Usually they are not designed to suit the unique needs of fishing families; therefore, most are not widely used by the fishing community.

People in the fishing industry need timely, regular information in order to plan for the future. A lack of information exacerbates the stress that many fishing families feel. If they choose to leave the fishing industry, they must do so before they hit bottom and are left without resources, financial or otherwise. This is why it is so important to communicate with the fishing community about the state of the fisheries and expectations for the future—even four, five, or more years down the road. Fishers need complete information to make well-informed decisions. For example, if they are told of a new research project to study groundfish stocks, they should also be told when conclusions will be drawn, even if the process will take four years.

Learning must take place—on both sides—about the needs of the community and the resources available to meet them, and ways to make those resources better serve all involved. Communication is needed in all areas. The commercial fishing industry could clarify its needs by educating the larger community and management. Assistance agencies also need to communicate among themselves and make sure that their messages are being heard by those who need assistance. For example, fishermen may not be aware of existing programs to help them move out of the industry or diversify while remaining within it.

Some efforts to improve communication are underway. Oregon Sea Grant and the Women's Coalition for Pacific Fisheries recently developed a new Web-based information service, *Heads Up!*, which provides timely information on industry, safety, family, and seafood issues to commercial fishers and their families (www.heads-up.net). Although this and other Internet-based services provide timely and relevant information, many people in fishing communities do not have personal access to the Internet.

Lessons learned during the farm crisis and other natural resource crises offer valuable insights into community change in other industries and underscore the need for timely information. The farmers' comments below also apply to members of fishing communities.

I wish I hadn't just let things happen to me like I did. I didn't know anything about what I should do and so I just took things as they came. Now I regret some of the decisions I made. Declaring bankruptcy's one. That is hanging over me like a black cloud, and I am stuck with it.

My advice to anyone going out of farming is simple. Seek every avenue and every available option. Talk to anyone and get their opinion. It takes time and it isn't easy talking about your problems, but believe me, it is worth it. You'll be prepared for a lot of things that will happen and you'll also be in a better position to make the right decisions for your family. You'll stay in control of your life.

We lost everything we had—22 years down the drain. We were stupid to wait so long. All that work, all that love, and all our dreams are gone. We came out with absolutely nothing. We had to declare bankruptcy, which makes starting over very difficult. (Graham and Brake, 1993).

Developing Data

Although researchers have conducted studies of Oregon fishing communities at various times, there is little systematic information about these communities. This is partly because fishing communities fall into many different statistical categories. Statistics are weakest for unincorporated locations, for which only basic demographic data are usually available. Census and county data typically combine forestry, fishing, and farming in one category. The National Environmental Policy Act requires agencies to assess impacts of regulatory actions on the human environment, and although environmental impact assessments have been prepared, research on fishing community issues is very limited.

The number of fishers is hard to determine for many reasons. First, fishing can be one of several activities that provide household income. It may be combined with logging, farming, teaching, construction, or other occupations. Second, although the number of boats, permits, and licenses is available from the Oregon Department of Fish and Wildlife and PacFIN data, these numbers do not tell the whole story. Some people have multiple permits or licenses in a state; their names may be spelled differently for different permits or licenses; or their initials may be used in one case and their names spelled out in another. When using the same name, they may have multiple addresses. Although a coastwide estimate of the number of fishers would be useful, people who live in one state may have permits or licenses in other states. In addition, permits or licenses are continuously being renewed, so the pool is constantly changing. The issue is further complicated when people use other people's boats and permits. To establish the number of fishers, then, is a complex task that has never been satisfactorily completed. Even after assessing the number of fishers, it would be helpful to know the number of individuals, households, and household members and the percent of individual or household income from fishing. These data are unavailable except when surveys have asked these questions.

While some information on vessel owners and captains is available, much less is known about crew members. Salmon trollers often have no crew, and if

there is a crew member it is frequently a spouse or relative. Trawlers typically have two or three crew members, and larger boats have more crew. Some boats fish in Alaska, which means they may have a mix of Alaskan, Oregonian, and other crew members. Because of the uncertainty in the industry, quality crew members are difficult to find. Many applicants for crew jobs are itinerant workers with limited skills, and often they have financial and other problems that make them less than ideal employees (Fisher 1998, personal communication).

The Use of Fishing Community Data in Fishery Management

Fisheries management has traditionally focused on biological data relating to the status of fish stocks. Now the Magnuson-Stevens Act calls for managers to account for the effects of their actions on communities, to avoid "adverse" effects on communities, and to encourage "sustained participation" in the fisheries. This signals an important shift in perspective, both personally and in research. The social and biological sciences represent different academic cultures with different traditions, languages, and values.

Often, the first step in social research is to listen in order to determine what questions to ask next. As Janet Fitchen writes (1990), "How do you know what to ask if you haven't listened first?" The researcher must identify qualitative categories (such as types of fishing or types of people involved in fishing) before moving on to quantitative analysis. Methods such as participant-observation, interviews, and analysis of historical documents and statistical data are used before proceeding with a quantitative study.

The following approaches are useful when trying to understand any community:

- active listening (spending time with subjects; listening to their views on issues that may seem irrelevant to the study, but which are relevant to them; listening without judging)
- sacrificing preconceived ideas and respecting differences

- avoiding jargon (avoiding unnecessary acronyms; explaining concepts that are not familiar to people outside a given discipline)

A summary of major social science methods follows. The first and easiest method is to hire someone who already has experience in conducting surveys and interviews, measuring attitudes and values, and learning what makes communities work. The “human dimensions of natural resources” field is attracting increasing numbers of students who are eager to apply their knowledge of environmental and social issues. They include social scientists who are familiar with fisheries issues, and fisheries students who have been educated in the social sciences.

Following are the major methods used in the social science.

Ethnography

Ethnography is the traditional method used in cultural anthropology. It is an inductive, dialectical process in which the researcher forms and refines hypotheses as data are gathered, rather than predefining them. Ethnography aims at understanding a culture from the perspective of its participants and accepting the participants’ perspective as intrinsically valid. Ethnographic methods include participant observation (spending time with the subjects as they go about their daily lives or participate in certain activities); interviews (described in detail below); and learning about the community in other ways, such as attending public events, reading newspapers, and studying cultural symbols (Fitchen 1990; Agar 1980).

Interviews

Research interviews can take many forms. Structured interviews may be based on a list of questions that are asked of every subject, where deviation from the questions is not included in the final data collection. Unstructured interviews may be rambling talks covering a variety of the subject’s concerns and views. Interviews may be done on an individual basis, or with formal or informal focus groups. They may be done door-to-door, over the telephone, in coffee shops, or in labs. The type of interview depends on the type of data the researcher is gathering; for example, an early ethnographic study exploring community concerns might use unstructured individual interviews, whereas a study of peoples’ views on port developments might use door-to-door, structured interviews.

Surveys

Surveys also take many forms. Sample selection is important for both interviews and surveys, and has an effect on what kind of survey or interview process will be conducted. Large, representative samples or censuses (where the entire population is sampled) might use mail surveys, which are usually faster and less expensive than other types of surveys. Like interviews, surveys may be formal or informal and may use a variety of methods. Major types include mail surveys (sometimes involving three or more separate mailings to the survey group), door-to-door surveys, and telephone surveys. The type of survey is limited only by the creativity of the surveyor; however, each survey method has its inherent benefits and drawbacks. For example, telephone surveys do not work well in rural areas where many people don’t have telephones.

Documentary Research

Documentary research involves analyzing existing documents such as historical records, oral histories, local newspapers, organizational documents, strengths/weaknesses/opportunities/threats (SWOT) analyses, economic development committee minutes, and local phone books. It also involves using secondary data such as census data and other federal and state statistics.

Content Analysis

The content of meeting minutes, newspapers, magazines, and other documents can be analyzed to determine what, how, and how often given concerns or topics are raised. The content of oral interviews, tape recordings of meetings, and other recordings may also be analyzed.

Literature Reviews

Common to many disciplines, doing a literature review simply involves learning from the research that has already been conducted in the field.

This listing of methods is very general, focusing on major research methods used to study communities and cultures. It does not cover such topics as research validity, theory, and tools (such as Geographic Information Systems, statistical packages, and software for analyses of ethnographic research). The scope of research methods is very wide, ranging from informal dockside conversations to highly sophisticated statistical analyses. Likewise, a wide range of information can be considered relevant to fishing communities. Limits on

data availability and research funding mean that only the data most pertinent to typical fishery management decisions will be chosen. These data, once defined as baseline community data, can then be standardized and collected over time.

Fisheries data have focused on species and gear, rather than on captains, crew, families, households, and ratios of income from different activities. A long-term, systematic focus on fishing businesses and families, using quantitative and qualitative data gathered according to categories relevant to fishing communities, would be useful for future work with fishing communities.

Meeting the Magnuson-Stevens Act's requirements will require more than expanding data on fishing communities, however. How these data are analyzed and presented must also be determined. Some guidance can be found in existing documents on doing social impact assessments for fishery management plans (Fricke 1985a, 1985b, 1994). These guidelines are a helpful beginning for community analysis but do not

address the full range of considerations under the Magnuson-Stevens Act. Some attention must be given to developing a standard framework for community analyses whose use for fishery management decisions becomes routine. Fishery managers will also need to understand how to use those data to assess the "adverse economic impacts" of various regulations to communities, as well as the effects of their decisions on the "sustained participation" of communities.

Because the act recognizes the dynamic nature of fishing communities and fisheries, managers have great flexibility in how they assess and account for community effects. This flexibility, and the fact that community considerations are new and broader concerns than are typically part of the assessment of regulatory actions, means managers will need guidance on how to effectively use the data that are generated. Social scientists can provide managers with appropriate methodology and help with interpreting analytical results.

Appendices

Appendix A: Trolling and Trawling

To illustrate the complexity of communities, we will compare two of Oregon's major gear communities—trolling and trawling. We use different time periods because specific questions about these fisheries generated data about them at different times. Data describing the complex of fishing activities engaged in by trollers and trawlers have not been a research priority but would provide a more complete picture.

For this study we start after World War II, a time of expanding resource exploitation in fishing, forestry, and farming. After World War II, trolling for salmon developed as a full-time occupation, and several thousand trollers fished for salmon from the Oregon coast (figure 1) (Radtke and Jensen 1988; Taylor 1996). The boats were typically around 30 feet. Each represented a family business. Many fishers made trolling their full-time occupation, but a large number were part-timers who took advantage of salmon's summer peak to earn extra income. In later years, salmon increasingly became a part-time fishery for professional trollers, who supplemented it with albacore and crab or other species. Because of declines in stocks of coho salmon, many trollers have moved into different fisheries or have quit fishing altogether.

Trawling developed in the 1930s (Stephenson 1980; Harman 1988; Goblirsch 1997) and is a full-time occupation. Four communities—Brookings/Harbor, Charleston/Coos Bay, Newport, and Astoria—accommodate most of the trawlers on the Oregon coast. Trawl boats are generally two to three times the length of trollers and number in the hundreds.

The joint-venture trawl fishery, in which U.S. catcher boats delivered to foreign processing ships, developed in the late 1970s. The revenue from these vessels was a significant source of income for local communities. However, distant-water fisheries also introduced new social problems: fishers spent months away from their families, and some crew, finding themselves with large paychecks when they reached port, spent their money unwisely so they had nothing left for taxes. These problems continue today and are felt by the entire fleet (Goblirsch 1998, personal communication).

Both trolling and trawling are characterized by their flexibility. Both can target various species and change their target species depending on market opportunities and other factors. For example, trawlers may switch from groundfish to shrimp, from shrimp to crab, or from groundfish to crab. Full-time troll fishers make their living by pursuing a combination of albacore, crab, salmon, and other species. They may also long-line and fish with pots. This flexibility allows trollers and trawlers to survive as businesses in dramatically changing circumstances.

Fishers' flexibility includes inventiveness. In the unprotected harbor at Port Orford, fishers created a system for hoisting trollers onto the dock to protect them from Pacific storms. In the 1990s this fleet shifted from trolling to long-lining. In Pacific City, fishers adopted and adapted flat-bottom dories that are trucked to the beach and launched directly into the surf.

The following sketches give a sense of the communities associated with the troll and trawl fisheries.

Trolling, 1994

Salmon trollers fish from small boats located in ports along the northern California, Oregon, and Washington coasts (figure 1). The area has low population density and small communities that gird the mouths of rivers and coastal estuaries. The largest town, Eureka, with 12,000 households in 1990, bounds the small streams entering Humboldt Bay. In Oregon the largest communities, from south to north, are Brookings, at the mouth of the Chetco River; Coos Bay (including Charleston and North Bend), at the mouth of the Coos River; Reedsport, at the Smith and Umpqua Rivers; Newport, at the mouth of the Yaquina River; and Tillamook, at the Trask and Wilson Rivers. The lower Columbia River is home to many Oregon and Washington fishing ports, including Astoria and several communities bordering Gray's Harbor in Washington. Aberdeen, Washington's largest coastal community, surrounds the entrance of the Chehalis River into Grays Harbor.

Since trollers fish in the ocean, one would expect their communities to be close to the ocean. Using ODFW data for troll permit holders in 1994, we found this was true of the three communities with the highest percent of fishing households—Pacific City, Port Orford, and Charleston. In 1994, 10 percent of the local households in these communities had troll permits. Next closest, with 3–6 percent of the total households being trollers, are the ports—Bandon, Depoe Bay, Garibaldi-Rockaway Beach, and Brookings-Harbor. Interestingly, Crescent City in northern California has a high percentage of Oregon troll permits (3 percent of the households). Because of regulations in the Klamath Management Zone, trollers from Crescent City cannot fish Klamath River chinook in the area north and south of their port (from Humbug Mountain, Oregon, to Horse Mountain, California). Therefore, Oregon is one of their closest fishing areas and many have purchased Oregon troll permits. A 1996 survey of Oregon troll permit holders that measured the fishers' responses to the 1994 coho closure found that almost three-fourths (73 percent) of respondents gave Oregon as their place of residence. Eighteen percent reported Washington and 6 percent were Californians (Gilden and Smith 1996).

Only just over a third of Oregon's trollers, however, reside in any of the coastal salmon fishing ports. While the largest concentration of Oregon trollers resides in the Charleston, Coos Bay, North Bend area (11 percent), almost 5 percent come from Eugene-Springfield, which is 60 miles inland from the coast. Trollers come from Alaska, North Carolina, and all western states.

Another way to look at troll fishing communities is to see how trollers view their involvement in fishing. Previous studies (Smith 1981; Gilden and Smith 1996) show they group themselves as professional fishers, part-timers who combine nonfishing jobs with trolling in their annual employment pattern, and retirees who take up trolling as an activity and a source of income. These are occupational communities within the population of trollers.

Severe declines in salmon fishing opportunities in the 1990s most affected the part-time and retired trollers. In 1994, trolling for coho salmon was closed. Since coho are fished closer to shore and nearer the surface than chinook, the other major target of the troll fishery, they were fished more by part-timers and retirees. Many part-timers and retirees gave up their troll permits because they could not fish.

The more successful professional trollers participated in several fisheries, rather than concentrating on salmon (Gilden and Smith 1996). Professional salmon trollers commonly troll for albacore tuna, pot fish for crab, and long-line for rockfish and sablefish. Some are successful at marketing their catches to consumers and searching out and developing niche markets for fillets and loins and for smoked, whole, canned, and live fish (Goblirsch 1998, personal communication).

Trawling, 1976–1985

Originally, the Magnuson Act was written to secure full domestic use of fisheries in U.S. territorial waters. From 1976 to 1985, the process called the "Americanization" of the fishery removed international fishing efforts by Russian, Japanese, Taiwanese, Korean, East German, and Polish factory trawlers. As a result of the full-domestication policy and its incentives for vessel construction, the trawl fleet grew, catches increased, and processing capacity in coastal communities expanded. Federal financing programs, tax incentives, new fishing techniques, and the targeting of previously unused species augmented growth in the trawl fleet. In the late 1970s, midwater trawling allowed fishers to catch schooled populations of widow rockfish and several other rockfish species that were well off the ocean bottom. As part of joint ventures, West Coast catcher boats delivered at sea, generally to Russian factory processors. Later, U.S. at-sea processors and catcher-processors entered the fishery, and shore-based processing expanded to take control of the groundfish fisheries.

Joint ventures were phased out by 1991 (PFMC 1998b). Now catcher boats in the whiting fishery deliver to American offshore processors. However, the largest share of whiting is processed onshore. After 1980, groundfish took over from salmon as the biggest contributor to the Oregon fishing economy.

During the 1980s the trawl fleet contributed a solid base of income to some of Oregon's largest fishing communities. Until 1996 income remained generally stable in this fishery, despite reduced quotas, because of the higher price paid for many species of fish (lingcod, sablefish, and rockfish) that were landed. While other fisheries have struggled through highs and lows, the trawl fleet has helped ensure the economic viability of support services such as processing plants, gear stores, and ports, which benefit all gear types. Processing plants depend on the volume of fish landed by trawlers,

and significant reductions in groundfish landings will likely lead to plant closures and reductions in other infrastructure support services (Goblirsch 1998, personal communication).

