

**Oregon Coastal Residents' Attitudes on
Community Participation in Fisheries Management**

by

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A Research Report

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CHAPTER 1

INTRODUCTION

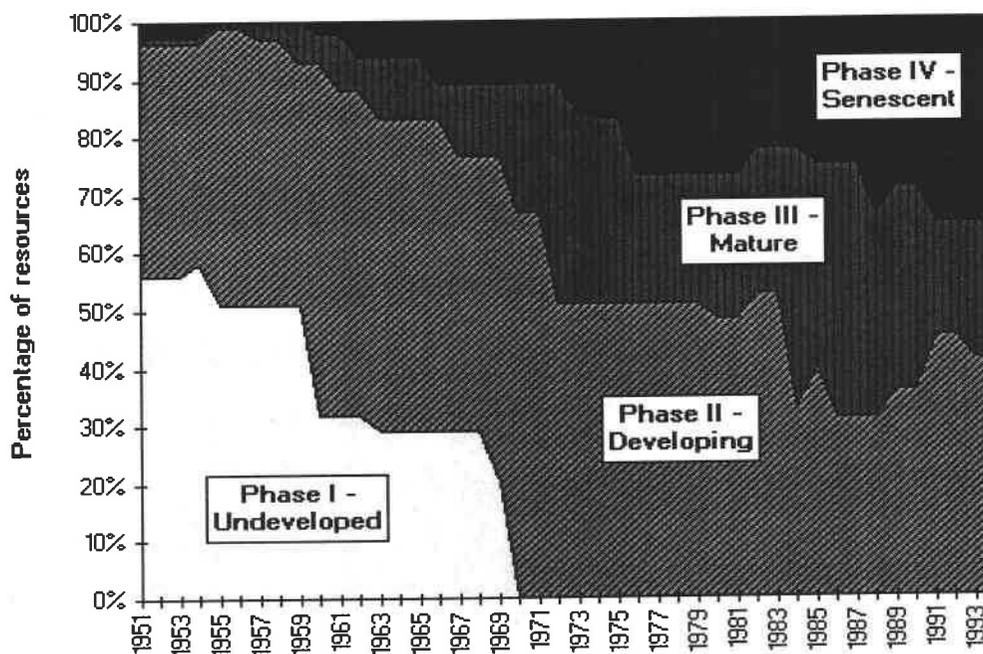
I believe that the cod fishery, the herring fishery, the pilchard fishery, the mackerel fishery, and probably all the great sea-fisheries are inexhaustible; that is to say that nothing we do can seriously affect the numbers of fish (Huxley 1883 in McGoodwin 1990: 66).

Natural resource management is continually evolving, with managers striving to balance the conservation, economic, and social aspects of natural resource use within a very political arena. Fishery management is no different. The above quote, made by Thomas Huxley more than a century ago, contrasts greatly with what fishery scientists predict for the future of marine fisheries.

Although a few fisheries experts are optimistic that the world's annual fish catch may eventually stabilize at around 100 million tons, they also stress that to reach that goal we will have to develop better means of environmental protection, as well as more effective means of fisheries management. If we do not, there is every likelihood that the world's total catch may soon begin to decline, and some stocks will eventually be wiped out permanently (McGoodwin 1990: 2).

As Figure 1.1 shows, sixty percent of the world's fishery resources are mature or senescent and in urgent need of management. An analysis conducted in 1994 of fish stocks for which assessment data were available reported that 44% of stocks were intensively or fully exploited, 16% were overfished, six percent were depleted, and three percent slowly recovering. All in all, 69% of stocks required urgent management action (Garcia and Newton 1994 in Grainger and Garcia 1996). The National Marine Fisheries Service has classified 36% of U.S. fisheries as overutilized and 44% as fully utilized. Because of overfishing, U.S. fisheries are only producing 60% of their estimated long-term potential yield (H. John Heinz Center for Science, Economics and the Environment 1998).

Figure 1.1
Percentage of Major Marine Fish Resources in Various
Phases of Fishery Development
(FAO 1997)



As harvesting pressure on fishery resources increases, and as we fall prey to Garret Hardin's "tragedy of the commons," governments become ever more involved in managing the resource, often resulting in the imposition of strict regulations governing the use of fishery resources. In 1996, the Magnuson-Stevens Fishery Conservation and Management Act (PL 94-265) was reauthorized as the Sustainable Fisheries Act (PL 104-297), providing for stronger conservation measures for U.S. fisheries, including protecting essential fish habitat, reducing overfishing through stricter harvest guidelines, and reducing overcapitalization and bycatch. The management trend in the United States is toward increasing restrictions on fishery effort and landings and in market-based mechanisms, such as individual quotas.

A Change of Thought

In response to increasing government involvement and control in fisheries management, a not-so-new idea of resource management is gaining attention: community management. Community management occurs when resource stakeholders, including fishermen, community members, and the government, work together, each with defined responsibilities, to ensure conservation of the resource and sustainability of fishing communities (Nielsen and Vedsmand 1997). To achieve the goals of the Sustainable Fisheries Act, the U.S. will need to address whether fishing capacity can be reduced and fish populations restored to commercially and ecologically sustainable levels in an equitable manner that considers the interests of resource stakeholders (H. John Heinz III Center for Science, Economics and the Environment 1998). By actively involving resource stakeholders in management decisions, the community management approach may help meet the difficult objectives of resource conservation and sustainability mandated by the Sustainable Fisheries Act.

Community management has been used successfully in many parts of the world. Community management theory, case studies, and experiments are discussed in the fisheries management and marine policy literature, and the applications of community management include studies of developing, artisanal situations to developed, modern, industrial-scale fisheries. Community management is tremendously flexible, and can be designed to work within different geographical, cultural, social, historical, economical, and biological situations. Community management is an evolving area of study and practice. It may not be feasible to use it in every situation, and one successful community management regime is not necessarily transferable to another resource issue. However, it

is a flexible approach to resource management, and its concepts and malleability may give society a tool that will improve our ability to sustainably manage fishery resources.

Fishery management is rife with conflict. Pacific Fishery Management Council meetings, especially ones where quotas are being established, often yield the exchange of harsh words. Determining the biological status of fishery resources and the acceptable biological catch is a scientific question. However, setting quotas, trip limits, and open seasons affects people, families, and communities, and can become very emotional.

Although fishermen and fishery managers share a concern for resource sustainability and know they must work together, differences in their social, economic, cultural, and educational backgrounds may overshadow their similarities (McGoodwin 1990).

Distrust exists between fishery managers and fishermen. In the extreme, fishermen believe that managers lack a real world understanding of 'what's going on out there,' and blindly try one management scheme after another, unconcerned about the impact they are having on the fishermen, their families, and their communities.

At best, many fishers perceive fisheries scientists and managers as meddling people with whom they must cooperate; at worst, they see them as arrogant and insensitive bureaucrats who have the power to implement arbitrary and decidedly prejudicial fisheries regulations. Moreover, while environmental deterioration may in fact be the principal problem in certain fisheries, scientists and fisheries managers, unable to do much to control the environment, may inordinately focus instead on what they *can* control - the fishing effort (McGoodwin 1990: 77).

On the other hand, managers believe fishermen are myopic, with a limited sense of resource constraints or the damage caused by overexploitation. Based on his experiences at fisheries management council meetings, McGoodwin (1990: 82) describes a common scenario:

After the [council] meeting adjourns for the day, informal meetings often take place...and often it is here that the recommended changes in management policy

are hammered out. Sometimes, depending on who is present, one overhears patronizing remarks about the fishermen who earlier testified - his misunderstanding of marine biology, his ignorance of the law, the narrowness of his point of view, and so forth. Especially when those present in the room are mainly from business, government, and scientific and academic institutions, the conversation may turn away from the complex human problems the fishermen referred to and focus instead on the more abstract matters - what the Gordon-Schaefer curves show, for example, or how the ratio of productivity to the level of capitalization in the fleet is deteriorating.

The different points of view and frustrations that fishermen and fishery managers feel with one another make listening and cooperating difficult. The misunderstanding between fishermen and fishery managers is not aided by the difficulty in changing established bureaucratic systems, such as the fishery management council system, and engrained ideas about "correct" fishery management (McGoodwin 1990).

Fishermen are an independent and diverse group of people, and the nature of their work makes it costly and difficult to monitor their at-sea activities. In 1985, approximately 60% of expenses for the Magnuson-Stevens Act implementation was for enforcement (Sutinen and Hennessey 1987). Often, compliance with regulations is viewed as a function of the incentives fishermen face when deciding whether or not to comply. If the chance of being caught is high, if the chance of incurring a penalty is high, and if the penalties are large, people are more likely to comply (Sutinen and Hennessey 1987). Instead of focusing on the enforcement aspect of compliance, other people look to the development of the regulation. If the regulations that are developed are understandable and acceptable to most fishermen, they are more likely to comply (Jentoft 1989).

To make regulations effective, it is important to make them credible. The more legitimate the regulations are to fishermen, the more likely it is that they will comply with

the regulations, thereby increasing the regulation's chance of success. Credibility is difficult to establish if fishermen do not believe that their concerns are being heard and considered when resource management decisions are made. To feel included, they must be active participants in the management process.

A Solution?

How can we develop fishery management programs that satisfy biological, socioeconomic and cultural sustainability objectives? Many of the world's fisheries are overfished, currently at or exceeding their long-term sustainability. Many fisheries are overcapitalized, creating economic waste and political pressure to increase harvest levels. Global fishing capacity is estimated to be 30% greater than what is required to catch what is currently being landed (H. John Heinz III Center for Science, Economics and the Environment 1998). In addition to achieving biological and economic sustainability, sustaining the tradition and culture of fishing communities is also important to many people. Community management is one possible solution. For management practices to be accepted, fishermen must believe the program is legitimate and they must be willing participants. In community management, governments do not dictate resource use, but instead resource users and community members cooperate with the government to develop guidelines that meet conservation goals and satisfy the needs of the stakeholders.

The purpose of the research project leading to this paper was to determine if a community management approach to fishery management would be feasible in Oregon. The basis for answering this question was a survey of residents in Oregon's eleven incorporated fishing port communities. One component of the survey instrument

included questions about commercial fishing, which were designed to answer two questions:

- 1) Are coastal residents amenable to the concept of community management and would they support a community management approach?
- 2) Who are the people who support community management, and in what ways do they differ from the full surveyed population?

The remainder of this paper is structured as follows:

Chapter 2 reviews the basics of fishery management, including the “tragedy of the commons”, the problems of open access resources, property rights regimes and their use in solving the open access problem, national legislation, and a review of Oregon’s marine commercial fishing industry.

Chapter 3 examines community management, including its theoretical basis in the property rights regime solution to the open access problem, its definition, the benefits of community management, and some basic details about the roles of different participants, and ideas about structuring a community management program.

Chapter 4 reviews the survey area, including regional demographics, survey methodology and distribution, and survey respondent demographics.

Chapter 5 presents survey results, comparing responses from the full survey group and from people who expressed support for community management.

Chapter 6 discusses the survey results and their implications for developing and implementing a community approach to fishery management in Oregon

CHAPTER 2

FISHERY MANAGEMENT

Fishery resources are managed ultimately for human benefit. The fishery manager's role is to define the specific objectives of management, be they biological, economic, social, or some combination thereof, resolve conflicts between management objectives, and decide how to best achieve those objectives (Hilborn and Walters 1992). Fishery management policies have often attempted to balance biological sustainability with resource use, the latter of which is primarily an economic and social issue (Buck 1995). The predication is that such policies are based on the best scientific assessment of the resource. However, social and political pressures often underlie the management process and determine the ultimate allocation of fishery resources (Smith and Jepson 1993).

Another important aspect of fishery management is that it needs to be legitimate in the eyes of the resource users and flexible to changing biological, environmental, economic, and social situations.

Fishery management requires the compliance of resource users as well as those excluded from use. Compliance, in turn, hinges on the extent to which the system of regulations is perceived to be legitimate, derived in a fair process, and implemented with an acceptable distribution of outcomes. To be legitimate, a management organization, the procedures by which it functions, the content of its regulations, the method of enforcement, and the distribution of its outcomes must all be perceived to be fair (Jentoft 1989 in Hanna 1998: S173).

Without acceptance by resource users, it is likely that the management process will be conflict-laden, managers and users will not trust each other, and change to the

management program will be difficult. Similarly, management should be flexible enough to deal with change, but must be able to do so without harming its legitimacy.

In several dimensions, the requirements for adaptability to promote ecosystem resilience are in opposition to requirements for reducing uncertainty, promoting efficiency, and maintaining legitimacy. In theory, the ideal institution is adaptively efficient (North 1992 in Hanna 1998)...In application, fishery management institutions are typically rigid in form. Because of the need to establish a formal process and define the "rules of the game," they are constructed with an emphasis on predictability and transparency for users and on the careful consideration of scientific information, and they are often cumbersome in operation (Hanna 1998: S173).

Fishery managers, therefore, are dealing with more than just defining management objectives. They must also develop management programs that are legitimate in the eyes of resource users and flexible enough to adapt to environmental and socioeconomic changes.

The purpose of this chapter is to provide background information about fishery management and to develop an understanding of the role community management could play in fishery management. Any discussion of fishery management would be incomplete without mention of Garret Hardin's Tragedy of the Commons, so this chapter begins with a review of the open access problem of fishery resources and an illustration of the problem using the Schaefer surplus-production model. Second, is a discussion of the use of property rights to solve the open access problem. After this theoretical view of fishery management, is a brief review of pertinent national legislation, focusing on aspects relevant to community management, and Oregon's commercial fishing industry.

2.1 The Open Access Problem and the Tragedy of the Commons

The "tragedy of the commons" is a metaphor commonly used to describe the cause of overfishing. Garret Hardin popularized this idea in 1968 in a paper written for the journal *Science*. He wrote:

Picture a pasture open to all...the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd...the conclusion reached by each and every rational herdsman sharing a commons. Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit - in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom of the commons brings ruin to all (Hardin 1968: 1245).

The "tragedy of the commons" can be applied to fisheries where each resource user continues to increase effort in the fishery, regardless of the damage his or her actions cause to the resource and to other resource users. Open access resources are generally defined by their nonexclusivity and subtractability. Open access resources are nonexclusive because limiting access is prohibitively high, if not impossible, and subtractable because one individual's action decreases what is available to others (Pinkerton 1994). The end result is degradation of the resource and the loss of benefits to all users (Kuperan and Abdullah 1994). According to Hardin, the solution to the problem is "mutual coercion mutually agreed upon" with property rights identified as the solution.

The "tragedy of the commons", or more accurately "the tragedy of open access", is that anyone can use the resource, but nobody is responsible for its upkeep. The result is a resource that is not efficiently utilized - biologically, economically, or socially.

Marine fishery resources are generally considered common property resources, "owned" by the general public, but not exclusively controlled by any one individual. Inefficient activities, such as overexploitation of the biological resource, overcapitalization in the

fishing industry, and underinvestment in conservation often result. The Schaefer surplus-production model can be used to illustrate the open access problem and why open access leads to a different level of resource use than is socially optimal.

2.1.1 The Schaefer Model¹

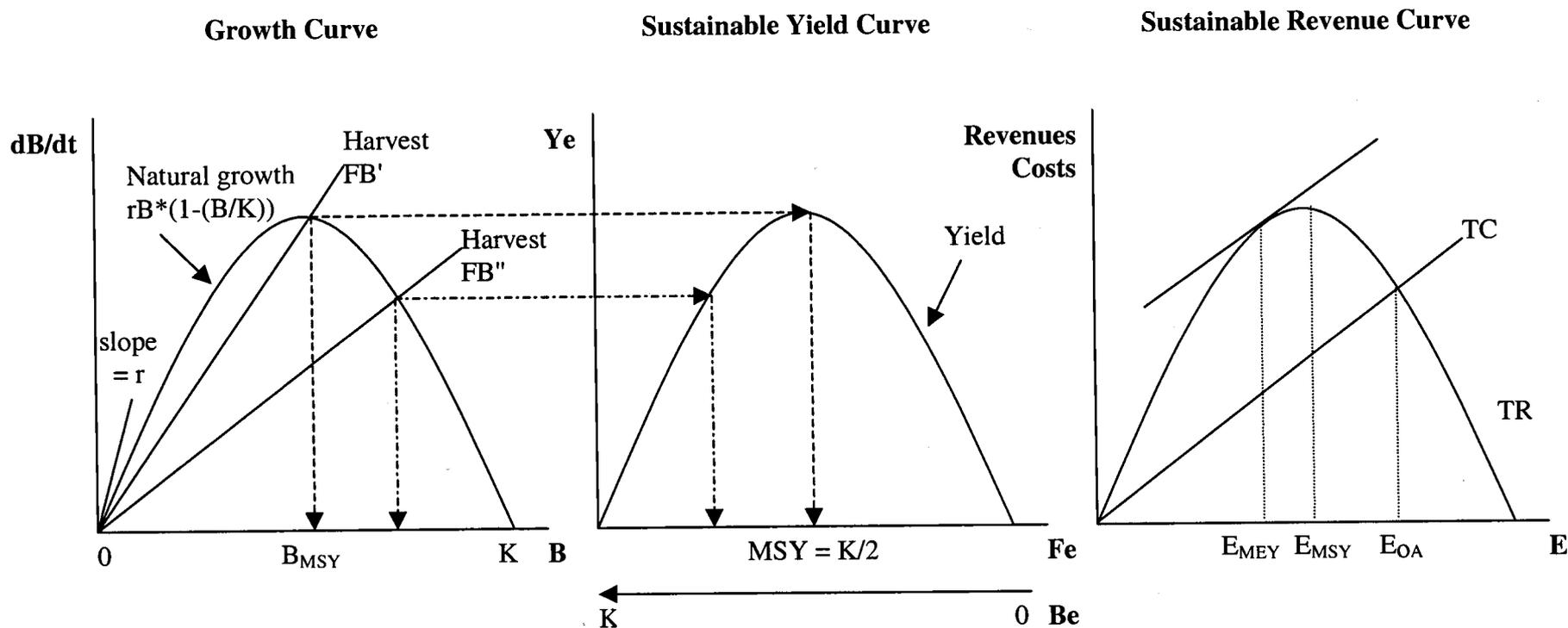
The Schaefer surplus-production model of fishery population dynamics, although simplistic, is often used as the foundation to illustrate the effects of open access resources. Figure 2.1 graphically depicts the concepts discussed in this section. The Schaefer model is based on the logistic growth equation, where new growth of a stock is the difference between the birth rate and the death rate of individuals within a population. The Schaefer model relates the growth of the fish stock (dB/dt) to its intrinsic growth rate (r), carrying capacity (K), stock biomass (B), and fishing mortality (F) by the following relationship:

$$dB/dt = rB[1-(B/K)] - FB$$

The equation states that the change in biomass is a function of the natural growth of the stock minus the amount of fish harvested. The first graph in Figure 2.1, the growth curve, depicts this equation. The growth curve is a parabola that passes through the points $dB/dt = 0$, $B = 0$, and $B = K$. The curve begins at the origin where biomass and the growth rate are zero, peaks at the maximum growth rate of the population, and again meets the x-axis where the biomass of the stock has reached the carrying capacity of the environment, and again the growth rate is zero.

¹ The information from this section, although available in a variety of fishery literature, primarily came from personal communication (classes) with David Sampson (1997) and Bruce Rettig (1997).

Figure 2.1
Growth Curve, Sustainable Yield Curve, and Sustainable Revenue Curve



Key:
 dB/dt = growth of fish stock
 B = biomass
 r = intrinsic growth rate
 K = carrying capacity
 F = instantaneous fishing mortality

Ye = equilibrium yield
 Fe = instantaneous fishing mortality
 Be = equilibrium biomass
 MSY = maximum sustainable yield

E = fishing effort
 TR = total revenue
 TC = total cost
 E_{MEY} = maximum economic yield
 E_{MSY} = maximum sustainable yield
 E_{OA} = open access equilibrium

At equilibrium ($dB/dt = 0$) the equation can be rewritten as follows:

$$0 = dB/dt = rB[1-(B/K)] - FB$$

$$FB = rB[1-(B/K)]$$

And, because FB is equivalent to the harvest, or yield (Y) from a stock of fish:

$$Y = rB[1-(B/K)]$$

The graph of equilibrium yield versus equilibrium biomass also traces out a parabola, starting at the origin and ending at the carrying capacity of the fish stock (K). The curve is called a sustainable yield curve because it traces out a locus of points of excess production, or the amount of fish that can be harvested without depleting the stock. The highest point on the curve is the maximum sustainable yield (MSY). The sustainable yield curve can also be used to show the relationship between yield and fishing mortality. This is the relationship shown in the middle graph of Figure 2.1. When fishing mortality (F) equals zero, no yield is obtained from the fishery. As F increases, yield increases up to a point - the maximum sustainable yield. Beyond the MSY, increasing F will not lead to increasing catches, and so the parabola declines. At the point where F equals the intrinsic growth rate of the population, the yield will again be zero. Yield in a fishery can therefore be managed by selecting a target value for F and selecting the appropriate management measures to obtain that level of fishing mortality. Arrows drawn between the growth curve and the sustainable yield curve show the relationship between the growth rate, biomass, fishing mortality, and yield.

The sustainable yield curve can be translated into a sustainable revenue curve by multiplying the yield by the price of fish. The sustainable revenue curve, labeled total revenue (TR) is shown as the last graph in Figure 2.1. Up to the MSY, the yield

increases as fishing mortality increases. Fishing mortality is viewed as a function of the effort used to catch fish, and is described by the following simple relationship:

$$F = q E$$

where q is equal to the catchability coefficient, which is a measure of the effectiveness of the fishing effort, times the fishing effort. The relationship between fishing mortality and effort is somewhat intuitive: as the effort used to catch fish increases, fishing mortality will increase. As fishing mortality increases, yield increases, and as yield increases so does the revenue earned. Of course, once fishing has passed the maximum sustainable yield, effort and fishing mortality can increase, but yield and revenues will decrease.