Trawlers are difficult to characterize because they fish so many different species and change their target species frequently. For example, trawlers may have a primary fishery, such as groundfish, but also target shrimp and crab; and they may be primarily a shrimper that also trawls for groundfish. Combinations of gear depend on changing fishery conditions.

The capacity of groundfish trawlers more than tripled between 1976 and 1980 as the fishery moved to full domestic utilization. Federal financing programs, which in some cases were offered against the advice of experienced fishers, contributed to growth in the industry. An increase in the number of vessels accounted for 55 percent of the capacity growth, but average vessel size also increased. In 1976, Oregon had 76 trawlers fishing; this number more than doubled to 186 in 1982 (Smith and Hanna 1990). In 1979 and 1980, inflation rates were the highest since the end of World War II, and in the early 1980s, the most depressed economic conditions since the Great Depression made debt service very difficult for those who had taken out loans during the 1979–80 inflationary period. In the early 1980s the trawl fishery experienced a major correction. Also, processor-imposed trip limits in 1983 and 1984 constrained larger producers, who then turned to Alaska. By 1985 the number of Oregon trawlers had declined to 133 (Smith and Hanna 1990). Some quit fishing, but many tried other fisheries or moved to Alaska or elsewhere.

The number of trawlers fishing fluctuates considerably. Between 1976 and 1985, 360 different vessels made trawl landings in Oregon, but only 25 fished all 10 years (Smith and Hanna 1990). This changing number of boats means variations in the number of

crew members, and it affects the incomes of families and community support businesses as well.

Astoria, Newport, and Charleston were the major Oregon trawl ports during the 1976–85 period. Each community had a different personality, giving an indication of the diversity of fishing communities in Oregon (Stephenson 1980; Smith and Hanna 1993). In 1985, Astoria trawlers were the most specialized and traditional of the three ports. They were more influenced by weather conditions, particularly when crossing the dangerous Columbia River bar. Newport had the largest number of trawlers. Newport trawlers were innovative and competitive, and they fished more days than trawlers in other communities. Charleston had the smallest trawl fleet, but it was the most diverse in its combination of trawl-fishing activities and it was least affected by weather conditions.

Trawlers have had to adapt to considerable variability (Hanna and Smith 1993). In 1998, severe catch restrictions hit the trawl fishery, including 30–50 percent declines in allowable catches for some species. The communities in which trawlers live have also reflected changes in the industry and wider economic and social changes.

Trolling and trawling are only two ways to divide Oregon's fishing communities. Other communities of interest include gillnetting; fishing albacore, shrimp, whiting, and halibut; crabbing; long-lining for sablefish and other groundfish; pot fishing for sablefish; and diving for sea urchins. Some communities are very short lived, like the one involved in the 1981 scallop boom off Coos Bay.

It is important to note that few fishing families, and no fishing communities, depend solely on trolling, trawling, or other single-gear types. Nearly every fishing business participates in multiple activities. To work toward sustainable fishing communities, we need to thoroughly understand this complex of activities.

Appendix B: Oregon's Coastal Fishing Communities

Since the first settlers arrived, the Oregon coast has undergone tremendous environmental, social, and economic change, and coastal communities have had little control over the processes that have shaped them. Natural forces constantly alter the coastal landscape, both through gradual geologic processes and sudden, climactic storms. Exotic plant and animal species like European beachgrass, east coast shad, striped bass, and green crab dramatically affect coastal geomorphology, flora, and fauna. And the natural resource-based economies that are so important to coastal communities are affected by external influences such as global markets, interest rates, and export-import policies. Although these factors are outside the control of local communities, other factors are within their control.

Just as individuals choose whether or not to remain in the fishery, communities determine how much support they will give to particular industries and resource uses. Lands may be used to develop new parks, fishery facilities, wildlife refuges, or gated communities. Funds may be used for port improvements, tourism promotion, social services, or any number of other projects. Some coastal communities have chosen to put resources into developing tourism at the expense of commercial fishing (Cramer and Cordray 1998), while others are increasingly focusing on the recreational fishing industry.

Infrastructure needs such as dredging, processing plants, shipyards, gear stores, cold storage, fresh water, and transportation to markets are all important for healthy fishing communities. In Brookings, Garibaldi, and other ports, lack of dredging has restricted access for fishing boats and others. In Garibaldi, the port is unsuitable for larger vessels such as trawlers. Improving the infrastructure in these ports would make them far more productive.

Changes within the fishing industry are taking place within a larger shift from natural resources to service industries. From 1977, when the Magnuson Fisheries Conservation and Management Act was implemented, to 1997, salmon's dominant economic position has given way to groundfish. Since 1988, salmon troll and gillnet revenues have declined over 90

percent. In the 1970s, salmon produced 35 percent of the revenues in Oregon's commercial fisheries. In the 1990s, groundfish produced 40 percent. The average ex-vessel value of Oregon's commercial fisheries, when corrected for the effects of inflation, has been just under \$90 million per year. The highest value (in 1997\$) was \$136 million in 1979, and the lowest was \$50 million in 1984 (C. Carter 1998, personal communication).

The major Oregon coastal fishing communities are described below (see also table 1). These descriptions are meant to give a sense of the complexity and character of these communities. Further information can be found in Appendix C. Unless otherwise noted, this section's data on the economic contribution of fisheries come from Radtke and Davis (1997), which shows the losses that coastal communities would face as a result of reduction in groundfish catches proposed by the Pacific Fishery Management Council (PFMC). The PFMC is the regional fishery management council responsible for managing fisheries in U.S. territorial waters and salmon throughout their range. Ex-vessel values are provided by the Oregon Department of Fish and Wildlife, and income, population, employment, and municipal facility information comes from the Oregon Department of Economic Development (1998). Port data come from Radtke and Davis (1997). Information on seafood processors is compiled from 1998 U.S. West *Yellow Pages*, Oregon Trawl Commission, Oregon Dungeness Crab Commission, and West Coast Seafood Processors Association listings. Unfortunately, it is difficult to determine the value of processing in each community or the number of employees at each processor. Many processing jobs are temporary and are dependent on seasons and market influences.

From south to north, the ports of Charleston, Newport, and Astoria represent the traditional south, central, and north coast fishing regions. Charleston, Newport, and Astoria have long fishing histories, major port investments, and bars that can be crossed year around. They support the full array of Oregon's fisheries.

After the major fishing ports come two intermediate ports—Brookings-Harbor and Garibaldi. These

City	Brookings	Gold Beach	Port Orford	Bandon	Charleston/ CoosBay/ North Bend	Winchester Bay/ Reedsport	Florence	Newport	Depoe Bay	Pacific City	Garibaldi	Astoria area
Population, 1997*	5,440	2,160	1,065	2,790	61,400 (Coos County)	Winchester Bay unincor- porated; Reedsport 4,835	6,570	9,960	Unincor- porated	Unincor- porated	980	10,110
Median household income (% of state median, 1990)*	88%	78%	66%	65%	79% (Coos Bay)	Reedsport 91%	70%	88% (Lincoln County)	N/A	N/A	70%	90%
1997 ex-vessel value of landings—all fish**	\$6.1 million	\$107,000	\$2.7 million	\$28,000	\$12.1 million	\$1.04 million	\$802,000	\$20.9 million	\$181,000	\$61,000	\$1.5 million	\$22.4 million
Major species landed**	Groundfish Shrimp Crab Albacore	Sea urchins Crab Groundfish	Sablefish Crab Sea urchins	Chinook Albacore Crab Rockfish	Groundfish Shrimp Crab	Crab Groundfish Albacore	Crab Groundfish Chinook	Groundfish Crab Albacore Shrimp Chinook	Crab Groundfish Sea urchins	Groundfish Crab Chinook	Shrimp Groundfish Albacore Chinook	Groundfish Crab Albacore Shrimp
Port channel depth	14'	13'	16'	13'	47'	26'	18'	40'	6- 8'	N/A	18'	48- 55'
Personal income contribution from all commercial fishing 1997***	\$14.6 million (incl. Gold Beach and Port Orford)	See Brookings	See Brookings	See Coos Bay	\$28.4 million (incl. Florence, Reedsport, and Bandon)	See Coos Bay	See Coos Bay	\$92.7 million (incl. Depoe Bay)	See Newport	\$4.1 million (Tillamook area, incl. Garibaldi)	See Pacific City	\$68.4 million
Personal income contribution of distant water fleet (Oregon fleet fishing in Alaska, elsewhere), 1997***	\$0.9 million (incl Gold Beach and Port Orford)	See Brookings	See Brookings	See Coos Bay	\$5.5 million (incl Florence, Reedsport, and Bandon)	See Coos Bay	See Coos Bay	\$55.4 million (incl. Depoe Bay)	See Newport	\$2.2 million (Tillamook area, incl. Garibaldi)	See Pacific City	\$16.5 million (lower Columbia)
Processing\$	Buying station	Small processor; live fish exporter	Buying station; small processors	Two buying stations; one processor	Many large processors	One small processor; local markets	One small processor; local markets	Many large processors	One specially processor; local markets	Independent commercial buyer; local markets	Several medium-sized processors	Many large processors

Table 1. Community summaries

*From Oregon Department of Economic Development Community Summaries, 1998

**From information provided by Chris Carter, ODFW, 1998

*** Radtke and Davis 1998

\$ Summarized from 1998 U.S. West Yellow Pages, Oregon Trawl Commission, Oregon Dungeness Crab Commission, and West Coast Seafood Processors Association listings.

ports support most fishing activities, but their histories are shorter than those of Charleston, Newport, and Astoria, and Garibaldi's bar is difficult to cross in bad weather. The rest of the ports developed primarily for salmon fishing after World War II. Their bars are treacherous in the winter, and they do not have the range of services offered in the larger ports.

Brookings

Brookings is the southernmost city on the Oregon coast. It was incorporated in 1851 at the mouth of the Chetco River, just north of the California border. In keeping with its proximity to California, it enjoys some of the coast's mildest weather, which draws vacationers and retirees.

Like many Oregon coast communities, Brookings has seen its population fluctuate. The town experienced rapid growth after World War II as people moved to the area to work in the expanding timber products industry. When mills closed in the 1960s, the population declined. Since the 1970s, Brookings has been a popular retirement spot. From 1990 to 1997, Brookings grew 23.6 percent, to 5,440 residents.

Some of Brookings' growth can be traced to the opening of a state prison in Del Norte County, California. Most of the population growth during the past decade has occurred in unincorporated areas, much of it in the Harbor area south of Brookings.

Agriculture—primarily small fruit, berries, and specialty products such as cranberries—is important to Curry County. Curry County and Del Norte County together grow 90 percent of the world's lily bulbs. Brookings' largest employer and manufacturer is the South Coast Lumber Company, with 450 employees. The second largest manufacturer is Eureka Fisheries, with 40 employees. In 1990, median household income was 88 percent of the state average.

Brookings has one high school and a public library. It houses a branch of Southwestern Oregon Community College, which offers workforce training programs. The nearest hospital is 25 miles away in Gold Beach. There is no public transportation in Brookings.

Salmon fishing used to be a mainstay of the Brookings economy. However, sport and commercial



Brookings, 1989

ocean fishing have been restricted during the 1990s to return more chinook to the Klamath River in northern California. Shrimp, crab, and albacore, as well as miscellaneous finfish and shellfish, are now important to the Brookings fishing economy. In 1997, fishermen landed approximately \$6.1 million worth of fish into Brookings. Groundfish accounted for \$1.9 million, while shrimp accounted for \$2.2 million and crab \$1.8 million. Brookings has several small fish wholesalers and processors that deal in groundfish, shrimp, salmon, albacore, and crab. Eureka Fisheries, one of the coast's major fish processors, operates a buying station in Harbor.

In 1997 the estimated economic contribution of fishing to Brookings was \$14.6 million, which was projected to decline to \$13.9 million for 1998 (Radtke and Davis 1997, 1998). Cuts in groundfish quotas are projected to cost Brookings the equivalent of 67 jobs and the loss of the equivalent of 15 vessels.

Brookings is home to an active Fishermen's Wives group that promotes and supports the industry. The Port of Brookings, with a budget of \$889,000, offers a variety of support services for recreational and commercial fishing. Brookings' harbor has a shallow mouth with a 14-foot entrance.

The Oregon Employment Department (1998) expects jobs to increase on the south coast by 12 percent by 2006. Employment gains are expected in trade and services, which accounted for 68 percent of the net change in total nonmanufacturing employment. However, the Oregon Employment Department projects continued reductions in employment in wood

products and other natural resource-based industries, which tend to pay more than tourist and service-based industries.

Gold Beach

By 1853, a thousand miners were said to be sifting through the sand at Gold Beach, trying to wash the gold from the sand at the mouth of the Rogue River. The gold gave Gold Beach its name, but it was silver salmon that sustained the small community when the gold was exhausted. In 1877, R.D. Hume opened Oregon's first salmon cannery at the mouth of the Rogue. Hume also built a hatchery that released 100,000 fry during its first year of operation. Hume named Wedderburn, on the north side of the Rogue, after his ancestral home in Scotland (Dodds 1959).

By 1895, mail boats began providing postal service from Gold Beach to isolated settlers up the Rogue River. The tradition continues today, with jet boats ferrying passengers on trips to the Rogue River canyon. Jet boat trips up the Rogue draw a significant number of visitors to Gold Beach each year.

Gold Beach has seen major growth during the 1990s. The population grew 39.7 percent between 1990 and 1997 to 2,160. The majority of growth came from a decision to annex a residential area into the city in 1995. Gold Beach is the county seat for Curry County. Its median household income in 1990 was \$21,337, 78 percent of the state average.

Curry County is the largest employer in Gold Beach. Other large employers are located in Brookings, 25 miles away. Commercial fishing and sportfishing, recreation, lumber, manufacturing, and tourism are the principal industries in Curry County.

Gold Beach has one high school and a public library. Workforce training programs are available at the Southwestern Business Development Center and through local apprenticeship programs. A 24-bed hospital in Gold Beach serves Curry County. Gold Beach has no public transportation system.

The Port of Gold Beach manages a variety of activities that support recreational and commercial fishing, as well as a small airport. The port's operating budget is \$325,000. The harbor entrance is shallow, at 13 feet. A major concern for all Oregon ports is that as fishing tonnage drops, there is less justification for dredging, which is required to keep most of the ports safe for commerce. However, dredging decisions are also affected by the volume of nonfishing ship and barge traffic.

Salmon was important historically to the Gold Beach economy, but ocean fishing has been restricted to return more chinook salmon to the Klamath River in California. This has meant reduced sportfishing opportunities and smaller commercial catches for Gold Beach fishers.

Gold Beach has a small fishing economy, which accounted for \$107,000 worth of fish landed in 1997. The community's fishers concentrate on sea urchins (with an ex-vessel value of \$43,000 in 1997), crab (\$30,000), and groundfish (\$27,000). Fisherman Direct Seafoods processes, wholesales, and retails hook-and-line-caught fish in Gold Beach, including rockfish, lingcod, albacore, chinook salmon, and crab. Norcal exports live fish from Gold Beach to San Francisco. The live fish market is a new market niche for small-boat, fixed-gear vessels and is growing in several small south coast ports.

The cuts in the 1998 groundfish quotas were not expected to have a substantial impact on Gold Beach. However, a reduction in lingcod stocks threatens Gold Beach hook-and-line fishers.

Port Orford

Coastal Indians used the sandy flats south of the Elk River as a summer camp. Europeans moved into the area when Captain William Tichenor, on a voyage from San Francisco to the Columbia River, was looking for a port to service new mining communities like Jacksonville in southern Oregon. In 1851, he brought nine men to the river mouth to start the colony that eventually became Port Orford. The new settlers were soon battling with local Indians for control of the area. Settlers built a trading post, which was used as an Army base during the Rogue Indian Wars; the wars ended in 1856 when the government shipped hundreds of natives to the Siletz Indian Reservation.

Many south coast communities, like Gold Beach and Bandon, have seen substantial growth during the last decade. Port Orford has not. The town's population in 1997 was 1,065, only 3.9 percent more than in 1990. Median household income in 1990 was 66 percent of the state average.

The largest manufacturer and employer in Port Orford is Premium Pacific Seafood, which has 65 employees and processes sea urchins. Of the 349 employed people in Port Orford, 27 percent work in retail; 23 percent in agriculture, forestry, and fisheries; and 9 percent in personal services.

Port Orford has one high school and a public library. There are no formal workforce training opportunities in the town, and the nearest community college is 61 miles away, in Grants Pass. The nearest hospital is 27 miles away. Port Orford does have a limited public transportation system.

Because of the area's geography and weather conditions, Port Orford's fishing facilities are unique. The town is a few miles from Cape Blanco, the westernmost point in the continental United States. Its fishers cope with the often severe weather by hauling boats out of the water to a dry dock facility operated by the Port of Port Orford.

The Port of Port Orford has an operating budget of \$310,000. The shallow-draft port has an inside depth of 16 feet. The port operates a variety of recreational and commercial services, including the boat hoist.

The fishing industry contributed \$5.5 million in personal income to Port Orford's economy in 1997. This contribution was expected to decline to \$4.5 million in 1998, primarily because of reductions in groundfish quotas. Port Orford has a small-vessel, fixed-gear fishery that relies heavily on groundfish. Allocation of groundfish between fixed-gear vessels and larger trawlers is controversial, particularly as ports with small boats try to survive without the salmon fishery.

Port Orford fishers caught \$2.7 million worth of fish in 1997. The groundfishery brought in \$1.8 million, of which \$1.2 million was sablefish. The Port Orford fleet also targets crab (\$589,000) and sea urchins, which are sold to Asian markets (\$178,000).

Port Orford plants process and sell groundfish, crab, albacore, and salmon. Hallmark Fisheries, a major processor with branches or buying stations in several coastal communities, operates a buying station in Port Orford.

Bandon

Bandon was built near the site of an important Coquille Indian village on the shores of the Coquille River. In 1826, the village was visited by Hudson's Bay Company traders; a deadly skirmish between the local natives and hungry American explorers took place there in 1851. In 1852 gold was discovered near Bandon, attracting a rush of miners and other Americans and Europeans who began to settle near the estuary. The river mouth was surveyed for navigation in 1860, and in 1881 local residents began building a jetty at Bandon (Hall 1995).

The commercial district of Bandon was destroyed by a fire that started in a cafe in 1914, and the entire city of Bandon burned in a fire that began in the forest during a hot, dry fall in 1936. After each fire, the community slowly rebuilt. Even though jetties were completed in 1908, the entrance channel wasn't finished until 1933.

Between 1990 and 1997, Bandon's population increased by 25.3 percent to 2,790 people. The median household income in 1990 was 65 percent of the state average. The city has a large portion of retirees, many of whom moved from California and other states seeking a less expensive retirement home. In 1990, the median age in Bandon was 47.

Bandon has established itself as a major coastal tourist destination, with the building of a cheese factory, cranberry factory, new restaurants, and remodeled buildings selling arts and crafts. Bandon hosts a Cranberry Festival each September. Lumber and fishing are also primary industries. The largest employer and manufacturer in town is Bandon Bay Fisheries, with 80 employees; next comes Oregon Overseas Timber (40 employees), Hardin Optical (30 employees), and the Bandon Bay Cheese Factory (26 employees).

Bandon has one high school, a public library, and a historical society, which runs a museum. Southwestern



Port Orford

Community College's Coos Bay campus, 25 miles away, is the nearest source of continuing education. Bandon has a 24-bed hospital and a Dial-A-Ride transportation program. The Coquille tribe built a large commercial retirement home and Alzheimers care facility on a sacred site, and the community uses its main hall for various events.

Both the Port of Bandon and the city of Bandon exert much influence on civic affairs. The Port of Bandon ships about 300 tons of forest products each year. Its operating budget is \$322,000 a year, which includes recreational and moorage facilities. The port is classified as shallow draft, with a 13-foot entrance.

Bandon has a small fishery comprising small boats. In 1997, they brought in \$28,000 ex-vessel, which contributed \$73,000 to the Bandon economy after processing and multiplier effects. Fishers concentrate on chinook salmon, albacore, crab, and rockfish. Both Eureka Fisheries and S&S Seafoods have buying stations in Bandon, and Bandon Bay Fisheries processes shrimp (imported from other communities), groundfish, and crab. There are also several small fish markets that purchase, retail, and wholesale locally caught seafood.

Charleston, Coos Bay, and North Bend

The first commercial schooner crossed the Coos Bay bar 1852, loaded with supplies to stock the newly opened mines at Jacksonville and Gold Hill in the interior. The Coos Bay area, settled in 1874, was named for the local Kusan Indians. With the largest deepwater port on the Oregon coast, Coos Bay is a center for shipping logs, lumber, and other wood products. The commercial fisheries are centered at Charleston, on the south end of the Bay. The Charleston area is unincorporated.

Coos Bay is an important regional hub, and as a community it includes the towns of North Bend, Charleston, and Eastside. Coos County has seen major population swings over the decades. After World War II, the population increased rapidly as the timber, plywood, and paper industries expanded. However, during the 1960s, as older mills closed, there was out-migration. The population increased again during the 1970s as the coastal economy experienced a boom in the timber industry. In the 1980s, although the timber industry declined, Coos Bay became a major retirement destination. Since 1987, as the timber industry has

stabilized, Coos County's population has established an overall upward trend. In 1997, Coos County's population was 61,400, up 1.9 percent since 1990. In 1990, the median household income for Coos Bay was 79 percent of the state average.

Coos Bay has one high school, a public library, and the main campus of the Southwestern Oregon Community College (SOCC). The Oregon Institute of Marine Biology, affiliated with the University of Oregon, is located in Charleston. Both SOCC and the South Coast Business Employment Corporation offer workforce training opportunities. Coos Bay has a 125-bed hospital and a Dial-A-Ride program. There are several parks and recreational areas near the bay.

The Oregon International Port of Coos Bay is a deep-draft harbor, with an entrance maintained at 47 feet. The port has a \$1.9 million operating budget. In 1995, 3.7 million tons of forest products were shipped from Coos Bay. Roseburg Forest Products, Weyerhaeuser, and International Paper all have facilities in the area.

Charleston is one of Oregon's major fishing ports and fish processing centers. Hallmark Fisheries, located in Charleston, employs 100 people. Other fish processors and buyers located in Charleston include Eureka Fisheries, Hallmark Fisheries, Ocean Beauty Seafoods, Del Mar Seafoods, the Pacific Group, and S&S Seafoods. They process, wholesale, retail, and export salmon, albacore, shrimp, groundfish, crab, and a variety of other species.

Ex-vessel value of landings in Charleston amounted to \$12.1 million in 1997. Of this, groundfish (mainly sablefish, rockfish, sole, and thornyheads) accounted for \$7.5 million; shrimp, \$2.1 million; and crab, \$1.5 million. The total personal income contribution of commercial fishing to the greater Coos Bay area was \$25.4 million (Radtke and Davis 1998). An economic analysis of the groundfish cuts projected that Charleston would lose the equivalent of 255 jobs (Radtke and Davis 1997).

Winchester Bay

During the 1970s, the Port of Winchester Bay invested heavily in expanding its facilities to attract recreation and commercial salmon fishers from the lower Willamette Valley. During the late 1970s and the 1980s, the port in this unincorporated area at the mouth of the Umpqua River boomed, and in the summer its slips were full. The economy of Winchester

Bay and the neighboring community of Reedsport benefited substantially from the port development.

Because Winchester Bay is unincorporated, there is little information available about employment and industrial activity. The population of nearby Reedsport has grown by less than 1 percent between 1990 and 1997, to 4,835. In 1990 its median household income was 91 percent of the state average. Reedsport's largest employer is International Paper, with 296 employees. However, International Paper announced in 1998 that it planned to close this plant. Other industries in the area manufacture fishing boats and gear, computer software, and sand and gravel products.

Reedsport has one high school and a public library. The nearest community college and workforce training programs are in Coos Bay, 27 miles away. Reedsport has a 20-bed hospital and no public transportation.

Fishing in Winchester Bay has been curtailed to protect coho salmon, which was once the primary target of Winchester Bay fishers. As coho seasons were cut back and finally closed, Winchester Bay and Reedsport's economy withered. Reedsport was doubly affected by declines in the timber industry and closure of mills in Gardiner.

Fishing is still a major source of income in Winchester Bay. The 1997 estimated economic contribution from fishing was \$1.8 million, which was expected to decline slightly in 1998. Winchester Bay's fleet is made up primarily of small boats that concentrate on crab (worth \$714,000 ex-vessel in 1997), groundfish (\$200,000, mainly sablefish), and albacore (\$84,000). Total ex-vessel value of landings amounted to \$1.04 million in 1997.

One processor in Winchester Bay, the Sportsmen's Cannery, processes salmon, albacore, groundfish, and crab. Local restaurants and one local fish market also purchase fish.

The Port of Umpqua/Salmon River Harbor Marina is a shallow-water port with an entrance of 26 feet. The port has an operating budget of \$362,000, and manages shipping facilities as well as support services for recreational and commercial fishing.

Florence

Florence, at the mouth of the Siuslaw River, gets its name from a lumber ship that wrecked there in 1875. The first buildings were around the mouth of the river, but when the bridge over the Siuslaw was com-

pleted in 1936, growth relocated along the highway. The Old Town area was rediscovered in the 1970s, when old buildings were rehabilitated and new construction, including major waterfront renovations, was undertaken. Florence is surrounded by sand dunes, some of them up to 500 feet high, and the area is dotted with small freshwater lakes. The Oregon Dunes Recreation Area was created in 1972.

Florence has seen substantial growth during the past decade, as the population increased 27 percent between 1990 and 1997 to 6,570. The median household income in 1990 was 70 percent of the state average.

Four of the five largest manufacturers in Florence are lumber companies, and the Siuslaw School District employs 175 people. Florence has one high school, a public library, and a branch of Lane Community College. It also has a 21-bed hospital and public transportation.

The entrance at the Port of Siuslaw is classified as shallow, with an 18-foot draft. The port's operating budget is \$439,000. Activities involve a shipping terminal, as well as recreational and commercial moorage and support services.

Commercial fishing contributed \$802,000 ex-vessel in 1997, making the total economic contribution \$1.1 million. This contribution was expected to decline only slightly in 1998. Major catches are of crab (\$401,000 ex-vessel), groundfish (\$227,000, mainly sablefish), and chinook salmon (\$139,000). Crab, salmon, lingcod, and other rockfish are sold fresh to markets and restaurants or are sold off the dock to locals and tourists. International C-Foods also processes salmon, shrimp, groundfish, and crab in Florence.

Newport

The Yaquina River was first surveyed in 1852, by Captain Collins on the schooner *Juliet*. When he sailed too close to shore, the vessel was wrecked north of the river's entrance. While Collins and his crew waited to be rescued, Collins surveyed the area and labeled the Yaquina a fine river.

Fishing, timber, and tourism have been an important part of Newport's character since the arrival of the first European settlers. Early residents dreamed of a port city that would control North Pacific commerce, luring trade from Astoria and Portland. The Oregon Pacific Railway was completed between Corvallis and Yaquina City in 1885. A steamship passenger service

was inaugurated between Yaquina Bay and San Francisco, but plans floundered when the *S.S. Yaquina City* ran aground in 1887 on the south jetty, which the Army Corps of Engineers had begun building in 1880. The north and south jetties were completed in 1896.

Newport was established in 1866, incorporated in 1882, and named for Newport, Rhode Island. Thanks to the railroad link with the Willamette Valley, it was an early and popular tourist spot for visitors from the valley. The early town was built around the bayfront, but when U.S. 101 was completed in the 1930s, growth moved away from the bay.

Newport is the Oregon coast's administrative center and the Lincoln County seat. It houses Oregon Coast Community College, which offers workforce training opportunities, and it has strong links with Oregon State University, which operates the Hatfield Marine Science Center at South Beach. The center houses offices for several state and federal agencies. Newport is also home of the Oregon Coast Aquarium. Newport has a strong fishermen's wives group that has been active for 20 years and sponsors the yearly Blessing of the Fleet.

Newport's 1997 population was 9,960, 18 percent more than in 1990. Many workers are employed in industries with seasonal unemployment, including farming, wood products, and tourism. The top five manufacturing employers in Newport are Ocean Beauty Seafoods (500 employees), Newport Shrimp Co. (250 employees), Depoe Bay Fish Co. (210 employees), Mo's Enterprises (65 employees); and Alsea Veneer (65 employees). Median family income in Lincoln County was 88 percent of the state average.



Newport bay front

Newport has one high school and a public library. There is a 48-bed hospital in Newport and public transportation.

Newport is one of the coast's major fishing ports, with a strong history of innovation. Midwater technology was pioneered at Newport during the 1970s, creating the fishery for whiting and all species of rockfish. Fishing contributed \$92.7 million in personal income to the Newport economy in 1997 (Radtke and Davis 1998). The ex-vessel value of fish landed in Newport was \$20.9 million in 1997. Of this, groundfish accounted for \$10.5 million (mainly sablefish and whiting); crab, \$3.7 million; albacore, \$2.9 million; shrimp, \$1.9 million; and chinook salmon, \$1.9 million. Some Newport fishers spend most of the year fishing in Alaska, the South Pacific, or up and down the west coast.

Newport is a major processing center whose plants include Hallmark Fisheries, Depoe Bay Fish Company, Newport Shrimp Company, Ocean Beauty Seafoods, Pacific Shrimp, and Pacific Whiting. Groundfish, shrimp, crab, salmon, and albacore are processed in Newport; whiting is made into surimi, fish meal, headed and gutted product, and block fillets. All the major groundfish species are landed at Newport, where some 115 million pounds of fish were processed in 1996.

The Port of Newport is a deep-draft channel, with a maintained depth of 40 feet at the entrance to Yaquina Bay. The port's operating budget is \$1.4 million, which includes recreational facilities and a shipping terminal.

Depoe Bay

Although Depoe Bay (population 1,060) is one of the smallest fishing ports on the coast, it is also one of the most picturesque. Rocks line the narrow, short entrance to the bay, which is 65 feet wide and only 6 to 8 feet deep. The harbor entrance is spanned by an elegant 1930s-era bridge that provides a popular spot for tourists to watch boats entering and leaving the bay. During the Fleet of Flowers ceremony, which takes place every Memorial Day, boats lay wreaths of flowers at sea in memory of those who have lost their lives on the ocean.

Depoe Bay is unincorporated, so there is little demographic or economic informa-

tion available. However, fishing contributed \$577,000 in personal income to the community in 1997, of which ex-vessel value of landings accounted for \$181,000. The size of the entrance to the bay has always limited the size of the vessels that can use the port, and so fishers concentrate on crab (\$126,000 ex-vessel in 1997), groundfish (\$24,000, mainly lingcod), and sea urchins (\$23,000). There are no major seafood processors in Depoe Bay, although the Siletz Tribal Smokehouse, the Spouting Horn Restaurant, and an independent buyer all buy local salmon, albacore, and other fish.

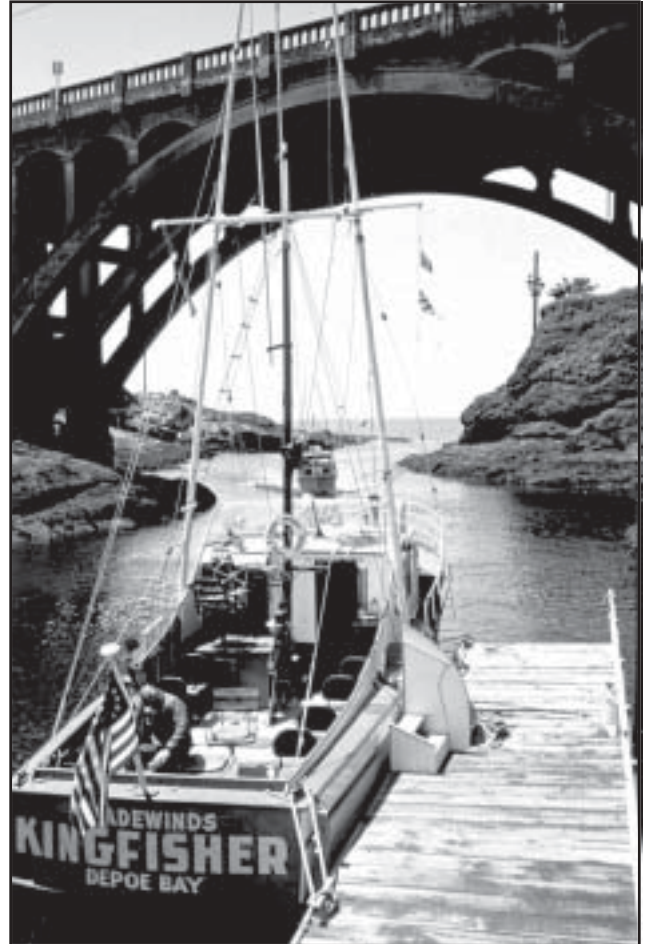
Pacific City

Pacific City is known for its dories, which are flat-bottomed boats launched from the beach rather than from a harbor. The Pacific City dory is an Oregon invention, different from California dories and the Newfoundland dories traditionally used for trawling and whaling. The original boats were made with spruce planking; seven of them, built with marine plywood, are still used in Pacific City (Hanneman 1998, personal communication).

Fishers began launching dories at Pacific City around 1910. In 1926, when the Nestucca River was closed to gillnetting, ocean fishing increased and fishers began launching their dories from the beach at Cape Kiwanda. Early dory fishers used oars to fight their way through the surf, but in 1960–61, a square stern was adopted and high-speed motors were added to increase mobility. During the '60s and '70s, hundreds of dories were launched each day, most of them seeking coho salmon or rockfish. In 1976 Pacific City was the second-largest salmon fishing port on the Oregon coast. As fishing restrictions have increased and coho numbers have declined, however, so has the Pacific City dory fleet dwindled. Now approximately 200 commercial and recreational dories fish from Pacific City.