Effort also influences the cost of fishing. As more effort is put into a fishery to catch fish, the cost of fishing will also increase. It is generally assumed that the cost of fishing rises proportionately with the effort, resulting in a linear and increasing total cost (TC) curve. The TC curve is also shown in Figure 2.1. The relative costs and revenues of fishing determine the amount of effort put into a fishery and the resulting profit, or economic rent, generated. Ideally, the fishing industry would want to collectively fish at the level that would maximize yield (MSY) or profit (MEY). However, in an open access resource situation, this often does not occur. The reason why is explained in the following section.

2.1.2 Socially Optimal versus Open Access Level of Effort²

Economically efficient use of fishery resources occurs when the marginal revenue of harvesting fish equals the marginal cost (Kahn 1995). This corresponds to the point

marked as E_{MEY} in Figure 2.1 and is the level of effort, for the fishery as a whole, that generates the maximum economic yield (MEY), or rent. In theory, if the fishery were privately owned it would be fished at E_{MEY} because that level of effort would maximize the owner's profit. Any additional effort used would actually decrease his or her profit. This is the socially optimal level of fishing effort. Arguably, the MSY may also be a socially desirable level of fishing if society prefers to maximize yield instead of profit. However, in an open access fishery, fishing effort does not stop at E_{MEY} or E_{MSY} . Initially, when demand for the product is low, there may not be a problem. However, as demand increases and price for the product increases, people realize that profit can be earned by fishing, people enter the fishery, and total effort increases. As long as profit is being earned, fishermen continue to increase effort and catch more fish. People stop entering the fishery when all rents are dissipated, or when total revenue equals total cost, marked E_{OA} in Figure 2.1. This is the level of effort that results under open access conditions. Rents are considered "dissipated" because the profit that could have been earned by the fishery, and in theory invested in other projects, has been spent on purchasing more boats, gear, etc. than is needed to catch the amount of fish being harvested. Such a fishery is overcapitalized.

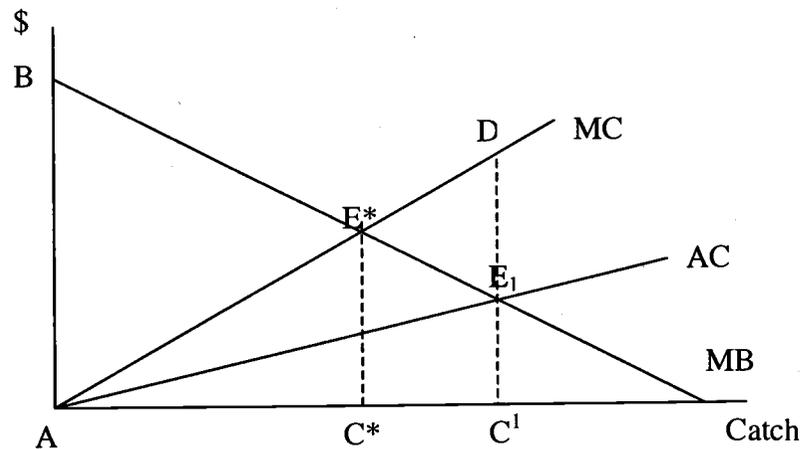
Open access resources lead to dissipation of rent and inefficient resource use.

Each individual fisherman makes business decisions by comparing their average cost and average benefit from a given unit of effort instead of the marginal cost and marginal benefit comparison that society would prefer (Kahn 1995). The economic conditions that

² Due to space limitations I only reviewed the static optimal conditions, which are those most commonly seen in fishery economics. However, fishery biologists and economists are very aware of the dynamic nature of fishery resources and the limitations of the static models.

exist in open access fisheries cut into the benefits that fishermen and fishing dependent communities might receive from the resource (Pinkerton 1994). Figure 2.2 diagrams the social benefits that are lost in an open access situation. In an efficient situation, such as if the fishery was privately owned, fishermen would equate their marginal costs and marginal benefits, and catch C^* fish. The net benefit to society is area ABE^* , the maximum sum of consumer and producer surplus. In an open access situation, fishermen instead make decisions on the average cost, and so select to fish at C^1 . This results in a social loss of area E^*DE_1 , which must be subtracted from area ABE^* , yielding a much smaller net social benefit (Kahn 1995).

Figure 2.2
Maximizing Social Welfare
 (Kahn 1995)



Assuming that fisheries are open access and that fishermen will behave as described above, fishery managers have historically used command-and-control regulations to influence the location of E_{OA} , and thereby influence the amount of fishing effort, and resulting fishing mortality, that fishermen select. Managers can do this by changing the

relative costs or revenues that fishermen experience. For example, if the government institutes a tax on the amount of effort (e.g., tax per unit of horsepower in a boat), the total cost curve in Figure 2.1 will shift up by the amount of the tax. If the total revenue curve stays the same, the total cost curve will intersect the total revenue curve to the left of the E_{OA} . Ideally, it would be possible for managers to select the perfect tax and achieve E_{MSY} or E_{MEY} . Measures such as reducing fishing power, limiting fishing trips, establishing fishing seasons, closing areas, restricting gear use, setting quotas, establishing landing restrictions (size, sex), taxing input, and taxing landings are techniques that have been used to influence the costs and revenues, and resulting effort put into fishing. However, generally these methods are ineffective in heavily overcapitalized fisheries, and implementation and enforcement can be costly and difficult (Rettig 1997).

As mentioned earlier, fishery economics theory states that a privately owned resource would be utilized at an efficient level. Regulations have been used to attempt to achieve E_{MEY} or E_{MSY} . However, it can be difficult to control the many and varied factors that go into fishing. Simulating property rights, which is discussed in the next section, are often proposed as the solution to this problem.

2.2 Solving the Open Access Problem

H. Scott Gordon's seminal 1954 article formally introduced the common property problem of the fishery, and fishery managers continue to search for ways that will solve this problem.

From the start it was recognized that fishery problems were related to the absence of individual property rights. Non-exclusiveness of access robbed fishing

operators of the incentive to husband the resource, leading almost invariably to excessive levels of exploitation. The fugitive nature of most fish stocks, together with the multiple resource use of their water habitat, made it usually impractical, if not impossible, to solve the problems by dividing fish stocks into discrete units for which effective property rights would be assigned (Copes 1986: 278).

Many people believe open access fishery problems are related to the absence of individual property rights in fish stocks (Copes 1986), and property rights are viewed by many as the obvious solution to the open access problem.

Property rights are often defined as, "a bundle of entitlements defining the owner's rights, privileges, and limitations for use of the resource" (Tietenberg 1992: 45). The owner of a resource has a strong incentive to use that resource efficiently because by not maximizing profits that owner is losing revenue (Tietenberg 1992). Similarly, an owner of a resource would be willing to invest in improving the resource because any benefits that result are captured entirely by the owner. Tietenberg (1992: 45-47) describes four attributes associated with non-attenuated property rights that result in economic efficiency:

- **Universality.** All resources are privately owned, and all entitlements completely specified.
- **Exclusivity.** All benefits and costs accrued as a result of owning and using the resources should accrue to the owner, and only to the owner, either directly or indirectly by sale to others.
- **Transferability.** All property rights should be transferable from one owner to another in a voluntary exchange.
- **Enforceability.** Property rights should be secure from involuntary seizure or encroachment by others.

These characteristics describe an extreme situation where no restrictions are placed on an owner's rights. However, in reality, some of these characteristics, or components of them, are likely to be attenuated. For example, a private landowner generally faces zoning restrictions on his or her land, so universality is not entirely met. However, the

owner is likely to meet many of the attributes described above. The opposite is the case in open access resource. In such a case, where property rights are weak or nonexistent, few if any of the attributes of economic efficiency are met.

Assigning ownership of an entire fishery to a single individual is not practicable, socially acceptable, or politically desirable. Instead, fishery managers have worked to develop ways that simulate property rights. By assigning property rights, the belief is that fishermen will behave as if they have some stake in the sustainability of the resource, and therefore make efficient decisions and independently control the overall level of effort put into the fishery. This differs from open access, where fishermen have the incentive to expand their capacity to catch as much of the quota as possible, and where fishermen continue fishing as long as the total cost is less than the total revenue (Anderson 1986).

Hanna, Folke, and Maler (1996) describe three property rights structures that could correct for the open access situation that leads to the tragedy of the commons. Privatizing the rights to use the resource is the first possible alternative. The assumption is that a private owner will use the resource in such a way to maximize returns over time. Property rights could also be specified as community property. The community would collectively decide how to use the resource to maintain its productivity, and also monitor and enforce resource use. The third structure is to assign ownership to the state, with a state management agency responsible for meeting the social goals of resource use. Table 1, from Hanna, Folke, and Maler (1996), summarizes the three types of property rights regimes.

Table 2.1
Property Rights Regimes
(Hanna, Folke, and Maler 1996)

Regime Type	Owner	Owner Rights	Owner Duties
Private property	individual	socially acceptable uses; control of access	avoidance of socially unacceptable uses
Common property	collective	exclusion of non-owners	maintenance; constrain rates of use
State property	citizens	determine rules	maintain social objectives
Open access (non-property)	none	capture	none

Many commercial fisheries are open access resources and property rights are basically nonexistent. Regulations, such as catch quotas, gear restrictions, and season and area closures, are often used to ensure resource sustainability but have met with limited success (Kuperan and Abdullah 1994).

The general tendency is to reduce greatly the authority of local communities in the management of the coastal resources through legislation and the establishment of institutions that provide a minimal role for fishermen to participate in the management of the resource. The general outcome has been a greater difficulty on the part of government agencies in communicating to coastal fishing communities the need for management of coastal resources and the benefits that may arise from coastal resource management (Kuperan and Abdullah 1994: 309).

In these types of situations fishermen are often not formally involved in the development and implementation of management, creating an adversarial relationship between fishermen and fishery managers. "Excluded from the decision-making process and often not appreciating the need for particular management measures, fishermen will attempt to circumvent them in order to maximize catches and, in turn, revenue. They will do this even though penalties exist for infringements (Doulman 1993: 112)."

Alternatively, fisheries managers have tried simulating private property rights to encourage fishermen to believe they have a stake in the resource and therefore to use it wisely. Individual quotas (IQs) are a popular approach to assigning property rights to

individual fishermen. Individuals are allocated a portion of the total allowable catch, which becomes theirs to do with as they will. There are many pros and cons to IQs, but one of the major advantages is that the owners are motivated to harvest their allowable catch as efficiently as possible because they reap the benefits of their efficiency (Anderson 1986). On the other side of the argument, many fishermen fear that the rights to fish will end up in the hands of a few and traditional users will be excluded from the fishery, causing economic devastation in fishing communities and a loss of a valued tradition. Often managers try a combination of approaches, such as partial property rights supplemented by mechanisms that ensure an appropriate allocation of the resource, modified by concerns over distributional equity (Copes 1986).