Pacific City is unincorporated and has no port district. It is part of Tillamook County, which has seen large increases in retiree population during the last decade. The overall 1996 population in Tillamook County was 23,800, with almost two-thirds living in unincorporated areas.

Although dairy products dominate the Tillamook economy, fishing contributes \$2 million in personal income to Pacific City (Radtke and Davis 1998). Small boats concentrate on crab, chinook salmon, lingcod, and rockfish. In 1997, the ex-vessel value of landings was \$61,000, of which \$44,000 was groundfish and



Depoe Bay

\$8,000 was crab. Most of the fish landed in Pacific City are sold locally to a commercial buyer. Crab are sold in Garibaldi, and chinook are sold in Lincoln City, Newport, and Garibaldi (Hanneman 1998, personal communication).

Garibaldi/Tillamook Bay

The communities of Tillamook Bay include Garibaldi (population 980), Rockaway (1,205), Bay City (1,145), and Tillamook (4,340). Garibaldi, the bay's fishing center, is on the site of a Tillamook Indian settlement. In 1885 a mill was established at Hobsonville, one and a half miles south of Garibaldi. Garibaldi was incorporated in 1946. It is named for the Italian patriot, Giuseppe Garibaldi.

Garibaldi grew 10.6 percent between 1990 and 1997. In 1990 its median household income was 70 percent of the state average. Agriculture, lumber, recreation, and fishing are Tillamook county's main industries, and Garibaldi's largest employer is Garibaldi Dry Dock, which employs 65 people. In Bay City, the

Tillamook County Smoker employs 160 people in processing fish.

Garibaldi has one high school and a public library. The nearest community college is Tillamook Bay Community College in Bay City, four miles away. The nearest hospital is nine miles away in Tillamook. Garibaldi has no public transportation.



Pacific City

The Tillamook State Forest is a major factor in the Tillamook County economy, which includes Garibaldi. A series of forest fires in 1933, 1939, 1945, and 1951 destroyed much of the old growth forest in the county. Logging on the 518,000 acres of state land in Clatsop and Tillamook Counties is expected to rise dramatically over the next several decades as stands replanted after the burn mature. Logging projections by the Oregon Employment Department call for the annual cut to jump from the 50–60 million board feet now harvested to 200 million board feet by the year 2020. The Tillamook State Forest also has plans to increase recreational and educational opportunities through a new interpretive center. In addition, management is focusing on improving wildlife and fish habitat. As a result, the development of habitat conservation areas for endangered species may curtail the increase in timber production.

The Port of Garibaldi is a shallow-water port, with an 18-foot entrance channel. The port district has a budget of \$315,000, with which it operates an industrial park, a picnic area, a campground, a shipping terminal, a launch ramp, wet/dry moorage, and land leases.

Commercial fishing contributed \$4.1 million in personal income to the Tillamook Bay area economy in 1997 (Radtke and Davis 1998). That year, landings of crab in the Tillamook Bay area were worth \$580,000 ex-vessel. Shrimp were worth \$421,000; groundfish, \$165,000; albacore, \$219,000; and Chinook salmon, \$59,000. Plants in the Tillamook Bay area (including

Hoy Brothers Fish and Crab, Smith Pacific Shrimp, the Tillamook Bay Smokehouse, and Pacific Coast Seafoods) process shrimp, crab, salmon, albacore, sole, thornyheads, sablefish, lingcod, and other rockfish.

Lower Columbia River

The mouth of the Columbia River has always been an important fishing area. Limited trade with the Indians began in 1792, when Captain Robert Gray and his ship, *Columbia Rediviva*, crossed the bar, drawn by the sea otter trade. In 1806 Lewis and Clark arrived at the mouth of the river, where they mapped an Indian village called “La’t’cap,” which means “dried salmon.” The name was adapted to “Clatsop.” Astoria, founded by John Jacob

Astor, who was seeking a suitable place for a fur trading company in 1811, became the largest city in Clatsop County.

Astoria was established in 1856. In 1998, moorage areas include the West Basin, East Basin and Young’s Bay, as well as the communities of Warrenton (population 4,040) and Hammond (unincorporated), which are close to the mouth of the Columbia River. The Washington side of the Columbia, including Ilwaco, Chinook, Skamokawa, and Cathlamet, combine with the Oregon communities of Svenson, Knappa, and Westport to create a physically dispersed, but culturally close, fishing community. The community was initially integrated by the Columbia River Fishermen’s Protective Union.

Astoria showed some population loss between 1960 and 1970, but the population has been stable during the last decade. The 1997 population was 10,110, less than one-half percent higher than in 1990. Retirees are attracted to the area, but there has been a trend of out-migration among younger workers looking for better job opportunities. The Oregon Employment Department projects additional retiree population for the Astoria and Clatsop County area; however, the

department says that uncertainty over the amount of timber and fish that will be available to harvest continues to be a major concern. In 1990, the median household income in Astoria was 90 percent of the state average.

The two largest manufacturing employers in Astoria are Crystal Ocean Seafood (225 employees) and Bornstein Seafood (100 employees). The Coast Guard employs 386 people in Astoria. Astoria has one high school, two public libraries, and Clatsop Community College, which provides fishery safety and workforce training. Other training opportunities exist at the Management and Training Corporation, Tongue Point Job Corps Center, and Marine Environmental Research and Training Station. Astoria has a 49-bed hospital and a Special Mobility Services transportation program.

The area's economy and culture are influenced by geography: the Columbia River to the north, with its runs of salmon; and the Coast Range, with its softwood forests of old growth Douglas fir. Lumber, wood products, and paper are the major manufacturing industries. The spectacular scenery, accessible public beaches and parks, and rural atmosphere and fishing character of the towns have combined to make tourism a primary growth activity. Because many residents trace their heritage to Scandinavia, Astoria puts on a Scandinavian Festival each summer that celebrates its fishing heritage.

Astoria is steeped in fishing and maritime history. The Columbia River Maritime Museum draws visitors, as does the Coast Guard lightship *Columbia*, moored outside the museum. The 1885 home of Captain George Flavel, a pioneer Columbia River bar pilot and one of the area's first millionaires, is also a public museum. The National Parks Service operates the Fort Clatsop National Memorial, site of the 1805–06 winter encampment of Lewis and Clark.

The Port of Astoria is a deepwater port. The navigation channel is maintained at between 48 and 55

feet at the entrance. The port has a \$2.2 million operating budget, which includes money to operate an airport, an industrial park, a shipping terminal, launch ramps, a hoist, wet/dry moorage, and various buildings. Waterborne commerce includes forest products, commercial and recreational fishing, and recreational boating.

Historically, salmon has been a mainstay of the Astoria fishing economy. But groundfish has made up an increasing portion of the total catch in recent years, and plants have diversified into whiting products. As salmon catches are restricted on the Columbia, gillnetters spend more time fishing in Alaska, which brings a significant amount of income to the lower Columbia area.

Astoria is Oregon's third major fishing port. Hammond is oriented toward private recreational fishing boats and trollers, whereas Warrenton has larger professional boats that focus on groundfish, crabbing, and charters. In 1997, fishing contributed \$68.4 million in personal income to the Astoria area (Radtke and Davis 1998). In 1997, the ex-vessel value of all fish landed in Astoria was \$22.4 million, of which \$13.1 million was groundfish, \$5.1 million was crab, \$2.6 million was albacore, and \$1.2 million was shrimp. Groundfish harvest restrictions are projected to cost the Astoria area 309 jobs, a greater impact than in any other community. Most of the restrictions will be because of cuts in quotas of yellowtail rockfish, which are a major component of the species processed at Astoria plants.

As of 1999, there are at least 15 processing plants in the Astoria area that process and export whiting, shrimp, crab, albacore, salmon, groundfish, and a variety of other species. These include a whiting processing plant in Hammond (the Point Adams Packing Company) and three seafood processors in Warrenton.

Appendix C: Annotated List of Related Studies

A

1. Anonymous. 1978. Not quite all about limited entry. *Oregon Commercial Fisheries* 10(1). Corvallis, OR: Sea Grant Marine Advisory Program, Oregon State University Extension Service.
Reports on a spirited discussion of limited entry held at the July, 1978 National Conference to Consider Limited Entry as a Tool in Fishery Management. A case study in the difficulty of managing the commons.
2. Agar, M. 1980. *The Professional Stranger*. New York: Academic Press.
A clearly written, interesting introduction to ethnographic research.
3. Alkire, C. 1993. *Wild Salmon as Natural Capital: Accounting for Sustainable Use*. Washington D.C.: The Wilderness Society.
Analyzes the economic value of salmon, showing that the benefits of protection outweigh the costs.
4. Andersen, R. 1978. The need for human sciences research in Atlantic coast fisheries. *Journal of the Fisheries Research Board of Canada* 35(7)1031–1049.
Argues that the fishing enterprise cannot be isolated from those who depend on it for their livelihood, and that by controlling changes in the fishing industry, it is possible to optimize the social benefit of the industry.

B

5. Ballard, K., and J. Roberts. 1977. *Empirical Estimation of the Capacity Utilization Rates of Fishing Vessels in 10 Major Pacific Coast Fisheries*. U.S. Department of Commerce, NOAA, National Marine Fisheries Service.
Estimates the harvesting capacity in the major elements of the U.S. Pacific fishing fleet: albacore, crab, groundfish, herring, salmon, shrimp, and tropical tuna.
6. Barber, W. E. 1987. The fisheries management structure and process under the MFCMA: a North Pacific perspective. *Fisheries* 12(6):10-17.
Reviews the fishery management process under the Magnuson Fishery Conservation Management Act, using the North Pacific Fishery Management Council as a model. Outlines five important problems facing fishery management councils: communicating, determining goals, obtaining timely data, lobbying, and dealing with regionalism.
7. Bay-Hansen, C. D. 1991. *Fisheries of the Pacific Northwest Coast Volume 1: Traditional Commercial Fisheries*. New York: Vantage Press.
Describes traditional commercial fisheries of the Northwest coast, beginning with observations of Nootka fishing in 1803. Examines the history of the herring, halibut, cod, shrimp, crab, shellfish, and pelagic fish fisheries; the British Columbian commercial fishery; Canadian-American relations regarding salmon; and Northwest fishers' relationship with Japan and Japanese markets.

8. Bottom, D. L., G. H. Reeves, and M. H. Brookes. 1996. *Sustainability Issues for Resource Managers*. General Technical Report PNW-GTR-370. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.
A series of essays that examine the historical, cultural, and philosophical issues that undermine the sustainability of natural resources. Discusses alternative approaches to conservation.
9. Boyd, R. T. 1990. Demographic history, 1774–1874. In *Handbook of North American Indians, Volume III: Northwest Coast*. Wayne Suttles, ed. Pp. 135–148. Washington, D.C.: Smithsonian Institution.
Updates previous population estimates made by Mooney and Hewes. Discusses the impact of epidemics on tribal populations.
10. Bradshaw, R. 1947. Oakridge 'Smith: a mighty man is he. *Northwest Magazine* (insert to the *Oregonian*). October 5, p. 3.
Describes the Oakridge timber industry in 1947 (including the promise of sustained yield harvesting) and profiles Oakridge's mayor.
11. Bromley, D. W. 1990. The ideology of efficiency: searching for a theory of policy analysis. *Journal of Environmental Economics and Management* 19(1):86–107.
Explores the ideology of efficiency with respect to its consistency and coherence within economics and its correspondence to reality. Notes that economic efficiency has no logical claim to objectivity.
12. Bromley, D. W., ed. 1992. *Making the Commons Work: Theory, Practice, and Policy*. San Francisco: Institute for Contemporary Studies.
A collection of papers presented at a National Research Council conference by economists, sociologists, geographers, and political scientists. Using case studies, the authors discuss theories and methods for studying groups that are collectively managing common property.
13. Brown, W. E., D. Larson, R. Johnston, and R. Wahle. 1976. *Improved Evaluation of Commercially and Sport-Caught Salmon and Steelhead of the Columbia River*. Corvallis, OR: Agricultural Experiment Station Special Report 463, Oregon State University.
Describes an evaluation methodology and shows the greater value of recreationally caught salmon in the Columbia River.
14. Buck, E. H., and P. W. Richardson. 1995. *Social Aspects of Federal Fishery Management*. Congressional Research Service Report for Congress. On-line document. <http://www.cnire.org/nle/mar-7.html>
Social aspects of federal fishery policy are based in the social conditions and values associated with the fishing community. At issue is whether the federal government should review its approach to the social aspect of fishery management. This report examines current and historical references to the social aspects of fishery management as they appear in legislation, and discusses the importance of considering these issues. Discusses possible alternative roles for the federal government.

C

15. Campbell, B. A. 1972. *Limited Entry in the Salmon Fishery: The British Columbia Experience*. Pacific Sea Grant Advisory Program pub. no. PASGAP-6. Vancouver, B.C.: University of British Columbia Centre for Continuing Education.
An early review of the British Columbia Salmon License Vessel Control Program. Discusses issues of whether to limit boats or individual licenses.
16. Carroll, M. S., and R. G. Lee. 1990. Occupational community and identity among Pacific Northwestern loggers: implications for adapting to economic changes. In *Community and Forestry: Continuities in the Sociology of Natural Resources*. R. G. Lee, D. R. Field, and W. R. Burch Jr., eds. Pp. 141–155. Boulder: Westview Press.
17. Charles, A. T. 1998. Fishery socioeconomics: a survey. *Land Economics* 64(3):276–295.
A review article that addresses the goals, objectives, and social and economic factors that affect the legitimacy and effectiveness of fishery regulations. Addresses contributions made by multiobjective socioeconomic analysis and notes insights generated by existing socioeconomic research.
18. Charles, A. T. 1994. Toward sustainability: the fishing experience. *Ecological Economics* 2(3).
Reviews the evolution of sustainability concepts and fishery management paradigms. Develops a “sustainability assessment” framework that includes ecological, socioeconomic, community, and institutional components, and analyzes policy directions for fishery sustainability.
19. Cobb, J. N. 1911. *The Salmon Fisheries of the Pacific Coast*. Document No. 751. Washington, D.C.: Bureau of Fisheries.
Historical data on the development of the fisheries from Alaska to California.
20. Cobb, J. N. 1930. *The Salmon Fisheries of the Pacific Coast*. Washington, D.C.: Bureau of Fisheries Document 1030.
A comprehensive, historical summary of all aspects of the salmon industry. Includes data on packs, exports, opening prices, establishment of canneries in each area, gear used, and hatchery effort.
21. Committee on Ecosystem Management for Sustainable Marine Fisheries. 1999. *Sustaining Marine Fisheries*. Washington, D.C.: National Academy Press. Available on-line at www.nap.edu/readingroom/.
A broad-based, holistic overview of marine fisheries, based on a National Research Council study. Includes input from fishery scientists, ecosystem and population ecologists, social scientists, economists, and fishers.
22. Cone, J., 1995. *A Common Fate: Endangered Salmon and the People of the Pacific Northwest*. New York: Henry Holt.
A personal history of the people involved in documenting, communicating, and resolving salmon problems. Focuses on the period 1985 to 1992, with historical flashbacks to the 1880s.

23. Cone, J., and S. Ridlington, eds. 1996. *The Northwest Salmon Crisis: A Documentary History*. Corvallis, OR: Oregon State University Press.
- A collection of 80 documents revealing the causes and early warning signs of the salmon crisis. Includes contributions from specialists in natural resources law, biology, tribal and Northwest history, and anthropology, and addresses such issues as habitat, hatcheries, hydropower, fisheries, Indian fishing rights, and watershed management. Includes historic photographs and other illustrations.
24. Conway, F. D. L., and M. J. Beals. 1997. *Seeking Professional Help with Emotional Stress and Strain*. Publication no. ORESU-G-97-005. Corvallis, OR: Oregon Sea Grant.
- This pamphlet offers suggestions for fishing family members seeking help with personal and family issues.
25. Cordell, J. 1989. *A Sea of Small Boats*. Cambridge, MA: Cultural Survival.
- A collection of readings about unwritten rules used by communities around the world to protect their resources. These rules often do not fit Western economic models of fisheries.
26. Costanza, R., F. Andrade, P. Antunes, M. van den Belt, D. Boersma, D. F. Boesch, F. Catarino, S. Hanna, K. Limburg, B. Low, M. Molitor, J. G. Pereira, S. Rayner, R. Santos, J. Wilson, and M. Young. 1998. Principles for sustainable governance of the oceans. *Science* July 10, 281:198–199.
- Proposes six core principles to guide the use of ocean resources and to promote sustainability. The principles relate to individual and corporate responsibility, scales of governance, precaution, adaptive management, full cost allocation, and stakeholder participation.
27. Craig, J. A., and R. L. Hacker. 1940. *The History and Development of the Fisheries of the Columbia River*. *Bulletin of the United States Bureau of Fisheries* 49:133–213.
- The most comprehensive study of Columbia River fisheries ever conducted. Reconstructs catch records from 1866 to 1935. Excellent discussion of the gears fished, development of the fishery, and participants in the fishery.
28. Cramer, L. A., and S. M. Cordray. Forthcoming. Resource reliance in a social context: human capital in fishing communities, businesses, and families.
- Reports on a study of human capital skills (e.g., education, job experience) of fishing and nonfishing family members in three Oregon coastal fishing communities. Results indicate similarities among families regarding the historical importance of commercial fishing, yet differences emerge between fishing and nonfishing families about the future directions the residential community ought to be going.
29. Crutchfield, J. A. 1979. Economic and social implications of the main policy alternatives for controlling fishing effort. *Journal of the Fisheries Research Board of Canada* 36:742–52.
- A note on the interaction of social and economic objectives for management, for example in employment. In isolated areas where employment opportunities are limited and opportunity costs of labor are low, maximizing employment in the fishery can be consistent with economic and social objectives.

30. Crutchfield, J. A., and G. Pontecorvo. 1969. *The Pacific Salmon Fisheries: A Study of Irrational Conservation*. Johns Hopkins University Press, Baltimore.

Criticizes the biological basis of salmon management as not thinking in terms of profit. Argues that considering profit in salmon management would protect resources, provide the highest incomes to fishers, and give consumers the lowest prices. Chapter II summarizes the argument for including economic considerations in fishery management.

D

31. Damron, J. E. 1975. The emergence of salmon trolling on the American Northwest coast: a maritime historical geography. Ph.D. diss., University of Oregon.

Describes how trolling developed between 1908 and 1912 as a supplement to gillnetting. Four geographic areas typified trolling—northern California, the Columbia River, Puget Sound, and southeast Alaska. As the resource began a slow decline in the 1930s, trolling boats adapted by being fitted for multiple fisheries.

32. Danowski, F. 1980. *Fishermen's Wives: Coping with an Extraordinary Occupation*. NOAA/Sea Grant Marine Bulletin 37. Kingston, RI: University of Rhode Island, Dept. of Sociology and Anthropology.

Reports on the roles of fishermen's wives in supporting the activities of commercial fishermen in the Port of Point Judith, Rhode Island.

33. Davis, A., and C. Bailey. 1996. Common in custom, uncommon in advantage: common property, local elites, and alternative approaches to fisheries management. *Society and Natural Resources* 9:251–265.

Examines case study and social research literature, highlighting conceptual-analytical strengths, shortcomings, and lessons related to fisheries management concerns.

34. Davis, D. 1986. Occupational community and fishermen's wives in a Newfoundland fishing village. *Anthropology Quarterly* 59(3):129–142.

This analysis of women's activities in a Newfoundland fishing village demonstrates that women act as arbiters of community ideology and identity through their family and household roles, extensive participation in women's voluntary associations, and labor in the fish processing sector.

35. Davis, S. W. and H. D. Radtke. 1994. *A Demographic and Economic Description of the Oregon Coast*. Newport, OR: Oregon Coastal Zone Management Association.

A frequently updated source of economic and demographic data for coastal communities such as Brookings, Charleston, Astoria, and Newport. Includes population and social characteristics; descriptions of fishing, agriculture, tourism, timber, and other industries; and a discussion of planning and policy issues.

36. Dewees, C. 1985. Technical innovation in the Pacific coast commercial trawling and salmon trolling fisheries. Ph.D. diss., University of California, Berkeley.

Examines the reasons fishers adopt or reject technical innovations related to fishing gear, safety equipment, and refrigeration. Results indicate that the attributes of innovations, as perceived by fishers, are critical in determining adoption or rejection. Results lead to recommendations for improving fishery extension, research, and management programs.

A part of this dissertation dealing with the trawl fleet between Santa Barbara and Newport, Oregon, was published in *Human Organization* 47(3):224–234.

37. Dixon, R., R. Lowery, J. Sabella, and M. Hepburn. 1984. Fishermen's wives: a case study of a middle Atlantic coastal fishing community. *Sex Roles* 10,1/2:33–52.
- Uses ethnography and a survey to describe and compare North Carolina fishermen's wives with nonfishermen's wives and fishermen from the same area. Finds that fishermen's wives are "substantially less than enthusiastic" about their husbands' occupations and that they dissuade their children from entering fishing.
38. Dodds, B. 1959. *The Salmon King of Oregon: R. D. Hume and the Pacific Fisheries*. Chapel Hill: University of North Carolina Press.
- Describes Hume's innovation as a salmon processor, first on the Sacramento River, then on the Columbia, and finally on the Rogue. Details his experiments in propagation and his control of the Rogue River fishery until the early 1900s.
39. Dyer, C. L., and J. R. McGoodwin, eds. 1994. *Folk Management in the World's Fisheries: Lessons for Modern Fisheries Management*. Niwot, CO: University Press of Colorado.
- Presents folk management, which addresses sustainability issues by engaging user cooperation, as an alternative approach to fisheries management. Examines the concept of cooperative management, using studies and ethnographies from around the world.

E–F

40. Feeny, D., S. Hanna, and A. F. McEvoy. 1996. Questioning the "tragedy of the commons" model of fisheries. *Land Economics* 72(2):187–205.
- Challenges the "tragedy of the commons" assumption that resources held in common will be overexploited. Critiques six assumptions contained in the tragedy of the commons model regarding individual motivations and characteristics, institutional arrangements, interaction among users, users' ability to create new arrangements, and the behavior of regulatory authorities.
41. Finch, R. 1985. Fishery management under the Magnuson Act. *Marine Policy* July:170–177.
- Considers the effectiveness of the Magnuson Act, concluding that although its management mechanisms work well, the act has succeeded more in developing fisheries than in conserving and restoring stocks.
42. Fitchen, J. M. 1990. How do you know what to ask if you haven't listened first?: Using anthropological methods to prepare for survey research. *The Rural Sociologist* Spring:15–22.
- A primer on using qualitative social research to design better surveys. Underscores the importance of ethnography as a base for quantitative research.
43. Fortmann, L. P., J. Kusel, and S. K. Fairfax. 1989. Community stability: the foresters' fig leaf. In *Community Stability in Forest-Based Economies*. D. C. LeMaster and J. H. Beuter, eds. Pp. 44–50. Portland, OR: Timber Press.
- Examines the political dimensions of community stability and its relationship to sustained-yield forestry. Suggests the concept of "community well-being" as an alternative to "community stability" as it has been redefined in industrial forestry.

44. Fricke, P. 1985a. The use of sociological information in the allocation of natural resources: a comparison of practices. *The Rural Sociologist* 5(2):96–103.
- Discusses the use of sociological information by natural resource managers, using the U.S. Forest Service and National Marine Fisheries Service as examples. Despite Magnuson and EPA requirements, sociological data (as of 1985) were neglected by these agencies although the Forest Service used it to a limited extent.
45. Fricke, P. 1985b. Use of sociological data in the allocation of common property resources: a comparison of practices. *Marine Policy* 9(1):39–52.
- A review of the use of sociological data in Fishery Management Plans, noting the incompleteness of data covering categories outlined in the National Standard Guidelines: ethnicity, family structure, community organization, age, education, employment, recreational fishing, fishery dependence, and income distribution. Contains references on the social analysis of U.S. fisheries.
46. Fricke, P. 1994. *Guidelines and Principles for Social Impact Assessment*. Interorganizational Committee on Guidelines and Principles. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-F/SPO-16.
- A primer on social impact assessment. Discusses the need for better understanding the social consequences of programs and policies. Includes a basic model for social impact assessment, steps and principles for the assessment process, and a useful bibliography.
- G**
47. Gale, R. P. 1985. Federal management of forests and marine fisheries: a comparative analysis of renewable resource management. *Natural Resources Journal* 25:275–315.
- A comparative sociological analysis of management styles and practices in the U.S. Forest Service, National Marine Fisheries Service, and Fishery Management Councils.
48. Gale, R. P., and S. M. Cordray. 1994. Making sense of sustainability: nine answers to “what should be sustained?” *Rural Sociology* 59(2):311–332.
- Discusses the many meanings of sustainability, explored through the questions: What is sustained? Why sustain it? How is sustainability measured? And what are the politics? Includes examples from agriculture, forestry, and fisheries.
49. Garrity-Blake, B. N.d. *To Fish or Not To Fish: Occupational Transitions Within the Commercial Fishing Community of Carteret County, NC*. UNC-SG 96-06. Raleigh, NC: North Carolina Sea Grant College Program.
- Reports on research into the experiences of former professional fishers in North Carolina, focusing on their new employment, skills that were transferred from fishing, training programs, job satisfaction, and the impact of their new jobs on family and income. Found that there were few “ex-fishermen” in the study area; most held nonfishing jobs but continued to fish commercially part-time.
50. Gatewood, J., and B. J. McCay. 1988. Job satisfaction and the culture of fishing: a comparison of six New Jersey fisheries. *MAST/Maritime Anthropological Studies* 1(2):103–128.
- Describes the different occupational cultures of several fisheries.
51. Gatewood, J., and B. J. McCay 1990. Comparison of job satisfaction in six New Jersey fisheries: implications for management. *Human Organization* 49:14–25.

Develops the distinction between occupational and geographic communities discussed in marine anthropology. Good source of references on community studies in anthropology.

52. Geertz, C. 1973. *The Interpretation of Cultures*. New York: Basic Books.
Discusses theory in symbolic anthropology, concentrating on ethnographic research to build dialogues between local communities and outside agencies and organizations.
53. Gersuny, C., and J. J. Poggie, Jr. 1973. The uncertain future of fishing families. *The Family Coordinator* (April).
In the context of early discussions of limited entry, this paper describes the quandary of families whose sons are unsure whether to enter into commercial fishing. Notes that in fisheries, "the central problem has become one of innovation in the area of human behavior rather than innovation in technology."
54. Gibbs, J. 1978. *Oregon's Salty Coast*. Seattle: Superior Publishing.
A popular history of the Oregon coast, including the history of native interactions with settlers. Includes photos and maps.
55. Gilden, J. D. 1997. An Oregon case study: gender roles, families, and timber communities in transition. In *Public Lands Management in the West: Citizens, Interest Groups and Values*. Brent Steel, ed. Pp. 173–184. Westport, CT: Greenwood Press.
Discusses how women and families have adapted to economic and social change in Oregon timber communities. Although the timber industry is dominated by men, women in timber communities are committed to the industry and bear much of the responsibility for helping their families and communities adapt to change.
56. Gilden, J. D., and C. L. Smith. 1996. *Survey of Gillnetters in Oregon and Washington: Summary of Results*. Publication no. ORESU-T-96-001. Corvallis, OR: Oregon Sea Grant.
The results of a 1995 survey of Oregon and Washington gillnetters, focusing on their views of salmon disaster-relief programs and salmon management issues.
57. Gilden, J. D., and C. L. Smith. 1996. *Survey of Oregon Trollers: Summary of Results*. Publication no. ORESU-T-96-002. Corvallis, OR: Oregon Sea Grant.
The results of a 1996 survey of Oregon troll permit owners, focusing on their views of salmon disaster-relief programs and salmon management issues.
58. Gilmore, J. C. 1986. *The World of the Oregon Fishboat: A Study in Maritime Folklife*. Ann Arbor: UMI Research Press.
Details groundfishing in Charleston, Oregon. In-depth study of 11 groundfishers and the technology used in fishing.
59. Goblirsch, G. 1997. History of Oregon's groundfish industry. Unpublished draft. Oregon State University, Extension Sea Grant Program.
A compilation of information from various sources, tracing the development of Oregon's groundfish industry from the late 1800s to the present.
60. Goblirsch, G., and F. D. L. Conway. 1996. *Fishing Families and Business Resource Kit*. Corvallis, OR: Oregon State University Sea Grant Program.

A compilation of more than 30 brief, practical publications on managing fishing business and family finances, keeping families strong, staying in or changing occupations, and local resources for fishing businesses and families.

61. Goode, G. B. 1887. *The Fisheries and Fishery Industries of the United States*. Government Printing Office, Washington DC.
 Reports early studies of Pacific Coast fisheries. Contains excellent data about fishing participation and fishing communities.
62. Gramling, R., and W. R. Freudenberg. 1990. A closer look at "local control": communities, commodities, and the collapse of the coast. *Rural Sociology* 55(4):541–58.
 Examines the effect of outside influences on two resource-dependent areas in Louisiana where communities had little control over their economic base, and "local control" was an illusion rather than a reality.
63. Griffith, D., and C. L. Dyer. 1996. *An Appraisal of the Social and Cultural Aspects of the Multispecies Groundfish Fishery in New England and the Mid-Atlantic Regions*. Bethesda: Aguirre International. On-line document: <http://www.nefsc.nmfs.gov/clay/Flynoaan.htm>
 Reports the first phase of a study conducted under contract for NOAA/NMFS. The study's goals were to identify fishing-dependent communities throughout the Northeast; to provide demographic information on fishers, fishing vessels, and people involved in fishing-related industries; to identify existing social science data and describe social issues that should be considered in the second phase of the project; and to develop a classification system to aid in predicting the social impacts of changing fishery regulations on fishing-dependent communities.
64. Grover, K., H. Fagin, and S. Habiger. 1997. Tourism in Lincoln and Douglas Counties: a community-based rapid needs assessment. Unpublished.
 A preliminary study providing background for an Oregon Sea Grant request for proposals. Explores the perceptions of ecotourism development on the Oregon coast held by coastal community members and Oregon state employees.

H

65. Hall, R., ed. 1995. *People of the Coquille Estuary: Native Use of Resources on the Oregon Coast*. Corvallis, OR: Words and Pictures Unlimited.
 An archaeological and ethnographic review of native and European settlement of the Coquille estuary.
66. Hamburg, K. 1994. Oakridge, Westfir propose timber trust to create jobs. *Oregonian*, July 7, p. B2.
 Describes the Oakridge Forest Trust, which aims at community-based management of timber harvesting in the Oakridge/Westfir area.
67. Hanson, E. E. 1998. Oregon coastal residents' attitudes on community participation in fisheries management. Master's thesis, Oregon State University.
 Reports on a study exploring whether Oregon fishing community residents are amenable to the concept of community management of commercial fisheries and what makes them more or less likely to support a community management approach.

68. Hanna, S. 1990. The eighteenth century English commons: a model for ocean management. *Journal of Ocean and Shoreline Management* 14:155–172.
 Uses the 18th-century English commons as an example of a successful resource-management institution that coordinated multiple resource uses, was flexible to changing environmental conditions, and embodied community control. The historical record on the enclosure of the commons suggests parallels with current privatization efforts that raise troubling distributional questions. Discusses issues central to the adaptation of the commons structure to current ocean management needs.
69. Hanna, S. 1991. The supply of Pacific U.S. groundfish: harvesting, processing, marketing and regulation. In *Econometric Modeling of the World Trade in Groundfish*. W. E. Schrank and N. Roy, eds. Pp. 225–240. The Hague, Netherlands: Kluwer Publishers, NATO ASI Series.
 A detailed description of the west coast groundfishery. Discussion of major species landed, methods of harvesting and processing, the market sector, and management issues. Includes graphs.
70. Hanna, S. 1992. Interactions between shellfish and groundfish fisheries on the west coast: the need for system management. *Journal of Shellfish Research* 11(1):131–139.
 Describes the groundfish trawl/shrimp trawl/crab pot fishery combination frequently found on the west coast. Discusses the nature of fishery interactions, the factors that link these fisheries, and implications for management.
71. Hanna, S. 1994a. Co-management. In *Limiting Access to Marine Fisheries: Keeping the Focus on Conservation*. K. L. Gimbel, ed. Pp. 233–242. Washington, D.C.: Center for Marine Conservation and World Wildlife Fund.
 Discusses the benefits and costs of co-management, in which power is shared between government agencies and user groups. Co-management's goals extend beyond efficiency to include equity and legitimacy. It requires investment in human resources and the development of coordination and negotiation skills.
72. Hanna, S. 1994b. Portfolio selection of fishing strategies in a multispecies fishery. In *Proceedings of the 6th Biennial Conference of the International Institute of Fisheries Economics and Trade*. Pp. 727–737. Paris, France.
 Examines the portfolio properties of mixed-species groundfish catches resulting from different fishing strategies. Analyzes the reduction in revenue variability from catch mixes as contrasted with single-species catches.
73. Hanna, S. 1995a. Efficiencies of user participation in natural resource management. In *Property Rights and the Environment: Social and Ecological Issues*. S. Hanna and M. Munasinghe, eds. Pp. 59–67. Washington, D.C.: World Bank.
 Focuses on the efficiency of resource management and the role played by user participation in management costs. Outlines how user participation in management can either increase or decrease management costs, depending on how participation is structured and used.
74. Hanna, S. 1995b. Institutional response to scarcity in Pacific groundfish fisheries. In *Proceedings of the 7th Biennial Conference of the International Institute of Fisheries Economics and Trade*. D. Liao, ed. Taipei, Taiwan.