Hardin, and many fishery managers, do not consider community-based forms of management viable. However, common property theorists argue that community management could solve, at least in part, the problems of open access resources. Even if the government requires licenses and enforces the regulations, cheating is relatively easy. However, in a community management system, the members of the community are involved in developing the regulations and have a stake in their successful implementation.

When a locally based regime has gained widespread community support and legitimacy, and there is a sense of ownership and responsibility for the resource among a known group of users, the entire community can become part of the eyes and ears of the local regime's enforcement (Pinkerton 1994: 2366).

Community management also has more flexibility than government management to respond to local-level variability and exert more local control over the activities of the community's members.

The willingness of fishermen to obey the rules appears to be related to their ability to monitor each others' activity to ensure that everybody else is obeying the rules, as well as the degree of legitimacy of the regime (Pinkerton 1994: 2366).

The ability to have a hand in regulatory development and have some control over who has access to a resource and ensure that nobody is taking advantage of the other community members lends legitimacy to the process and makes community management a potentially very effective form of fishery management.

When the fishing regulations are issued or validated by a locally based regime, in consultation with government and following principles of sustainable yield, and when a diversity of local people are knowledgeable about the conservation imperative of regulations and able to observe each others' behavior, regulations will be more easily implemented (Pinkerton 1994: 2366).

The last section of this paper will discuss national legislation, focusing on aspects particularly relevant to community management. Chapter 3 will delve into the theoretical background and application of community management principles in more detail.

2.3 National Legislation

By the mid-1970's, fishery resources around the world were under intense fishing pressure, and efforts to slow the depletion of fish stocks had not been successful. In an attempt to mitigate the depletion of fishery resources, many countries extended exclusive fisheries jurisdictions, taking control of contiguous offshore fishery resources. In 1976 the United States passed the Magnuson Fishery Conservation and Management Act (MFCMA or Magnuson Act), extending fisheries jurisdiction to 200 nautical miles offshore (Christie 1994). The Magnuson Act, later amended and renamed the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA or Magnuson-Stevens Act) (PL 94-295), provides for the use, conservation, and management of fishery

resources within the 200 nautical mile U.S. Exclusive Economic Zone (EEZ) (Fisheries of the United States 1996).

The Magnuson-Stevens Act established eight regional fishery management councils, with responsibilities for creating fishery management plans (FMPs) and promulgating regulations through the U.S. Department of Commerce to enforce the FMPs. The FMPs must conform to National Standards, which require that the FMP management and conservation measures prevent overfishing and assure optimum yield, using the best scientific knowledge available. The National Standards also include requirements about how individual and interrelated stocks of fish shall be managed, for fair and equitable allocation of fishery resources, for the consideration of efficiency, and to minimize cost and unnecessary duplication (PL 94-265 §301).

The Magnuson-Stevens Act was amended by the Sustainable Fisheries Act (SFA) (PL 104-297) on October 11, 1996. The SFA made major changes to the Magnuson-Stevens Act, including specifying science, management, and conservation actions by the National Marine Fisheries Service (NMFS). Key provisions of the SFA include preventing and ending overfishing, rebuilding depleted stocks, reducing bycatch and unintended mortality, designating and conserving essential fish habitat, reforming the FMP process, reducing conflict-of-interest in the regional councils, and establishing user fees (SFA Update June 1997).

The SFA also established three new National Standards, one of which mandates consideration of the impact of fishery management and conservation decisions on fishing communities. The SFA defines fishing communities as:

A community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and

includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community (PL 104-297 §102).

New National Standard 8 concerns fishing communities, and states that:

Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities (PL 104-297 §106).

The new National Standards show a growing awareness of the role of communities in fishery management. Community management would allow increased community involvement in fishery management and also make regulations themselves more credible to the fishing community, thereby increasing their likelihood of success.

2.4 Commercial Fishing in Oregon

The popular media in Oregon gives a lot of attention to Oregon's natural resources, especially timber and fish, and the changes in those resources. It would be easy to believe that these are dying industries that no longer provide any benefit to communities. There is some truth to these views - logging and fishing are not as prevalent in Oregon's economy as they once were. However, neither are they rapidly disappearing sectors of Oregon economy. Oregon's fishing industry still employs and provides income to many people, and it still provides food for the nation and the world. Figures 2.3 and 2.4 show historical trends in commercial fishing landings in Oregon from 1950 through 1997. Figure 2.3 shows total landings and value of landings, Figure 2.4 shows landings by species. Both figures show the increasing trend in landings in Oregon. Coincident with the increased landings is also an increase in the value. The figures also

show the cyclical nature of the fishing industry. However, even though landings have continued to increase, there is international and national concern that many fisheries are at or near full exploitation, with many overexploited, raising questions about the long-term productivity of these resources.

2.5 Summary

Fishery management has always been influenced by social needs, however, it may be moving in a direction that more actively considers the needs of fishing communities. The Sustainable Fisheries Act specifies that the needs of fishing communities be considered. The implementation of individual transferable quota policies have raised concerns about the effects that privatizing a resource may have on small, fishing-dependent communities. And as always, concerns about whether we are reaching the limits of fishery resources and how to ensure its sustainability lead to discussions for new ways to manage fisheries. This chapter reviewed the standard theoretical approaches to fishery management, including the "tragedy" of open access, attempts at solving this tragedy through regulatory measures and by simulating property rights. These programs have not always been effective, and it is possible that community management - alone or in tandem with more traditional methods - may increase the overall success of fishery management.

Figure 2.3
Commercial Fishery Landings in Oregon
1950-1997
 (NMFS 1998)

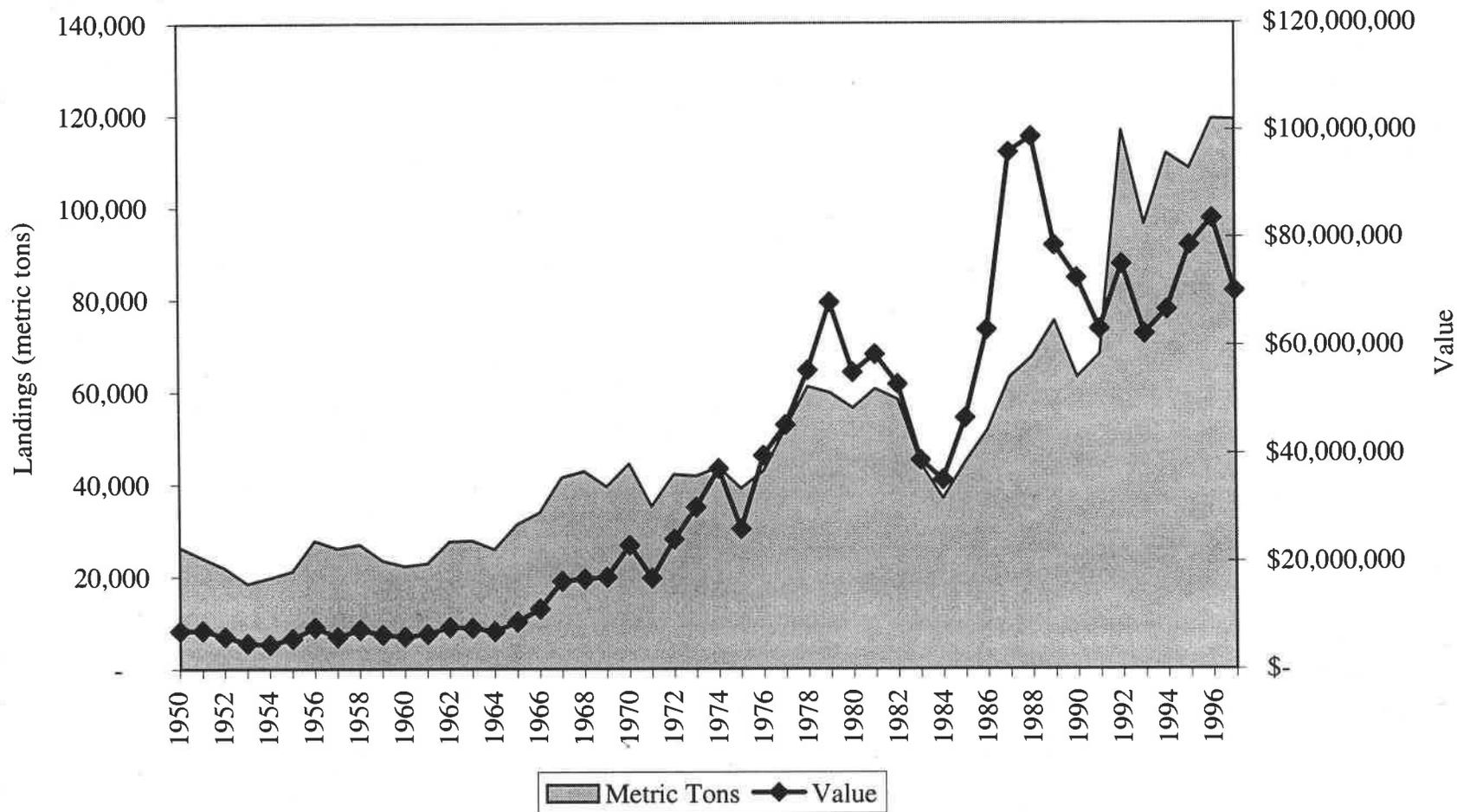
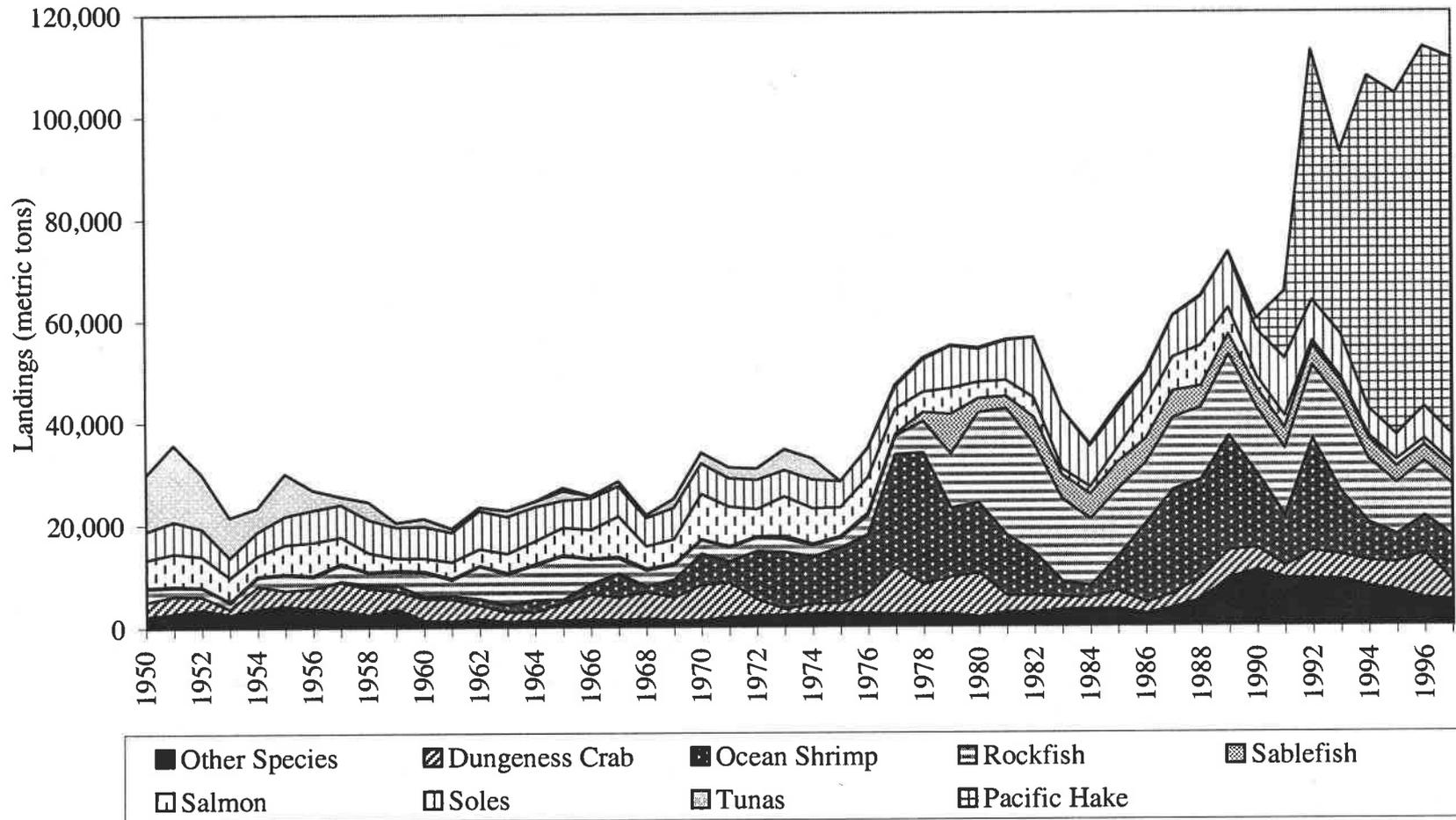