Analyzes the management evolution that has accompanied the resource decline in the Pacific groundfish fishery. Describes three stages of fishery evolution during the period 1978–1992, analyzes the effect of increasing resource scarcity on management costs, and details the responses that have attempted to contain management costs.

75. Hanna, S. 1995c. User participation and fishery management performance within the Pacific Fishery Management Council. *Ocean and Coastal Management* 28 (1–3):23–44.

Describes four measures of management performance that are pertinent to sustainability: equity, stewardship, regulatory resilience, and efficiency. Analyzes three cases of user participation in groundfish management and how they relate to the four measures of management performance.
76. Hanna, S. 1996b. Social and economic path dependence in the construction of market-based fishery programs. In *Social Implications of Quota Systems in Fisheries*. G. Pålsson and G. Petursdottir, eds. Pp. 133–146. Copenhagen: Nordic Council.

Discusses sociocultural resistance to market-based fishery management programs worldwide. Uses three case studies to present the importance of cultural context in program development.
77. Hanna, S. 1997a. Scarcity, embeddedness and distribution in ecological policy. *Human Ecology Review* 4(1):43–44.

This short forum paper argues that distributional issues are at the core of all ecological policy and can hinder effective policy implementation. Discusses how policy implementation can be confounded by resource scarcity and by the embeddedness of people within larger social and economic spheres.
78. Hanna, S. 1997b. The new frontier of American fishery governance. *Ecological Economics* 20(3):221–233.

Discusses the institutional transformation necessary to achieve sustainable governance of fisheries. Includes a historical overview of the American use of resources as frontiers, rather than commons, and outlines behavioral differences between the users of frontiers and commons. Discusses the conditions required to develop institutions that are geared toward sustainable fishery management.
79. Hanna, S. In press. Co-management in small-scale fisheries: creating effective links among stakeholders. In *Proceedings of the International Workshop on Community-Based Resource Management*. Washington, D.C.: The World Bank.

Describes some problems with centralized resource management that have led to proposals for community-based resource management. Analyzes, for small-scale fisheries, the economic dynamics that influence the effectiveness of co-management systems. Focuses on the transaction costs of co-management and its requirements for human capital. Provides international examples of fishery co-management in practice.
80. Hanna, S. 1998. Institutions and the resolution of resource conflicts: principles and practice. In *From the Rivers to the Sea: Proceedings of the Joint Meeting of the Third International Conference on the Environmental Management of Enclosed Coastal Seas and the Seventh Stockholm Water Symposium*.

Examines how resource management institutions incorporate incentives that affect conflict resolution. Provides examples of conflict resolution in Oregon watershed councils; Willapa Bay, Washington; and the Columbia River.

81. Hanna, S., and S. Jentoft. 1996. Human use of the natural environment: an overview of social and economic dimensions. In *Rights to Nature: Ecological, Economic, Cultural and Political Principles of Institutions for the Environment*. S. Hanna, C. Folke, and K.-G. Maler, eds. Pp. 35–56. Washington, D.C.: Island Press.
- Provides an overview of the ways in which humans interact with the natural environment. Discusses the social and economic dimensions of views of nature, human behavior, resource use, and resource management institutions.
82. Hanna, S., and M. Munasinghe, eds. 1995. *Property Rights and the Environment: Social and Ecological Issues*. Washington, D.C.: The World Bank.
- A series of essays on property rights and ecological systems. Includes writings on the management of transboundary resources such as fisheries, and user participation in natural resource management.
83. Hanna, S., and M. Munasinghe, eds. 1995. *Property Rights in a Social and Ecological Context*. Washington, D.C.: The World Bank.
- A collection of essays on the social and ecological implications of property rights, with examples from around the world. Emphasizes the importance of understanding how property rights function in relation to humans and the environment.
84. Hanna, S., and C. L. Smith. 1993a. Attitudes of trawl vessel captains about work, resource use, and fishery management. *North American Journal of Fisheries Management* 13(2):367–375.
- Discusses a survey of trawl vessel captains, who are found to be diverse in their lifestyles and views toward work, risks, and the ocean environment. These findings challenge prevailing assumptions about fishers and have important implications for fishery management.
85. Hanna, S., and C. L. Smith. 1993b. Resolving allocation conflicts in fishery management. *Society and Natural Resources* 6(1):55–69.
- Presents four case studies of allocation management conflicts in the U.S. Pacific: fixed gear vs. trawl gear; treaty vs. nontreaty fisheries; the multilevel halibut fishery; and commercial vs. recreational fisheries. Discusses the processes used to solve these conflicts and characterizes the authoritative and participatory approaches to natural-resource conflict resolution.
86. Hardin, G. 1968. The tragedy of the commons. *Science* 162:1243–1248.
- Hardin's classic work on the dangers of public resource use, with the English commons as an example.
87. Harman, E. J. 1988. Strategy selection in the Oregon trawl fisheries. Master's thesis, Oregon State University.
- Using the Oregon trawl fishery as an example, this study explores different fishing strategies, from specialization to diversification. Fishers report that management significantly influences their selection of fishing strategies.
88. Harry, G. Y. Jr., and A. R. Morgan. 1963. *History of the Oregon Trawl Fishery, 1884–1961*. Portland, OR: Oregon Fish Commission Research Brief, 9:1:5–26.

Excellent description of the early Oregon trawl fishery, the development based on pilchard during the 1930s, and the impacts of World War II and the postwar mink food industry.

89. Hatley, T. A. 1976. Efficiency in Oregon's commercial salmon fisheries: a historical perspective. Master's thesis, Oregon State University.
Compares harvesting efficiency in the Oregon troll and gillnet fisheries, and the implications for management.
90. Hayden, M. V. 1930. History of the salmon industry in Oregon. Master's thesis, University of Oregon.
A history of the Oregon salmon industry, with a focus on Columbia River gillnetting.
91. Hibbard, M., and L. Davis. 1986. When the going gets tough: economic reality and the cultural myths of small-town America. *American Public Administration Journal* 52(4):419–428.
Using Oakridge, Oregon, as an example, this paper discusses the idealized image of small-town America and how it influences residents' notions of community and social relationships. This idealization leads to self-deception and has important implications for planning and resource management.
92. Hibbard, M., and J. Elias. 1993. The failure of sustained yield forestry and the decline of the flannel shirt frontier. In *Forgotten Places, Uneven Development in Rural America*. W. W. Falk, ed. Pp. 195–217. Lawrence: University of Kansas Press.
Examines the history of sustained-yield forestry, using Oakridge, Oregon, as an example. Includes discussions of community stability as it relates to the timber industry; the recent history and culture of the timber industry; and the importance of recognizing community identity when managing resources and development.
93. Hittell, J. S. 1882. *The Commerce and Industries of the Pacific Coast of North America*. San Francisco: A. L. Bancroft.
Describes canneries, fishing practices, and communities in the early days of the salmon industry. Gives history of many canning establishments and provides estimates for Columbia River pack prior to 1881.
94. Holm, D. 1976. The dory story in Oregon. *Oregonian*, May 2.
Describes the use of dories in the Pacific City dory fishery.
95. Hume, R. D. 1893. *Salmon of the Pacific Coast*. San Francisco: Schmidt Label and Lithograph.
One of the first Columbia River cannerymen discusses the natural history of salmon, the effects of human development on the fish, and propagation techniques for salmon.
96. Hume, R. D. 1908. Solution of the salmon propagation [sic] problem. *Pacific Fisherman* 6.
Advocates the value of hatcheries and reports on Hume's experience with salmon propagation on the Rogue River.

97. Hume, R. D. 1961. *A Pygmy Monopolist: The Life and Doings of R. D. Hume, Written by Himself and Dedicated to His Neighbors*. Madison, WI: State Historical Society of Wisconsin.

An autobiography of one of the first salmon canners on the Columbia River, originally published by Hume in his own newspaper, the *Wedderburn Radium*, between 1904 and 1906.

98. Huppert, D. D., ed. *Limited Access Alternatives for the Pacific Groundfish Fishery*. NOAA Technical Report NMFS 52. Washington, D.C.: U.S. Department of Commerce.

A collection of papers exploring different aspects of limited access, including a profile of the groundfish fishery, elements of a limited access program, and examinations of legal, administrative, and economic aspects of limited entry.

I-J

99. Jensen, V. M. 1970. *Early Days on the Upper Willamette*. Oakridge, OR: Upper Willamette Pioneer Association.

A history of the upper Willamette community, including Oakridge, Oregon. Details on settlement and the early days of the timber industry. Photographs.

100. Jensen, W. S. 1976. *The Salmon Processing Industry, Part One: The Institutional Framework and Its Evolution*. Publication no. ORESU-T-76-003. Corvallis, OR: Oregon State University Sea Grant and Agricultural Experiment Station.

A history of the salmon industry in the Pacific Northwest, focusing on the state of Washington. Presents a market structure analysis of the Puget Sound salmon fishery and discusses the biological forces and technological changes that shaped the salmon canning industry.

101. Jensen, W. S., and D. M. Egan. 1978. *Washington State Gear Reduction Program*. Portland, OR: Lewis and Clark College.

Summarizes the results of a Washington commercial gear buyout associated with implementing the Boldt decision and moving Washington's fishing effort from commercial to recreational.

102. Jenson, J. 1990. Rural families in transition. In *National Rural Studies Committee: A Proceedings*. Cedar Falls, IA. E. Castle and B. Baldwin, eds. Pp. 9–19. Corvallis, OR: Western Rural Development Center.

Discusses the experiences of rural families during times of transition, and their relationship with government-based and informal, community-based support mechanisms.

103. Jentoft, S. 1989. Fisheries co-management: delegating government responsibility to fishermen's organizations. *Marine Policy* 13(2):137–154.

Addresses the role of cooperative organizations in fisheries management and the ability of fishers' organizations to handle regulatory functions. Explores problems and benefits inherent in cooperative management.

104. Jentoft, S., and B. J. McCay. 1995. User participation in fisheries management: lessons drawn from international experience. *Marine Policy* 19(3):227–246.

Summarizes the findings of two studies of government-industry interaction in the seven Nordic countries, the USA, Canada, Spain, France, and New Zealand. Focuses on how user participation is incorporated into fisheries management.

105. Jentoft, S., B. J. McCay, and D. C. Wilson. 1998. Social theory and fisheries co-management. *Marine Policy* 22(4/5):423–436.

An analysis of the debate over the effectiveness of fishery co-management processes. Addresses problems with co-management from the perspective of its embeddedness in human communities.

106. Johannes, R. E. 1978. Traditional marine conservation methods in Oceania and their demise. *Annual Review of Ecology and Systematics* 9:349–364.

Describes and relates the decline of the millenia-old sustainable fisheries system used in Polynesia, Melanesia, and Micronesia.

107. Jones, W. G., and G. Y. Harry Jr. 1961. *The Oregon Trawl Fishery for Mink Food—1948–1957*. Research Brief No. 8(1):14–30. Portland, OR: Oregon Fish Commission.

An excellent historical document outlining the development of the trawl fishery to supply mink farms.

K–L

108. Larkin, P. A. 1977. An epitaph for the concept of maximum sustained yield. *Transactions of the American Fisheries Society*. 106(1):1–11.

Argues for a technocentric approach to fishing management, with fish first, economics second, and social problems a “distant” third. Notes that maximum sustainable yield may be rejected in favor of new concepts, but it has served to curb many fisheries problems.

109. Lee, K. N. 1993. *Compass and Gyroscope*. Washington, D.C.: Island Press.

Discusses the application of adaptive management in the Northwest Power Planning Council. Advocates a process of civic science in which science is the compass that identifies directions that will not work, and democracy is the gyroscope that keeps the process on course.

110. Lee, R. G. 1989. Community stability: symbol or social reality? In *Community Stability in Forest-Based Economies*. D. C. LeMaster and J. H. Beuter, eds. Pp. 36–48. Portland, OR: Timber Press.

Explores the meaning of community stability and the fact that it is not well understood. Discusses the idealism inherent in American views of “community” and the tension between these idealized views and the realities of natural resource-based communities. Presents approaches for measuring community stability.

111. Liao, D. S., and J. B. Stevens. 1977. The economic performance of Oregon’s commercial fishermen in 1972. *Marine Fisheries Review* 39(8):17–22.

Points out that most salmon trollers and gillnetters fished at an economic loss. The study’s goal was to determine the fees necessary to reduce effort in Oregon fisheries to achieve limited entry.

112. Lipset, S. M. et al. 1956. *Union Democracy*. Chicago, IL : Free Press.
An early study of occupational community, focusing on the United States printers union.

M

113. *Magnuson-Stevens Fishery Conservation and Management Act of 1996*. U.S. Public Law 94-265.
Text of the Act can be found at <http://www.nmfs.gov/sfa/>. This site includes the text of the Magnuson-Stevens Act and the Sustainable Fisheries Act of 1996, which revised the Magnuson Act into the Magnuson-Stevens Fisheries Conservation and Management Act. The Magnuson-Stevens Act includes a number of new provisions, of which sustainable communities is one. Also at the site are summaries of actions to implement the requirements of the Sustainable Fisheries Act.
114. Martin, I. 1994. *Legacy and Testament: The Story of Columbia River Gillnetters*. Pullman, WA: Washington State University Press.
A history of gillnetting and the communities that depended on gillnetting in the lower Columbia. First-person account of a gillnetting family. Excellent bibliography.
115. Martin, M., H. Radtke, P. Corcoran, B. Halpin, A. Rietmann, and G. Wingenbach. 1991. *Oregon Coastal Communities in Transition: A Case Study Approach*. Newport: Oregon Sea Grant and the Oregon Coastal Zone Management Association.
Case studies of community adaptation in Gold Beach, Yachats, and Garibaldi/Rockaway Beach, based on interviews with local residents, business leaders, and government officials. Useful local insights into community change.
116. Mason, D. T., and D. Bruce. 1931. *Sustained Yield Forest Management as a Solution to American Forest Conservation Problems*. Portland, OR: Mason and Stevens.
An early discussion of how stabilization of local communities, national timber supply, forest industries, and environmental conservation will benefit from sustained-yield forest management. Includes statistics on lumber production 1870–1930, projections of how long the timber supply will last, and an outline of the essential features of a sustained-yield forest management program.
117. Mathews, S. B., and W. E. Brown. 1968. *Economic Evaluation of the 1967 Sport Salmon Fisheries of Washington*. Technical Report 2. Olympia, WA: Department of Fisheries.
Gives the recreational value of sport-caught salmon. Brown developed the trip-cost methodologies to make this type of analysis.
118. Matsen, B. 1998. *Fishing Up North: Stories of Luck and Loss in Alaskan Waters*. Anchorage: Alaska Northwest Books.
A well-written, detailed description of the Alaska fishing industry. Discusses harvesting, processing, overfishing, foreign fishing, the Exxon Valdez, and the particular types of fish targeted and equipment used.
119. McCay, B. J. 1978. Systems ecology, people ecology and the anthropology of fishing communities. *Human Ecology* 6:397–422.
Reviews and critiques systems-ecological approaches to maritime anthropology. Uses research among commercial fishers in Newfoundland to explore an alternative approach

that emphasizes people rather than systems as starting points for study, and focuses on the role of larger social and political processes in affecting local communities.

120. McCay, B. J., and J. Acheson, eds. 1990. *The Question of the Commons: The Culture and Ecology of Community Resources*. Tucson: University of Arizona Press.

A reader of articles on community-based and cooperative management. Includes contributions by anthropologists, political scientists, and economists, and uses ethnographic case studies to critique the “tragedy of the commons.”

121. McCay, B. J., and A. C. Finlayson. 1995. *The Political Ecology of Crisis and Institutional Change: The Case of the Northern Cod*. Presented to the Annual Meetings of the American Anthropological Association, Washington, D.C. On-line document: <http://arcticcircle.uconn.edu/NatResources/cod/mckay.html>

Questions whether current fisheries crises will lead to changes in institutional culture. Examines the failure of conventional fisheries management in Newfoundland and Labrador, and how this crisis has created an opportunity to renegotiate traditional power relationships between fisheries management and fishermen.

122. McCay, B. J., R. Apostle, and C. F. Creed. 1998. Individual transferable quotas, co-management, and community. *Fisheries* 23(4)20–23.

Discusses the role of community in development of individual transferable quotas in Nova Scotia. Notes the need for flexibility in participation in transferable quotas and the way this affects the structure of fishing communities.

123. McCay, B. J., and S. Jentoft. 1998. Market or community failure? Critical perspectives on common property research. *Human Organization* 57(1):311–330.

Critiques revisionist approaches to the “tragedy of the commons.” Suggests an ethnographic approach to common property management that emphasizes a historical, social, and political perspective and focuses on community rather than market.

124. McCloskey, W. 1998. *Their Father's Work: Casting Nets with the World's Fishermen*. Camden, ME: International Marine.

A personal, accessible, colorful examination of fisheries issues around the world, from George's Bank to Ayukawa, Japan. Includes maps and photographs.

125. McEvoy, A. F. 1986. *The Fishermen's Problem: Ecology and Law in the California Fisheries*. Cambridge: Cambridge University Press.

A history of the California sardine fishery, including the lessons that can be drawn for today's fisheries.

126. McGoodwin, J. R. 1990. *Crisis in the World's Fisheries*. Stanford, CA: Stanford University Press.

Provides an overview of fisheries management policies around the world in the context of worldwide fishery reductions; argues for an increased focus on small-scale, rather than large-scale, fishery operations. Describes the process of fishery management and proposes improvements to the system.

127. Mederer, H. 1996. Surviving the Changes: Families Respond to Fishery Management. *Nor'easter* 8(2):12–33.
Based on a two-year study of a group of New England fishing families, this article discusses the effects of the transformation of the fishing industry on family life and offers ideas about how families respond to changes. The study illustrates how the problem of dangerously declining fish stocks is not only biological, but social as well.
128. Meyer, P. A. 1982. *Net Economic Values for Salmon and Steelhead from the Columbia River System*. NOAA Technical Memorandum NMFS F/NWR-3. Washington, D.C.: NOAA.
Estimates the value of Columbia River salmon to the Pacific Northwest. Takes a very wide view of benefits, providing an estimate of substantial value.
129. Miller, E. G. 1958. *Clatsop County, Oregon: Its History, Legends and Industries*. Portland, OR: Binford and Mort.
Contains detailed description of the salmon industry in Clatsop County.
130. Miller, M. L., and J. van Maanen. 1979. Boats don't fish, people do: some ethnographic notes on the federal management of fisheries in Gloucester. *Human Organization* 38(4):377–385.
Examines the occupational and social dimensions of Gloucester fishermen and how they are negatively affected by government policies that are insensitive to their problems. Contends that uncertainty, disruption, and other troubles result whenever formal rules are seen by the people expected to abide by them as being at odds with more immediate concerns. Interesting, readable insights into the culture of East Coast fishing.
131. Mrakovcich, K. L. 1993. Fishermen versus managers: perceptions and conflicts in the salmon fishery. Master's thesis, Oregon State University.
Reports the results of a survey of fishers and managers who are, and who are not, involved in the management decision-making process. The survey found that fishers and managers have different perceptions of certain fishery issues and that involvement in the decision-making process does not necessarily bring these perceptions into closer agreement.
132. Munro, G., N. Bingham, and E. Pikitch. 1998. Individual transferable quotas, community-based fisheries management system, and "virtual" communities. *Fisheries* 23(3):12–15.
Discusses the application of Individual Transferable Quotas (ITQs) to groups of fishermen, as opposed to individual fishermen. Applies a "virtual community" model to ITQ schemes.
133. Murdock, S. H., K. Backman, R. B. Ditton, Md. M. Hoque, and D. Ellis. 1992. Demographic change in the United States in the 1990's and the 21st century: implications for fisheries management. *Fisheries* 17(2):6–13.
Discusses the implications of demographic change—particularly an aging population and increased minority population—on recreational fisheries management. Aging anglers demand more services, but are often exempt from user fees. Managers will need to investigate new sources of program funding.

N–O

134. National Marine Fisheries Service. 1993. *Our Living Oceans: Report on the Status of U.S. Living Marine Resources, 1993*. Washington, D.C.: United States Department of Com-

merce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

A status review of U.S. living marine resources, providing an overview of the health of U.S. marine fisheries and protected marine mammals and sea turtles. Includes synopses focusing on the status of Pacific groundfish and salmon fisheries, Pacific marine mammals, Alaska groundfish and salmon fisheries, and other U.S. fisheries.

135. Oregon Coastal Conservation and Development Commission. 1974. *Economic Survey and Analysis of the Oregon Coastal Zone*. Florence, OR: Oregon Coastal Conservation and Development Commission.

A thorough inventory of the natural resources and economy of the Oregon coastal zone, undertaken for the preparation of a coastal conservation and management plan. Includes information on agriculture, food processing, fish, fish processing, forest products, and tourism. Also covers ports and other economic support systems, government employment, retirement, trades and services, and demographics, and presents an econometric model.

136. Oregon Coastal Zone Management Association. N.d. *Pacific Whiting: Resource Availability, Market use and Economic Development Potential*. Newport, OR: Oregon Coastal Zone Management Association.

Discusses changes occurring in the fishery for Pacific whiting as it moves from a joint-venture fishery to full domestic utilization in fishing and processing.

137. Oregon Economic Development Department. 1998. *Community Profiles*. Portland, OR: Oregon Economic Development Department. Current information on-line at <http://www.econ.state.or.us/comprof.htm>

A useful collection of data and statistics for incorporated Oregon communities. Includes information on location, climate, demographics, housing, economy, employment, industries, finances, education, community facilities, ports, infrastructure, land uses, and recreation.

138. Oregon Economic Development Department. Ongoing. *Strengths, Weaknesses, Opportunities, and Threats Analyses*. Salem, OR: Oregon Economic Development Department.

A series of studies outlining the strengths, weaknesses, opportunities, and threats affecting specific Oregon communities.

139. Oregon Department of Fish and Wildlife and Washington Department of Fisheries. 1938-. Status Report: *Columbia River Fish Runs and Fisheries, 1938-*. Portland and Olympia: Oregon Department of Fish and Wildlife and Washington Department of Fisheries.

Annual summary of fish statistics by species for the Columbia River. Also includes limited information on seasons and fishers.

140. Oregon Department of Fish and Wildlife. 1989. *Oregon's Sea Urchin Fishery, 1986-1988*. Progress Report. Portland, OR: Oregon Department of Fish and Wildlife .

Reports on an Oregon fishery whose attempts at controlling effort from the start were unsuccessful. Port Orford is the current center of Oregon sea urchin harvesting.

141. Oregon Progress Board. 1999. *Oregon Benchmarks*. On-line document: http://www.econ.state.or.us/opb/97tables/benchmarks_list.htm
- The Oregon Benchmarks, a set of measurable outcomes, were created by the Oregon Progress Board to help communities “plan for results.” This report presents data relating to each benchmark. More information on the benchmarks can be found at <http://www.econ.state.or.us/opb/index.htm>.
142. Oregon State University Fishing Families Project. 1998. West Coast fishing community health plan survey. Unpublished survey results. Corvallis, OR: Oregon Sea Grant and OSU Department of Sociology.
- This study surveyed 3,200 fishing households across four states (Alaska, Washington, Oregon, and California) regarding work and household, current health insurance coverage, family health, current use of health care services, and health plan preferences.

P

143. Pacific Fishery Management Council. Ongoing. *Preseason Reports I, II, and III. Stock Abundance Analysis for 19__ Ocean Salmon Fisheries*. Pacific Fishery Management Council. Portland, OR: Pacific Fishery Management Council.
- Gives the options for fishing times, locations, and species. The options are based on data from the *Review* document (see no. 144). This report is updated twice, so there are I, II, and III versions.
144. Pacific Fishery Management Council. Ongoing. *Review of 19__ Ocean Salmon Fisheries*. Portland, OR: Pacific Fishery Management Council.
- Annual updates of statistics on ocean salmon fisheries. Detailed fish statistics, harvest rules, and evaluation of status of stocks. Contains limited socioeconomic data.
145. Pacific Fishery Management Council. 1984. *Final Framework Amendment for Managing the Ocean Salmon Fisheries off the Coasts of Washington, Oregon, and California Commencing in 1985*. Portland, OR: Pacific Fishery Management Council.
- The overall plan for salmon management along the Pacific coast. This plan set the general goals and is updated annually.
146. Pacific Fishery Management Council. Ongoing. *Status of the Pacific Coast Groundfish Fishery Through 19__ and Recommended Acceptable Biological Catches for 19__*. Portland, OR: Pacific Fishery Management Council.
- A yearly report presenting the history of groundfish fishery management up to the current year, the economic status of the fishery, and final acceptable biological catch and harvest guidelines for groundfish for the current year. Includes detailed tables and figures.
147. Pacific Fishery Management Council. 1993. *Historical Ocean Salmon Fishery Data for Washington, Oregon and California*. Portland, OR: Pacific Fishery Management Council.
- Tables of historical data by state, from as early as data were available to 1990. Data for recreational and commercial catches are divided by area within each state.

148. Pacific Fishery Management Council. 1998. *Amendment 8 (Individual Quotas) to the Fishery Management Plan for Pacific Coast Groundfish*. Portland, OR: Pacific Fishery Management Council.
A review of options and recommendations for action on individual quotas.
149. Pacific Fishery Management Council. 1992. *Amendment 6 (Limited Entry) to the Fishery Management Plan for Pacific Coast Groundfish*. Portland, OR: Pacific Fishery Management Council.
A review of options and recommendations for action on limited entry.
150. Pacific States Marine Fisheries Commission. Ongoing. *Annual Report, For the Year 19__*. Gladstone, OR: Pacific States Marine Fisheries Commission.
Covers annual actions of the Commission. A data section gives historical trends for Alaska, Washington, Oregon, Idaho, and California by state and provides general totals by species fished.
151. Peluso, N. L., C. R. Humphrey, and L. P. Fortmann. 1994. The rock, the beach and the tidal pool: people and poverty in natural resource-dependent areas. *Society and Natural Resources* 7(1):23-38.
Discusses the unique properties of natural resource-dependent areas that create the potential for social poverty, including resource degradation, restrictive public land use policies, concentrated land ownership, and high rates of occupational injury. Examines two theories of poverty: advanced capitalism and internal colonialism.
152. Pinkerton, E. W., ed. 1989. *Cooperative Management of Local Fisheries: New Directions for Improved Management and Community Development*. Vancouver: University of British Columbia Press.
A reader of articles on community-based and cooperative management. Main topics are Indian-state co-management in the Pacific Northwest, nonindigenous commercial fishers creating regional and local co-management, creative institutional response in relation to aboriginal fishing rights, provisions in comprehensive claims for native self-management, and British Columbia native fishers.
153. Pinkerton, E. W. 1992. Translating legal rights into management practice: overcoming barriers to the exercise of co-management. *Human Organization* 51(4):330-341.
Examines strategies used successfully by environmental groups and Indian tribes to procure co-management agreements and have the agreements implemented.
154. Pinkerton, E. W. 1993. Co-management efforts as social movements. *Alternatives* 19(3):33-38.
Discusses efforts toward the development of the Tin Wis Forest Stewardship Act in British Columbia, a co-management approach bringing together trade unions, environmentalists, small businesses, and government. Notes four sociological and six political conditions necessary for the success of social movements.
155. Pinkerton, E. W. 1995. *Fisheries that Work: Sustainability Through Community-Based Management: A Report to the David Suzuki Foundation*. Vancouver: David Suzuki Foundation.

Uses success stories from around the world to describe necessary steps for creating community-based sustainable fisheries.

156. Pollnac, R. B., and S. J. Littlefield. 1983. Sociocultural aspects of fisheries management. *Ocean Development and International Law Journal* 12(3–4):209–246.

Examines sociocultural impacts of management decisions and makes suggestions concerning the integration of sociocultural data with bioeconomic data in developing models to be used in fisheries management. Examines the social environment of fisheries management, and describes successful traditional fishery management methods.

Q–R

157. Radtke, H. D. 1992. *Economic Contribution of Salmon to Oregon's Coastal Communities*. Newport, OR: Oregon Coastal Zone Management Association.

Provides a history of the commercial fishing industry from 1820 to 1991 and a discussion of harvest patterns, coastal fishing communities, changes in the seafood industry, and interception of Oregon salmon in other areas.

158. Radtke, H. D. 1992. *A General Description of the Seafood Processing Industry in Oregon*. Newport, OR: Oregon Coastal Zone Management Association.

Identifies processors located in Oregon ports, describes their affiliations, and reports areas served and species processed. References Brookings, Astoria, Newport, and Charleston.

159. Radtke, H. D. 1994. Salmon in the Pacific Northwest economy. Prepared for the Columbia River Alliance, Portland, OR.

Estimates the total income generated by harvest of Columbia River salmon. Columbia River chinook generated \$45 million in 1993—half in the ocean and half in the river. Harvests in Alaska and British Columbia accounted for half the ocean income.

160. Radtke, H. D. 1996. *The Cost of Doing Nothing: The Economic Burden of Salmon Declines in the Columbia River Basin*. Eugene, OR: Institute for Fisheries Resources, Northwest Regional Office.

Identifies the impact of loss in personal income caused by reduced availability and catches of Columbia River salmon.

161. Radtke, H. D. 1988. Community impacts of the sablefish fishery in Oregon and Washington. Yachats, OR. Photocopy.

Compares changes in the sablefish industry in Oregon and Washington between 1983 and 1987. Provides a representative description of vessels harvesting sablefish.

162. Radtke, H. D., and S. W. Davis. 1993. Economic description of coastal fisheries in the Pacific Northwest. Yachats, OR. Photocopy.

In 1989, 36 percent of personal income in Oregon coastal communities was generated by natural resources. Eight percent of the total personal income came from fishing. By 1992, reductions in salmon catch reduced income by 86 percent.

163. Radtke, H. D., and S. W. Davis. 1994. *The Economics of Ocean Fishery Management in Oregon*. Newport, OR: Oregon Coastal Zone Management Association.

Estimates personal income from fishing for major Washington, Oregon, and California ports.

164. Radtke, H. D., and S. W. Davis. 1994. Oregon's commercial fishing industry in 1992 and 1993. Newport, OR: Oregon Coastal Zone Management Association.

A review of Oregon's commercial fishing industry, containing the total volume and value of landings in Oregon, their contribution to the state's economy, and an estimate of the economic impacts of distant-water fisheries.

165. Radtke, H. D., and S. W. Davis. 1995. *Estimates of Economic Impacts from Ocean and Lower Estuary Commercial and Recreational Salmon Fisheries in 1995*. Newport, OR: Oregon Coastal Zone Management Association.

A study of the economic impacts of ocean commercial and recreational salmon fisheries, and coastal stream and estuary recreational fisheries.

167. Radtke, H. D., and S. W. Davis. 1996. *Lower Columbia River/Young's Bay Terminal Fisheries Expansion Project*. Astoria, OR: Salmon For All.

A business plan for the Clatsop Economic Development Council Fisheries Project. Summarizes market potential, financial plan, and economic contribution of smolt release programs in the lower Columbia and Youngs Bay.

168. Radtke, H. D., and S. W. Davis. 1997. *Final Report, Oregon Ports Economic Contribution Study*. Newport, OR: Oregon Coastal Zone Management Association.

Summarizes the many statistics about Oregon ports in terms of amount of shipping, economic indicators, and budgets. Evaluates the importance of Oregon ports to the economy.

169. Radtke, H. D., and S. W. Davis. 1998. Oregon's commercial fishing industry in 1996 and 1997. Yachats, OR. Photocopy.

A review of Oregon's commercial fishing industry, containing the total volume and value of landings in Oregon, their contribution to the state's economy, and an estimate of the economic impacts of distant-water fisheries.

170. Radtke, H. D., and W. S. Jensen. N.d. *Oregon's Commercial Fishing Industry: Its Importance to Oregon's Economy*. Portland, OR: West Coast Fisheries Development Foundation.

Summarizes the history of Oregon's commercial fishing industry prior to and after 1960. Describes the major gear types and reports the 1986 fishing income for Astoria, Brookings, Coos Bay, Newport, and Tillamook and for the state of Oregon by species.

171. Radtke, H. D., and W. S. Jensen. 1988. *An Economic Description of the Oregon Commercial Troll Salmon Fishery*. Corvallis, OR: Oregon State University Sea Grant College Program.

Results of a survey conducted during the best fishing year of the 1980s and 1990s. Documents that fishers place a higher value on fishing than measured by their gross income.

172. Rettig, R. B., and K. J. Roberts. 1971. *Commercial Seafood Industry of Oregon: A Comparison with Other Regions of the United States*. Special Report No. 331. Corvallis, OR: Oregon State University Sea Grant.

Written shortly after the creation of Oregon Sea Grant, this overview of Oregon's seafood industry summarizes information about employment in Oregon's fishing and processing sectors in the 1960s and reviews national information to provide a comparison. A third section discusses the demand for seafood and factors determining its values.

173. Rettig, R. B., and J. C. Ginter, eds. 1978. *Limited Entry as a Fishery Management Tool*. Proceedings of the National Conference to Consider Limited Entry as a Tool in Fishery Management. Denver. Seattle: University of Washington Press.

A collection of papers discussing the principles of limited entry and relating experiences with limited entry from Alaska, Michigan, Wisconsin, Washington, British Columbia, and Australia. Written two years after passage of the Magnuson Act.

174. Richards, J. 1968. An economic evaluation of Columbia River anadromous fish programs. Ph.D. diss., Oregon State University.

Evaluates the costs and benefits of public programs aimed at maintaining Columbia River anadromous fish runs and the value of Columbia River fisheries. Among the first attempts to make such an estimate. Good data on expenditures for fish passage.

175. Ricker, W. E. 1975. *Computation and Interpretation of Biological Statistics of Fish Populations*. Ottawa: Department of the Environment, Fisheries and Marine Service.

Describes methods used in fishery biology and management. Includes a glossary of biological terms relevant to fishery management.