Figure 2.4
Commercial Fishery Landings in Oregon by Species
1950-1997
 (NMFS 1998)



CHAPTER 3

COMMUNITY MANAGEMENT

There are no simple technical solutions to fishery management problems. The industry is complex, the environment is constantly changing, and our ability to assess the resource is limited. So far, we have not come up with a management solution that can integrate the different interests and objectives of management (Jentoft 1989).

What looks good in theory may be impractical in reality. What is 'rational' at the societal level may be intolerable at the local level. What is efficient from an economic perspective may be socially and culturally harmful. Also, what makes sense in biological terms may be unwise in social and economic terms. All things considered, a maximum sustainable yield is not necessarily the optimal yield (Jentoft and McCay 1995: 227).

Management must deal with biological, social, economic, and political issues.

Multidisciplinary knowledge is needed to address each of these issues and develop effective management measures. And, the success of any regulation is very much dependent on industry acceptance (Jentoft and McCay 1995).

Three property rights arrangements are available for addressing the tragedy of the commons dilemma: private property, state property, and communal property. Hardin's implication was that open access resources would be destroyed unless they were privatized or strictly regulated. However, Evelyn Pinkerton (1994) notes that privatization has been "rejected as unpalatable" by many, with state regulation seen as the only possible alternative. Unfortunately, the current government, regulatory, top-down approach to management does not seem to be solving the problem – fisheries around the world are overfished and overcapitalized. Privatizing fishery resources also receives criticism. Many people argue that, because the ocean and resources within it are public

resources, at least some of the economic rent should return to the community (Young and McCay 1995). Individual quotas (IQs) are the closest managers have come to turning a public resource into private property, and although IQs may make commercial fishing more efficient, it may clash with other management goals, such as maintaining traditional fishing communities (Young and McCay 1995). Instituting common property management also makes people nervous, with the "fox in the hen-house" analogy coming to mind to describe what happens when you let fishermen manage a resource for long-term sustainability when economic incentives encourage them to harvest now.

Community management falls within the common property regime, but it is more of an intermediary between common property management and government management (Jentoft 1989). Evelyn Pinkerton (1994: 2367) explains community management as, "8 potential points on a 10-point continuum between state management (at point 1) and self-management (at point 10)." It is the sharing of management responsibility and authority between the government and the community. Community management is also referred to as co-management, cooperatives, partnerships, and community-based management. Some authors distinguish between the various titles, but they all generally refer to management under the common property regime, as discussed in Chapter 2. Community management, community-based management, and cooperatives are generally more associated with autonomous control of resources by local communities, possibly without government inclusion. Co-management and partnerships generally refer to cooperative efforts between government and users. Because of the current management practices, stock status issues, history, and scale of management in the United States and Oregon, it is assumed that a community approach to fishery management in Oregon would take

more of the form of co-management. However, for the purpose of this paper the different terms will be viewed as interchangeable.

This chapter will define and discuss the theoretical basis of community management, review the purpose of community management, its goals and benefits, and the problems of community management. Implementation, structure, and the division of responsibilities are also examined.

3.1 Theoretical Basis and Definition of Community Management

The community management approach to fisheries management falls under the common property regime discussed in Chapter 2 and as explained by Hanna, Folk, and Mahler (1995). Recall, the four types of property rights regimes are: private property, common property, state property, and non-property or open access. Community management, although considered a type of common property, falls between true state property and true common property (Pomeroy and Berkes 1997).

Co-management takes a middle course. It is a meeting point between overall government concerns for efficient resource utilization and protection, and local concerns for equal opportunities, self-determination and self-control. The responsibility for initiating regulations is shared (Jentoft 1989: 144).

Community management approaches have increased in popularity as fishery managers increasingly recognize that effective management requires the cooperation and participation of fishers. There is a growing recognition of the rights of users to be involved in fisheries management, not just as advisors, but as active participants with management responsibilities and authorities. Community management is based on the idea that users have a significant role in the management of fishery resources and should

work with government to define and share management responsibilities to ensure fair and equitable division of the opportunity to fish (Nielsen and Vedsmand 1997).

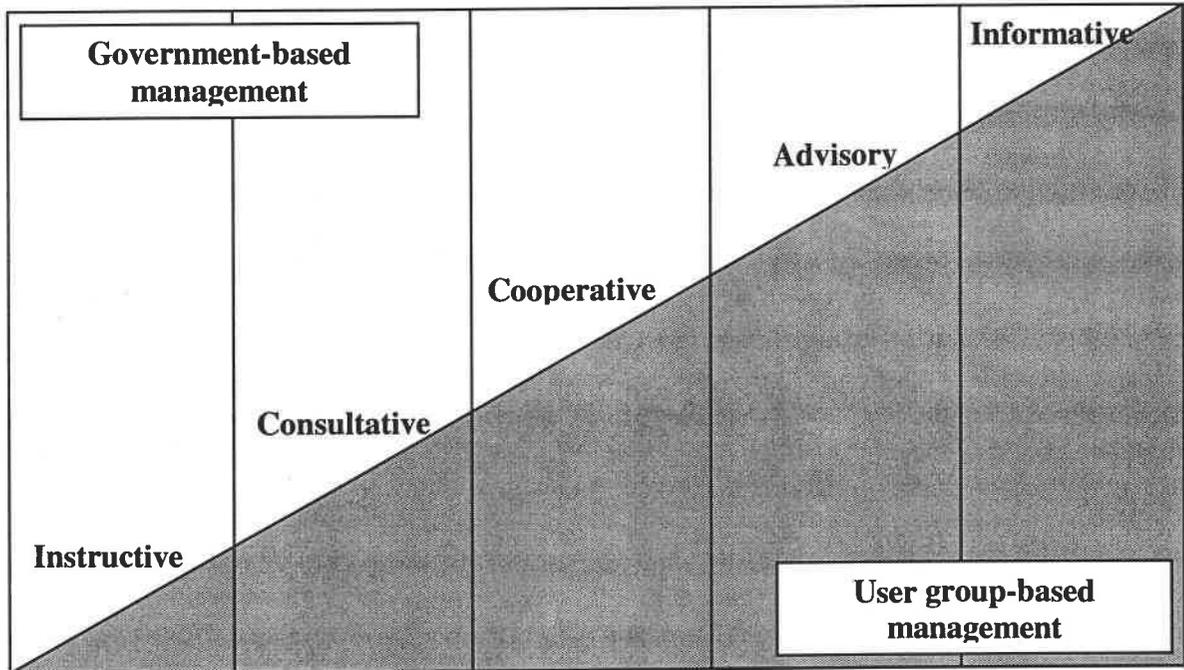
Community management is a way to involve resource users and legitimize their belief of resource management. Local users, with their specialized knowledge, are in partnership with the government, with its ability to provide legislation, enforcement, conflict resolution, and other assistance. And specifically, "it is the complementarity between such local knowledge and scientific knowledge that makes co-management stronger than either community-based management or government management" (Pomeroy and Berkes 1997: 467). Community management is also not limited to a fishermen-government interaction, but can also include community members.

Nielsen and Vedsmand (1997: 278) define community management as:

A dynamic partnership using the capacity and interest of user-groups complemented by the ability of the fisheries administration to provide enabling legislation...is also a means to reorganizing the fisheries management system...an institutional process of integrating and reallocating management responsibilities and competence among participants by sharing the costs derived from fisheries management with the users. Fisheries co-management is based on the following hypothesis. *The involvement and participation of user-groups create incentives for cooperation in order to formulate and implement more efficient, equal and sustainable management schemes which would benefit all parties* [emphasis added].

Community management is not a top-down, strictly defined resource management regime. Instead, it is a flexible approach to fisheries management, with the specifics defined on a case-by-case basis. Sen and Nielsen (1997: 406-407) explain the continuum of community management, as shown in Figure 3.1. Reading left to right, the diagram shows increasing user-group involvement in management.

Figure 3.1
Spectrum of Co-management Arrangements
 (Sen and Nielsen 1996)



Sen and Nielsen identified five major categories of co-management. They are:

- **Instructive:** minimal exchange of information between government and users.
- **Consultative:** mechanisms exist for government to consult with users, but all decisions are made by the government.
- **Cooperative:** government and users cooperate together as equal partners in decision-making.
- **Advisory:** users advise the government of decisions, and the government endorses the decisions.
- **Informative:** government has delegated decision-making authority to user groups who inform the government of their decisions.

As Figure 3.1 shows, co-management covers various partnership arrangements and

degrees of power-sharing and integration of local and centralized management systems.

There is a hierarchy of co-management arrangements from those in which the fishers are merely consulted by the government before regulations are introduced, to those in which

fishers design, implement and enforce laws and regulations with advice and assistance from the government (Pomeroy and Berkes 1997).