176. Robbins, W. G. 1986. *Hard Times in Paradise: Coos Bay, Oregon, 1850–1986*. Seattle: University of Washington Press.

Covers the 136-year history of logging and the vulnerability of a local economy to market fluctuations. Describes life in a resource-based economy dependent on economic conditions beyond the control of the local community. Shows the transition from perspectives of unlimited resources to scarcity and economic decline.

177. Roth, D. 1991. Community stability, rural development, and the Forest Service. *Rural Development Perspectives*. October–January:35–39.

Discusses the Forest Service's approach to community stability and how this approach has changed as public values regarding forests have changed.

178. Ruddle, K. 1994. *A Guide to the Literature on Traditional Community-Based Fishery Management in the Asia-Pacific Tropics*. Fisheries Circular Number 869, FIPP/C869. Rome: Food and Agriculture Organization.

A country-by-country guide to literature on traditional Asia-Pacific fisheries management systems. Discusses their geographical distribution and characteristics, and explores major research issues related to traditional fisheries management.

179. Ruddle, K., and T. Akimichi. 1984. *Maritime Institutions in the Western Pacific*. Osaka: National Museum of Ethnology.

A collection of papers on fisheries management in the western Pacific, mainly Japan. Topics include sea tenure in feudal Japan, historical development of territorial rights and fishery regulations, territorial regulation in small-scale fisheries, subsistence and commer-

cial fishing, a review of seven important fishing disputes, fisheries cooperatives, social organization and types of sea tenure, aboriginal claims to coastal waters, traditional marine reserves, and defense of customary inshore sea rights.

180. Russell, E. S. 1942. *The Overfishing Problem*. Cambridge: The Cambridge University Press.

A series of five lectures given in 1939. Topics described are the exploitation of fish stocks, the depletion of older grounds, age analysis in fish populations, the overfishing problem, and the regulation of the sea fisheries. Includes graphs and index.

S

181. Salmon for All. 1996. Lower Columbia River salmon business plan for terminal fisheries. Portland, OR: Salmon for All.

Presents a detailed description of the Columbia River salmon fishery, including overviews of the industry, its products, its markets, and economic profiles. Suggests options for management of the fishery. Includes a Radtke and Davis report on the Youngs Bay terminal fisheries project.

182. Schallau, C. H., and R. M. Alston. 1987. The commitment to community stability: policy or shibboleth? *Environmental Law* 17(3):429–481.

Looks at the Forest Service's stated objectives regarding community stability, and the difficulty in evaluating compliance with these objectives.

183. Schallau, C. H. 1990. Community stability: issues, institutions and instruments. In *Community and Forestry: Continuities in the Sociology of Natural Resources*. R. G. Lee, D. R. Field, and W. R. Burch, Jr., eds. Boulder, Colorado: Westview Press.

Examines forest management policy issues that relate to community stability, and the history of the community stability concept. Provides an overview of economic literature on community stability.

184. Schuler, Francis M. 1974. Distributional considerations in the allocation of the production costs of marketable public outputs with application to Columbia River salmon hatcheries. Ph.D. diss., University of Rhode Island.

Documents the greater value of hatcheries to recreational fishing.

185. Shaffer, C., and K. Anundsen. 1993. *Creating Community Anywhere: Finding Support and Connection in a Fragmented World*. New York, NY: Tarcher/Perigee.

Examines different forms of communities and advocates creating new "conscious" communities that reflect our culture's increased flexibility. Discusses how to strengthen community connections and improve group dynamics. Provides references to organizations and resources focused on building communities.

186. Slickpoo, A. P. Sr., and D. E. Walker, Jr. 1973. *Noon Nee-Me-Poo: Culture and History of the Nez Percés. Nez Perce Tribe of Idaho*. Lapwai, ID: Nez Perce Tribe of Idaho.

A source for the transcript of treaty negotiations at Walla Walla between the U.S. government and current members of the Columbia River Inter-Tribal Fish Commission. Pages 83 to 142 contain a true copy of the Treaty of Walla Walla.

187. Smith, C. L. 1974. *Oregon Fish Fights*. Publication no. ORESU-T-74-004. Corvallis, OR: Oregon State University Sea Grant College.

Describes ballot measure conflicts over allowable gear in Oregon salmon fisheries from 1908 to 1974. Written as background on the 1975 Oregon ballot initiative to make steelhead a game fish.

188. Smith, C. L. 1977. *Fish or Cut Bait*. Publication no. ORESU-T-77-006. Corvallis, OR: Oregon State University Sea Grant College Program.
- A brief history of Oregon's commercial fisheries. Discusses Native American fisheries and treaties; the introduction of the European fisheries; the Columbia River salmon fishery; diversification into other species; the impacts of various ballot measures on allocation; and the search for stability in the commercial fisheries. Annotated bibliography.
189. Smith, C. L. 1979. *Salmon Fishers of the Columbia*. Corvallis, OR: Oregon State University Press.
- A history of the Columbia River canned salmon industry, from the 1800s to the 1970s. Discusses the fishers, canners, loss of habitat, fish fights, and fishery regulation. Includes photographs, maps, and diagrams of historical fishing methods.
190. Smith, C. L. 1980a. Attitudes about the value of steelhead and salmon angling. *Transactions of the American Fisheries Society* 109:272–281.
- Explores the factors that make fishing important to anglers and analyzes the importance of five factors: personal economic well-being, general economic well-being, professionalism, pleasure, and identity. A 1977 survey found that pleasure and identity were more important to anglers than economic factors.
191. Smith, C. L. 1980b. Management provoked conflict in fisheries management. *Environmental Management* 4(1):7–11.
- Examines the conflict between social goals and values held by fisheries managers and those held by fishers and the public. Points out that fishery management raises frustration among fishers because management reduces fishers' ability to meet their expectations.
192. Smith, C. L. 1981. Satisfaction bonus from salmon fishing: implications for economic evaluation. *Land Economics* 57(2):181–194.
- Discusses how the maximum sustained yield model fails to take into account cultural factors and fails to recognize the ways in which "common property institutions" deal with open access problems. Using salmon fishing as an example, this paper examines the "satisfaction bonus" and its implications for fishery management.
193. Smith, C. L. 1986. The life cycle of fisheries. *Fisheries* 11(4):20–25.
- Uses a biological metaphor to discuss the life cycle of fisheries. As resources become scarcer, the value of fisheries moves from food production to recreation to aesthetics, and management becomes more stringent.
194. Smith, C. L. 1990. Resource scarcity and inequality in the distribution of the catch. *North American Journal of Fisheries Management* 10(3):269–278.
- Examines the effects of limited stocks and restrictive management policies on catch distribution. Fishery management rules that apply equally to each participant in the fishery result in inequitable catch distributions, where a few fishers are very successful, while most others are left with small shares of the resource.

195. Smith, C. L., and S. Hanna. 1990. Measuring fleet capacity and capacity utilization. *Canadian Journal of Fisheries and Aquatic Sciences* 47:2085–2091.
- Discusses the importance to managers of understanding fleet capacity, using the Oregon bottom trawl fishery as an example. Controlling fleet capacity requires addressing the number and size of vessels, their technical efficiency, and the time commitment of fishers.
196. Smith, C. L., and S. Hanna. 1993. Occupation and community as determinants of fishing behaviors. *Human Organization* 52(3):299–303.
- Discusses how community factors affect the behaviors of fishers. Community studies suggest the inclusion of fishing “communities of interest” in management planning. Occupational analyses indicate how fishing differs from other activities and how there is variation among fishing activities.
197. Smith, F. J. 1970. *Some Characteristics of Oregon Fishermen*. Corvallis, OR: Oregon State University Sea Grant, Extension Marine Advisory Program, Commercial Fishing Publication No. 12.
- Gives demographic characteristics of commercial fishers from 1968 to 1969.
198. Smith, F. J. 1978. *Socio-Economics of the Idaho, Washington, Oregon and California Coho and Chinook Salmon Industry*. Corvallis, OR: Department of Agricultural and Resource Economics, Oregon State University.
- Comprehensive, coastwide study of salmon fishers and communities. Detailed coverage of the socioeconomic aspects of salmon fishing along the Pacific Coast at the time the Magnuson Act was introduced.
199. Smith, F. J. 1978. *What Are Salmon Worth?* Publication no. SG 48. Corvallis, OR: Oregon State University Extension Marine Advisory Program.
- Uses nontechnical language to explain several studies on the worth of salmon. Reviews the reasons for researching the value of salmon, explains various valuation methods, and reviews existing studies.
200. Smith, S. 1995. Social implications of changes in fisheries regulations for commercial fishing families. *Fisheries* 20(7):24–26.
- Discusses how the Florida net ban affected fishing communities.
201. Spurlock, C. P. 1940. A history of the salmon industry in the Pacific Northwest. Master's thesis, University of Oregon.
- Talks about the role of salmon fishing in a mixed extractive economy.
202. Squires, D., and D. D. Huppert. 1988. *Measuring Harvest Capacity in the Pacific Coast Groundfish Fleet*. La Jolla: National Marine Fisheries Service, Southwest Fisheries Center Administrative Report LJ-88-24.
- Explores the relationship between vessel size and groundfish landings in the 1986 groundfish fishery. Uses multiple regression equations to assess the importance of vessel size and other factors in explaining landings and to predict the amount of groundfish landed per vessel.

203. Steen, H. K. 1984. *History of Sustained-Yield Forestry: A Symposium*. Western Forestry Center, Portland, OR. Santa Cruz, CA: Forest History Society.
- Proceedings of a 1983 symposium on sustained yield forestry. Includes history of the sustained yield concept, case studies, social dimensions, and examples from around the world, including an example from classical Greece.
204. Stephenson, G. O. 1980. "Pushing for the highline": the diffusion of innovations in the Oregon otter trawl fishery. Master's thesis, Oregon State University.
- Discusses the characteristics of innovators and innovations in the otter trawl industry. Compares the characteristics of the trawl fleets in Coos Bay, Newport, and Astoria.
205. Stuart, D. D. 1993. *Washington Commercial Salmon Industry Long Range Business Plan*. Seattle: Salmon For Washington.
- Presents a detailed plan for the involvement of the Washington commercial salmon industry in the state's economy, environment, and culture.
206. Swindell, E.G., Jr. 1975. Reprint. *Report on Source, Nature, and Extent of the Fishing, Hunting and Miscellaneous Related Rights of Certain Indian Tribes in Washington and Oregon, Together with Affidavits Showing Locations of a Number of Usual and Accustomed Fishing Grounds and Stations*. Portland, OR: U.S. Department of the Interior, Bureau of Indian Affairs, Branch of Land Services. Original edition, Los Angeles: United States Department of the Interior, Office of Indian Affairs, Division of Forestry and Grazing, 1942.
- Contains information about tribal fishing places and techniques. Includes treaty council minutes and digest of treaty provisions.

T-U-V

207. Taylor, J. E. 1996. Making salmon: economy, culture, and science in the Oregon fisheries, precontact to 1960. Ph.D. diss., University of Washington.
- Examines primary documents from the National Archives, Smithsonian, and regional archives to explore the context of salmon decline and the development of management from precontact periods to 1960. Emphasizes the role of artificial propagation as a tool of salmon management and discusses the inherent biases of policies that are purportedly based on science.
208. The Research Group. 1997. *Economic Assessment of Oregon's Groundfish Fisheries and the Impacts from Proposed Management Measures in 1998*. Newport, OR: Oregon Coastal Zone Management Association.
- Predicts the consequences in terms of employment and income of reductions proposed for the Oregon groundfish fisheries.
209. U.S. Superintendent of Indian Affairs, Oregon Territory. 1855. *A True Copy of the Record of the Official Proceedings at the Council in the Walla Walla Valley, Held Jointly by Isaac I. Stevens, Governor, & Superintendent, Washington Territory and Joel Palmer Superintendent of Indian Affairs, Oregon Territory on the Part of the United States with the Tribes of Indians Named in the Treaties Made at the Council, June 11, 1855*.
- Provides text on the issues raised by the tribes at the treaty negotiations at Walla Walla as the tribes negotiated for their fishing rights and a place for the Umatilla. Shows the attitude of U.S. treaty makers toward tribal peoples. A treaty transcript is also found in

A. P. Slickpoo, Sr., and D. E. Walker, Jr., 1973, *Noon Nee-Me-Poo: Culture and History of the Nez Perces*, Lapwai, ID: Nez Perce Tribe of Idaho.

210. Vokac, D. *The Great Towns of the Pacific Northwest*. 1987. West Press, San Diego.

A popular guide to Oregon and Washington, focusing on coastal communities. Succinct descriptions of coastal towns and attractions.

W-X-Y-Z

211. Wilen, J. E., T.-N. Chen, and F. Homans. 1991. Fishermen and labor markets: participation, earnings, and alternatives in Pacific coast fisheries. Prepared for the National Marine Fisheries Service, Southwest Fisheries Center, Contract No. 50-ABNF-6-0016.

Summarizes a study of labor participation and choices by commercial fishers in California. Little is known about fishing as an occupation and as an alternative to nonfishing jobs; this report aims at describing the nature of fishing as an employment alternative on the Pacific Coast.

212. Wilson, J. A., J. M. Acheson, M. Metcalfe, and P. Kleban. 1994. Chaos, complexity and community management of fisheries. *Marine policy* 18(4):291–305.

Asserts that difficulties in fisheries management based on stock assessments are due to the inherently chaotic nature of fisheries. Argues that management must address the relatively stable aspects of fisheries, such as habitat and basic biology. This attention to detail calls for a layered management structure and is suitable for a decentralized, community-based management approach. Reviews anthropological literature describing such approaches.

213. Yomans, R., W. Rompa, and E. Ives. 1977. *The Tillamook County Economy: A Working Model for Evaluating Economic Change*. Corvallis, OR: Oregon State University Agricultural Experiment Station Special Report 473.

An economic input-output model designed for the Tillamook County economy.

214. Young, M. D., and B. J. McCay. 1995. Building equity, stewardship, and resilience into market-based property-rights systems. In *Property Rights and the Environment: Social and Ecological Issues*. S. Hanna and M. Munasinghe, eds. Pp. 87–102. Washington, D.C.: The World Bank.

Evaluates market-based property rights systems, focusing on equity, resiliency, and stewardship. Offers suggestions about how these criteria can be built into the design of management schemes.

215. Zvonkovic, A., T. Trospen, and M. Manoogian-O'Dell. 1996. *Connecting with Fathers at Sea*. Corvallis, OR: Oregon Sea Grant publication ORESU-G-96-005.

Commercial fishing can take fathers away from their families for long periods and poses a challenge to fishing families with young and growing children who may miss out on some of the special connections children need with their parents. Drawing on ideas from fishing families and the authors' backgrounds in human development and family science, this publication offers practical advice for seafaring fathers who wish to forge strong bonds with their children.

Periodicals

Cascadia Times. 25-6 Northwest 23rd Place, Suite 406, Portland, OR 97210. (503) 223-9036.
cascadia.times.org/

Columbia River Gillnetter. PO Box 511, Astoria, OR 97103. (503) 325-2507.

Coos Bay World. PO Box 1840, Coos Bay, OR 97420. (541) 269-1222. theworld@ucinet.com

Curry Coastal Pilot (Brookings). PO Box 700, Brookings, OR 97415. (541) 469-3123.
www.currypilot.com/

Curry County Reporter (Gold Beach). PO Box 766, Gold Beach, OR 97444. (541) 247-6643.
www.harborside.com/home/r/reporter/

Daily Astorian. 949 Exchange St., PO Box 210, Astoria, OR 97103. (800) 781-3211.
www.dailyastorian.com

Fisheries. American Fisheries Society, 5410 Grosvenor Lane, Suite 110, Bethesda, MD 20814-2199. (301) 897-8616. www.fisheries.org/

The High Country News. PO Box 1090, Paonia, CO 81428. (800) 905-1155. www.hcn.org/index.html

Newport News-Times. 831 NE Avery, Newport, OR 97365. (541) 265-8571.
www.newportnewstimes.com

National Fisherman. PO Box 2039, Marion, OH 43305-2039. (614)382-5866.
www.nationalfisherman.com/

Northwest Energy News. Northwest Power Planning Council, 851 SW Sixth Ave., Suite 1100, Portland, OR 97204. (800) 222-3355. www.nwppc.org

The Oregonian. 1320 SW Broadway, Portland OR 97201. (503) 221-8327.
www.oregonlive.com/oregonian/

Pacific Fishing. 1515 NW 57th St., Seattle, WA 98107. (206) 789-5333.

PCFFA Friday. Pacific Coast Federation of Fishermen's Associations, PO Box 29910, San Francisco, CA 94129-0910. (415) 561-5080. www.pond.net/~pcffa.

Port Orford Today. 832 Highway 101, Box 49, Port Orford, OR 97465. (541) 332-6565.
www.harborside.com/funzone/dfz-pot.htm

Tillamook Headlight-Herald. 1908 Second St., Tillamook, OR 97141. (503) 842-7535.
www.orcoastnews.com/headlight

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