3.2 Purpose, Benefits, and Problems of Community Management

The commercial fishing industry is very complex, with variations in biological, environmental, and socioeconomic conditions, as well as in the type of technology used. In response to these variations, fishing operations also vary – by year, season, and place (Jentoft 1989). The tremendous variation makes it very difficult to develop efficient and equitable management that protects fishery resources *and* that fishermen accept. The purpose of community management is to create incentives for cooperation and develop more appropriate, efficient, equitable, and sustainable management programs (Nielsen and Vedsmann 1997; Pomeroy and Berkes 1997). The primary goals of community management are:

- Community-based economic and social development.
- Decentralizing resource management decisions.
- Reducing conflict through a process of participatory democracy (Pomeroy and Berkes 1997: 468).

The remainder of this section will review the benefits created by community management and problems that may be encountered.

3.2.1 Benefits

Jentoft wrote an article in 1989 addressing overarching components of community management. His article, which is based on a review of community management case studies, addresses the general benefits, problems, and conditions for success of community management. Jentoft (1989) identified the primary benefits of community

management as: legitimacy, improved resource information, increased equity, increased flexibility, and a more democratic process. Each benefit is briefly discussed below.

Legitimacy

Many researchers of community management write that effective fishery management requires legitimacy. If fishermen do not support a regulation, they will find ways to bypass the management program, thereby reducing its effectiveness. Legitimacy is, in large part, based on the decision-making process.

The distribution of influence is an organizational matter, and that is basically what co-management is all about. Co-management entails 'mutual coercion, mutually agreed upon by the majority of the people affected.' In contrast, government management is management from the top-down. If the decision-making process is fair and just, which is co-management at its best, the majority rule is more likely to be followed by all (Jentoft 1989: 146).

Involving resource users in the decision-making process increases the legitimacy of the management program in their eyes and improves the quality and effectiveness of the regulations (Jentoft 1989).

Improved resource information

When fishermen are active participants in the management process their local knowledge is more likely to be shared with government scientists and managers, thereby increasing the store of knowledge about the resource being managed. One of the major points of contention between managers and fishermen in the United States is whether the science that managers are using as a basis for their decisions is good. There is a lot of controversy about data collection and stock assessment techniques. Fishermen have more detailed information about the resource-base, and even if it is not 'scientific', at the very least it can supplement government information. Co-management may be able to

increase the amount of information shared between the government and fishermen and reduce conflicts between the two groups regarding data collection (Jentoft 1989).

Increased equity

Government managers are not equipped to make management decisions on a case-by-case basis, and so although their intention is to design equitable management programs, it may be impossible to do so. Fishermen, with their local knowledge of socioeconomic conditions, are better equipped to identify equity considerations and respond to the special needs and interests of individuals, resulting in more equitable regulations (Jentoft 1989).

Increased flexibility

Government agencies are also not equipped to deal with local and seasonal environmental variations. However, for regulations to be fair, that variability should be considered. But, to do so, a great deal of detailed knowledge is required about local circumstances and ecological conditions. Fishermen's organizations, with a more local focus and smaller constituency, can be more flexible and respond to variations (Jentoft 1989).

More democratic process

Fishermen are more active participants in the management process in co-management. The transferring of management responsibility to a more local level should increase the amount of participation by fishermen, resulting in more democratic decisions and a better management program (Jentoft 1989).

Case Studies¹

The benefits, problems, successes, and various structure of community management identified by Jentoft (1989) have been documented in case studies. For example, the Coastal Communities Network (CCN) in Nova Scotia is a co-management organization with members from the fishing industry, municipalities, economic development agencies, and community organizations. The CCN was formed in 1992 in response to the northwest Atlantic groundfish crisis to deal with social and economic issues, sustainability, and community development. The group has worked to establish co-management of fishery resources, and the organization has identified many of the same benefits as Jentoft. Benefits identified include:

- Reduced conflict between gear sectors
- Reduced conflict between users and government
- Reduction of overinvestment
- More equitable allocation of fishing opportunities
- Improved data quality and analysis
- Promoting conservation and stock enhancement
- Promoting community economic development
- Promoting community self-determination (CCN 1997)

Communities interested in co-management have real-world examples by which to base their development and implementation of a community management program. However, communities interested in community management should also be aware that the process of implementing a community management program is difficult and success is not guaranteed.

¹ Although case studies were reviewed throughout this research project, a large scale review of them was not included in this paper, although some case examples are used to illustrate specific aspects of community management. Appendix C contains a supplementary bibliography that references these studies as well as other literature reviewed for this project that was not specifically cited in this paper.

3.2.2 Problems

Co-management is not an easy or overnight process. It requires bringing the managed community together with the managers and teaching these traditional adversaries to trust each other and work together cooperatively. Jentoft (1989) reviewed case studies and identified problems that may arise that may make designing, implementing, and sustaining community management difficult. Table 3.1 summarizes these problems.

Issues involving institutional arrangements may also create problems for community management beyond those detailed by Jentoft. For example, the free-rider problem and the potential for high transaction costs may be prohibitive. Mancur Olson, in his 1965 book, *The Logic of Collective Action*, argues *against* the idea that, if members of a group have the same objective and everyone would gain by achieving that objective, that rational individual will act to achieve the group's objective. Instead, he states that:

Unless the number of individuals in a group is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, *rational, self-interested individuals will not act [voluntarily] to achieve their common or group interests.* (Olson 1965: 2) [Emphasis added]

Individuals have little incentive to voluntarily contribute to the good of the whole because of the free-rider phenomenon (Kuperan and Abdullah 1994). It is possible that the promise of increased participation and decreased government involvement in fishery management decisions could be the incentive that encourages cooperation. However, unless there is some threat of government control returning, and some action on the part of the government to ensure that the group is behaving appropriately, community management could fail.

Table 3.1
Problems with Community Management Implementation
(Jentoft 1989)

Administrative resources	It may be difficult for fishermen's organizations to obtain sophisticated administrative resources and skills.
Conflict resolution	Co-management may reduce government-fishermen conflict, but conflicts will arise within the cooperative and may be difficult to resolve.
Diversity of membership	The more heterogeneous the membership, the more varied will be the members' interests, and the more likely there are to be conflicts.
Self-regulation	Members must enforce regulations on each other. Cooperatives are voluntary, but successful co-management requires non-voluntary imposition of regulations. If regulations are strict, members may become frustrated and leave the cooperative.
Unpopular decisions	The blame for unpopular regulations can not be passed to the government. If fishermen are able to leave the cooperative and receive a quota or license from the government, then if an individual does not like the cooperative he or she can leave, thereby weakening the cooperative. One solution to this problem is to give the cooperative ownership rights to fishing territories, and require fishermen to join a cooperative to fish.
Autonomy	Autonomy increases with the number of regulatory functions that are delegated to the cooperative.
Internal politics	Group rivalry, conspiracy, elitism may arise, leading to inequitable and rigid power structures.
Other interest groups	Other groups, including processors, fish plant workers, deck hands, environmental groups, and recreational fishermen also have an interest in fishery regulations. If not included, these groups could oppose co-management. However, the more groups that are included, the more complex co-management becomes.
Peer group pressure	Peer group pressure to adhere to rules can be effective in keeping members following the regulations, which may increase compliance. However, the people assigned to enforcement and monitoring may find it difficult to report their neighbors, thereby lessening the power of the cooperative to control its members activities.

High transaction costs, which are the administrative costs associated with instituting, designing, organizing, and maintaining a community management program, could also make developing a community management program difficult.

Transaction costs, which emerge because information is costly and therefore incomplete, profoundly influence systems of property rights and the logic of economic organization. The personal cost of enforcing control over resources is

inversely related to the support provided by the institutional environment. For instance, transaction costs are likely to be high in a new settlement prior to the establishment of some form of government...In all institutional environments, transaction costs depend on the measurability of resources and on the ease of monitoring their use (Eggertsson 1996: 159-160).

The process of developing a community management program will include many steps: obtaining community support, identifying stakeholders, determining program objectives, dividing responsibilities, assigning monitoring and enforcement responsibilities, and resolving conflict, to name a few. A great deal of time will need to be spent in the start-up stages, and it will take continued effort to ensure that the community management program is working as it is intended and making any necessary adjustments. These activities all increase the transaction costs. However, community management could also lower some costs, such as those involved with information gathering, coordination, monitoring, and enforcement (Hanna 1995).

The tradeoffs between the costs incurred and costs reduced through community management and the process of ensuring continued community participation, as well as the other problems identified by Jentoft will need to be considered and planned for, or else it is likely that they could overwhelm the community management process and result in its failure.

3.3 Characteristics of Success

In order to successfully participate in a co-management arrangement, communities must be able to establish local institutions that can develop rules and organize members' activities. It is likely that co-management will have to start by building institutions (Pomeroy and Berkes 1997). After looking at several case studies

involving institution building, Pomeroy and Berkes (1997) commented that it could take from three to fifteen years to build appropriate institutions.

Another important consideration of community management is whether resource users and the government can learn to trust each other and work together. Currently in the U.S. the government has responsibility for ensuring resource sustainability and developing management programs. Government agencies must be convinced that it is a good idea to share management responsibility with resource users.

One fundamental debate in co-management is whether resource users can be entrusted to manage their resources. Unless governments and decision-makers who implement government policies can be convinced of the desire and the ability of users to manage themselves, not much progress can be made in co-management...many managers have well-considered reasons to be skeptical about local-level management. To convince managers that local-level management is possible, part of the responsibility falls on the resource users themselves. The ability for self-management, in turn, partially depends on the ability of the local community to control the resource in question (Pomeroy and Berkes 1997: 467).

The trust-building aspect of community management is not the primary focus of this research, but it is an important aspect of the process and is crucial for laying the groundwork for a community management program.

Jentoft (1989) and Pinkerton (1994) comprehensively reviewed co-management arrangements and drew conclusions about the characteristics that increase successful community management. These characteristics of success assume that the government has instituted policies that support co-management. Governments need to provide a legal basis for the rights and authorities of community management groups, and officially apportion some of their power to the community (Pomeroy and Berkes 1997). Jentoft's characteristics of success are:

- 1) Jurisdiction and membership of the cooperative is of limited scale.

Participant democracy seems to flourish in smaller rather than larger organizations. Small organizations allow direct, personal participation. Large organizations must rely on indirect, intermediary representation in the decision-making process. The problem of free riders is found to occur more often in large organizations. In small organizations, free riders breaking the rules are easier to identify and control by informal sanctions. This problem is also a question of fishermen's sense of belonging to an organization. Members tend to feel a stronger identification with a small organization rather than a large organization (Jentoft 1989: 151)

- 2) The organization is homogenous.

The success of co-management is contingent upon fair and equal distribution of resource benefits. When the membership is homogenous, equal distribution will also be fair distribution. On the other hand, when the membership is heterogeneous...fair distribution is not necessarily the same as equal distribution (Jentoft 1989: 152).

- 3) A tradition of cooperation exists.

The Japanese are well known for their strong commitment to collective values and participatory decision making in business management. Undoubtedly, this is an important factor in explaining the success of fisheries co-management. Cooperation is in itself a learning process, and collective values are reinforced through such a process. If fishermen lack a positive experience of cooperation and collective action, introducing co-management has less chance of becoming successful (Jentoft 1989: 153-154).

- 4) Patience to build trust in the cooperative.

- 5) The cooperative provides additional benefits to its members. For example, marketing the cooperatives product, supplying credit, and supplying discount supplies will enhance the role of the cooperative to its members and possibly offset some of the management burden.

- 6) Users are granted authority by law to exclude non-members and to sanction members who violate the rules.

Pinkerton (1994) identified three conditions for success, each with a series of a sub-conditions. Her characteristics of success are:

- 1) Success is more likely when certain logistical problems are solved.
 - Clear boundaries
 - Clear criteria for membership or participation in local area management

- Management units of a scale appropriate to human resources and the ecology of the particular area
 - Clear interception agreements [between different parties]
 - Local all-stakeholder co-management boards
 - A coordinating role for a province-wide management board
- 2) Success is more likely if some of the costs are assumed "in kind" (e.g., through contributed volunteer labor and materials) by local bodies, related to the assumption of certain responsibilities and the ability to generate revenue.
- Cost recovery
 - A local volunteer force
- 3) Success is more likely when certain objective political conditions are met.
- A degree of local control
 - Clear legal definition of local powers

Clearly there are many different factors that contribute to the success of a community management program. Many of the factors identified by Jentoft and Pinkerton could be dealt with in the development of a community management program. For example, of Jentoft's six characteristics of success, only the third one, which states that a tradition of cooperation will increase the likelihood of success, could not be dealt with through the planning of the program. All of Pinkerton's conditions for success could also be dealt with through appropriate design of a community management program. However, and as mentioned earlier, underlying some of Jentoft's and Pinkerton's criteria for success is the assumption that government support exists and the government is able to allocate some degree of authority to local management cooperatives.

3.4 Community Management Structure

In community-based management, government agencies and resource users share responsibility for management functions. How responsibility is specifically shared will

vary from situation to situation. For example, the government may have responsibility for providing legislative authority, ensuring that conservation goals are met, and allocating quota between different cooperatives. The community may control the specific use of the quota, such as how quota is allocated within the cooperative and how to enforce the cooperatives regulations (Jentoft 1989). In this arrangement, the government is involved in macro-level decisions, but does not involve itself in the day-to-day decisions of the cooperative.

Fishery management involves a variety of functions, and determining how to share responsibility for fulfilling those functions is a major challenge of community management. Pinkerton (1989, as cited in Pomeroy and Berkes 1997) identified seven management functions that could be enhanced by cooperative action on the part of the users and the government. They are:

- Data gathering
- Logistical decisions such as who can harvest and when
- Allocation decisions
- Protection of resource from environmental damage
- Enforcement of regulations
- Enhancement of long-term planning
- More inclusive decision making

Some of these functions would likely be handled exclusively at the federal or local level, while others could be shared between the government and community.

On a general scale, there must be a clear commitment on the part of the government to share authority and power, probably enacted by legislation, with appropriate attention given to establishing administrative and policy structures that define the status, roles, and authorities of local organizations (Pomeroy and Berkes 1997).

The Coastal Communities Network (CCN) of Nova Scotia (1997) identified key participants in fisheries co-management, the various management functions, and who

would have responsibility for those functions. Table 3.2 shows the CCN's co-management framework. All participants that the CCN believed should have responsibility within a specific function are listed. Participants with primary responsibilities are bolded.

Table 3.2
Framework of Co-management Roles and Responsibilities
 (Coastal Communities Network 1997)

Fisheries Management Role	Responsibilities
Policy development and planning	Fishers, processors, shore-based workers, community, government
Habitat protection and enhancement	Community, fishers, government, natural scientists, processors, educators
Regulations	Fishers, processors, shore-based workers, community, government
Monitoring and enforcement	Government, fishers, processors, shore-based workers, community
Allocation	Fishers, Community, processors, shore-based workers, natural and social scientists
Data collection and research	Fishers, natural and social scientists, processors, shore-based workers, community

The groups of participants were defined as:

- **Fishers:** fishermen's organizations, inclusive of all gear types, regions, vessel sizes, and species targeted
- **Shore-based workers:** representatives of processors, including all variety of fish plants and processing facilities
- **Community:** representatives from groups not directly related to the fisheries, but concerned with and affected by the social, economic, environmental, and spiritual life of sustainable communities. This would include organizations that represent community councils or community development organizations, churches, environmental, and women's groups.
- **Government:** Federal government Departments of Fisheries and Oceans, Environment, Human Resources and Development. Provincial Departments of Fisheries, Environment, etc.
- **Scientists:** government, university, and independent natural and social scientists (CCN 1997).
- **Educators:** teachers and professors from all levels of educational institutions.

The CCN provides one example of how co-management can be arranged. Following are two examples of community management approaches being used to manage United States fisheries.

The approach to management taken by the Pacific Fishery Management Council (PFMC) is a form of co-management that falls under the 'consultative' category in Sen and Nielsen's continuum (Figure 3.1). Power-sharing occurs between the government, fishermen, and other resource stakeholders through the councils. The councils, composed of people, "knowledgeable concerning fisheries and the fishing industry," develop, monitor, and evaluate fishery management plans for different fisheries. Plans are approved by the Federal government before implementation (Pomeroy and Berkes 1997). Although this is a co-management arrangement, fishermen and communities do not have specific responsibilities for management implementation. All of the details of management are decided by the PFMC.

The North Pacific Fishery Management Council, which governs Alaskan fisheries, has been experimenting with community management through the community development quota (CDQ) program. A CDQ is a portion of the total allowable catch, which is allocated to a specific community who can then determine how to use the quota.

CDQs have the potential for involving a more diverse array of stakeholders in fishery management, spurring the development of innovative fishery management institutions, and possibly facilitating consideration of a wider set of the economic impacts of fishery management." (Fujita, Foran, and Zevos 1998: S147)

There are many more community management arrangements that could be reviewed. Each has a slightly different structure or division of responsibilities that has been designed to try and maximize the likelihood of success for each particular situation.

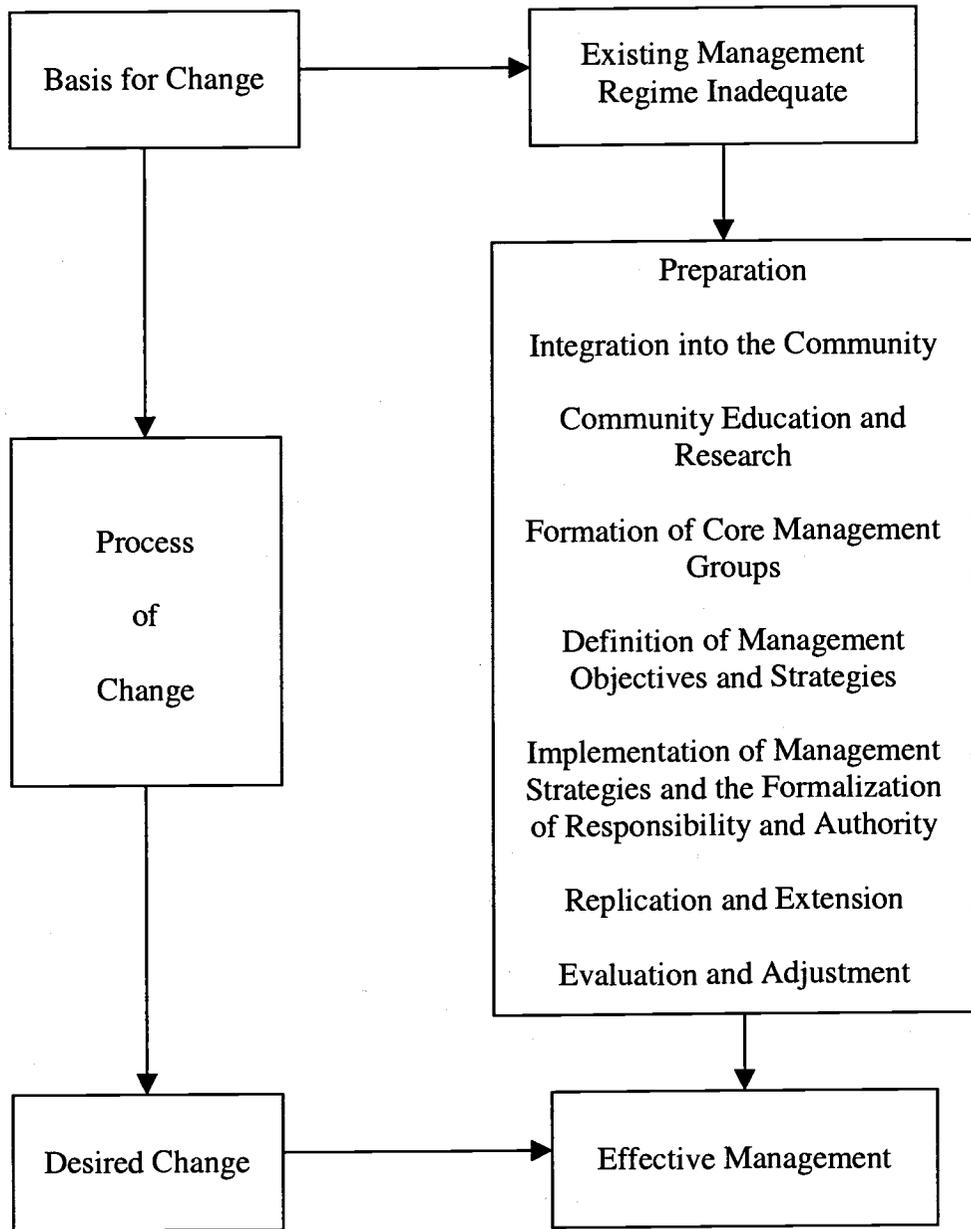
3.5 Implementing Community Management

The previous two sections of this chapter examined design factors that, if addressed when developing a community management program, will increase its chances for success, and various options for how roles and responsibilities could be shared. The next logical question is how would the government or a community begin developing a community management program? Communities are unlikely to decide to initiate a community management program without some expected economic or social benefit. Also, in a place like Oregon, where the fisheries have historically been managed by the government, communities would most likely require government support and/or initiation (White, Hale, Renard, and Cortesi 1994).

Figure 3.2 is based on a case study of the implementation process for community-based management of coral reefs by White, Hale, Renard, and Cortesi (1994). In this situation, the process was initiated by an external organization, there were a limited number of stakeholders, and the community management process was not challenged from outside interests. The figure provides a basic framework of the steps stakeholders would pass through while developing a community management program. The left column describes the overall process: resource stakeholders believe there is a basis for changing current management practices, they undergo a process of changing management, resulting in the desired change, interpreted to be an effective management program. The steps are explained as follows:

- **Preparation** includes preliminary activities (e.g, writing proposals, making institutional changes, hiring administrative staff) that end when activities begin in the community.

Figure 3.2
Framework for Community-Based Marine Resource Management
 (White, Hale, Renard, and Cortesi 1994)



- **Integration into the community** establishes the working relationship between the community and other organizations involved (e.g., government) and includes the collection of baseline data.
- **Community education and research** ensures support continues from within the community.
- **Formation of core management groups.** A strong community structure and community institutions are needed to take responsibility of management responsibilities.
- **Definition of management objectives and strategies** includes developing management plans and actions and defining implementation roles.
- **Implementation of management strategies and the formalization of responsibility and authority** includes formal [political] recognition of local management and legitimizing the community's rights.
- **Replication and extension** includes extending the knowledge and achievements outside of the community to increase credibility of community management to other groups and communities.
- **Evaluation and adjustment** to ensure that the management program is working as intended.

Pinkerton (1994) provided some basic rules for building a cooperative program, which are similar to those just described. Her rules are summarized in Table 3.3.

Table 3.3
Rules for Developing a Cooperative
(Pinkerton 1994)

1)	Have a convenor perceived to have appropriate stature, power, and purpose
2)	Obtain adequate representation of all relevant sectors
3)	Find a locally accepted basis for the legitimacy of participants
4)	Find a style of facilitation appropriate to the local situation
5)	Establish a shared definition of the problem
6)	Establish clarity about expected outcomes
7)	Undertake joint tasks, such as information searches, and assign asks to subgroups
8)	Articulate the values that guide each party's interest in the process
9)	Establish and enlarge a common sense of purpose
10)	Establish formal rules about how decisions are reached
11)	Establish ground rules for conduct, and formally assessing the fairness of these from time to time
12)	Inventory all technical, financial, and human resources accessible to the collaborators
13)	Negotiate agreement among collaborators
14)	Create a local constituency that supports implementation

The steps for initiating a community management program emphasize that community management, like any management program, is a process. In some ways, the initiation of a community management program is not drastically different from the development and initiation of any policy. It is not an instantaneous process, it requires a great deal of work, considerable planning, and substantial patience on the part of the stakeholders.

3.6 Summary

Community management is a viable approach to resource management that should be considered either as a supplement or an alternative to government management of privatizing fishery resources.

While it would be a mistake to consider the community-based aspect of co-management an automatic panacea for the array of fisheries management problems, it would be equally unfortunate not to take advantage of the management benefits available under community or mixed community-government arrangements (Pinkerton 1994: 2367).

Experiences with community management, along the entire spectrum of community-government responsibilities, have shown it to be an effective method of resource management under the proper conditions. The fact that certain elements need to be in place to make community management work indicate that it is not a project that should be taken without considerable planning and ground-work. Chapter 6 discusses the potential for community management in Oregon, based on a survey of coastal residents.

CHAPTER 4

SURVEY

This chapter reviews the survey of coastal residents and provides background discussion of the study area and the survey population to develop a context for understanding the importance of commercial fishing, historically and currently, to the surveyed communities. First in this chapter is a brief discussion of the purpose and structure of the survey, followed by a description of the study area, both geographically and demographically. Second, a demographic description of the population is provided. Third, the history of Oregon's commercial fishing industry and the current status of the industry is reviewed. Finally, the survey is discussed, with a brief explanation of its distribution and a summary of survey respondent demographics.

4.1 Purpose

This study was designed to try to understand how the individuals and families of Oregon's coastal communities are adapting to change. The broad aim of the survey was to identify community programs that improve human capital and determine how such programs could be improved to serve better the needs of residents. The survey contained five sections.

- General community characteristics
- Job skills and resources
- Educational resources for children
- Role of commercial fishing
- Demographics

Survey respondents were asked their opinions about various aspects of their community and about community programs in which they were familiar or had participated. See Appendix A for a copy of the entire survey.

Of interest to this report is the section of the survey that focused on the role of commercial fishing in the economics, culture, and history of coastal communities, and how the community could be involved in management of commercial fisheries. Within this section, survey recipients were asked a series of questions about how important they believed commercial fishing was to their communities, their awareness of and involvement in management, their opinions about whether the community should be involved in management, and if people would be willing to participate in community management efforts.

4.2 Study Area

4.2.1 Geographic Area

Survey recipients represented residents from Oregon's 11 incorporated commercial fishing port communities. The communities surveyed spanned the entire Oregon coast, representing all coastal counties except Douglas County. Communities surveyed, by county are:

- Clatsop County: Astoria
- Tillamook County: Garibaldi, Tillamook
- Lincoln County: Depoe Bay, Newport
- Lane County: Florence
- Coos County: Coos Bay, Bandon
- Curry County: Port Orford, Gold Beach, Brookings

Figure 4.1 shows the location of the surveyed communities, with the inland communities of Portland, Corvallis, Eugene, and Medford provided as reference points.

Survey Area



4.2.2 Demographics

Population and Income

The percent of county population living in the surveyed communities ranges from 2.0% in Florence, which is the only coastal town in the same county as a major city (Eugene) to 29.4% in Astoria. 1990 Median household income ranged from approximately \$17,000 in Tillamook, Bandon, and Port Orford to approximately \$24,000 in Astoria, Newport, and Brookings. Table 4.1 shows population and income information for each community surveyed (Oregon Economic Development Department 1998).

Table 4.1
Surveyed Community and County Populations and Median Income
(Oregon Economic Development Department 1998)

Community	1995 Population	1995 County Population	% of County Population	1990 Median Household Income
Astoria	10,100	34,300	29.4%	\$24,325
Garibaldi	950	23,300	4.1	18,973
Tillamook	4,245		18.2	17,500
Depoe Bay	1,025	41,800	2.5	22,500
Newport	9,495		22.7	24,137
Florence	6,185	301,900	2.0	18,991
Coos Bay	15,430	62,100	24.8	21,579
Bandon	2,610		4.2	17,708
Port Orford	1,050	22,200	4.7	17,961
Gold Beach	2,080		9.4	21,337
Brookings	5,220		23.5	24,090
TOTAL	58,390	485,600		

Employment

The Oregon Economic Development Department (OEDD) provides information about employment by industry at the community level. Information from OEDD about employment in the commercial fishing industry is summarized to provide an idea of the economic importance of commercial fishing to the communities surveyed. OEDD

includes commercial fishing in the "agriculture, forestry, and fishing" category.

Therefore, the actual numbers presented are likely to overestimate the number of people employed full time in the commercial fishing industry. However, in many fisheries, especially crab and salmon, fishing is a part-time occupation. Since these part-time fishermen may not consider fishing to be their primary occupation, they may not be included in OEDD's employment database. As a result, it is possible that OEDD may underestimate the importance of fishing, in terms of employment and income generation, to a community (Rettig 1998).

The percent of people employed in agriculture, forestry, and fishing in the surveyed communities ranges from 3.3% in Tillamook, to 22.9% in Port Orford. However, these figures do not include people employed by fish processing facilities. OEDD also lists the five major employers in each community and the number of people employed by that company. In Astoria, Newport, and Coos Bay, Bandon, Port Orford, Gold Beach, and Brookings the largest employers were fish processing companies. When the number of people employed in processing is added to the number of people employed in agriculture, forestry, and fishing, the percent of people employed increases significantly for some communities, and now ranges from 3.3% in Tillamook to 65.4% in Gold Beach (Oregon Economic Development Department 1998). Table 4.2 shows the percent of people employed in agriculture, forestry, and fishing by community (labeled OEDD) and the percent of people employed in agriculture, forestry, and fishing recalculated to include people employed by processors (labeled Including Processors).

Table 4.2
Community Employment in Commercial Fishing
(Oregon Economic Development Department 1998)

Community	% Employed Agriculture, Forestry, Fishing	
	OEDD	Including Processors
Astoria	4.4%	10.2%
Garibaldi	15.5	15.5
Tillamook	3.3	3.3
Depoe Bay	6.5	6.5
Newport	6.0	32.7
Florence	4.7	4.7
Coos Bay	5.9	7.5
Bandon	5.8	15.1
Port Orford	22.9	41.6
Gold Beach	10.1	65.4
Brookings	4.6	7.2

OEDD also identifies the principal industries in each community. All of the communities except Florence name fishing as a principal industry, and Tillamook, Bandon, Port Orford, and Gold Beach all list fishing as one of their targeted industries for future development (Oregon Economic Development Department 1998).

The Oregon Employment Department (OED) provides projections of occupational trends for the state on a regional, multi-county level. Surveyed communities fall into Region 1 (Clatsop, Columbia, and Tillamook Counties), Region 4 (Benton, Lincoln, and Linn Counties), Region 5 (Lane County), and Region 7 (Coos and Curry Counties). The data are collected from employer surveys and economic analysis of employment levels and patterns. Oregon and the four regions containing the counties of surveyed communities show a projected increase in employment for all occupations, and all of the regions except for Region 7 (Coos and Curry Counties) show an increase in agriculture, forestry, and fishing occupations. However, Oregon and all of the regions predict a

decrease in employment for fishing vessel deckhands (Oregon Employment Department 1997). Table 4.3 shows employment projections for 1996-2006.

Regional Economic Profiles

Oregon's Employment Department (OED) publishes an annual Regional Economic Profile for each region in the state. Following is a summary of common themes for all of the coastal regions and of trends in the individual regions containing surveyed communities. The Regional Economic Profiles contain a great deal of information about the area's population, labor force, industries, occupations, and income and wages. Key characteristics common to all four of the regions in the study are summarized below to provide a general picture of the economic changes occurring in the surveyed communities (Oregon Employment Department 1997).

- Natural resource-based industries, especially lumber and wood products, once comprised a significant portion of coastal economies. Many of these industries are in decline, and although still important, are being replaced by non-manufacturing industries¹.
- Retirees are an increasingly important component of coastal economies, and services targeted to seniors (e.g., health care, recreation) are a growing part of coastal employment. In addition, the influx of retirees is likely to add stability to the local economies because their income sources and spending patterns are not readily affected by fluctuations in business

¹ The economic profiles refer to jobs in the manufacturing and non-manufacturing sectors: manufacturing sectors are defined as those that produce a tangible good, with all other industries assigned to the non-manufacturing sector. For example, commercial fishing is considered manufacturing, while sales is non-manufacturing. The switch from manufacturing to non-manufacturing industries is a nation-wide trend.

Table 4.3
Oregon Occupational Projections (1996-2006)
(Oregon Employment Department 1997)

Area	Occupation	1996 Employment	2006 Employment	1996-2006 Percent Growth	1996-2006 Net Growth	
Oregon	Total, All Occupations	1,503,310	1,813,900	20.7%	310,590	
	Ag, Forestry, and Fishing Workers	52,810	58,762	11.3	5,952	
	First Line Supervisors	2,223	2,404	8.1	181	
	Deckhands - Fishing Vessels	617	579	-6.2	-38	
<u>Region 1</u>	Total, All Occupations	32,480	38,029	17.1	5,549	
Clatsop	Ag, Forestry, and Fishing Workers	1,621	1,875	15.7	254	
Columbia	First Line Supervisors	124	144	16.1	20	
Tillamook	Deckhands - Fishing Vessels	168	146	-13.1	-22	
<u>Region 4</u>	Total, All Occupations	97,462	117,113	20.2	19,651	
Benton	Ag, Forestry, and Fishing Workers	3,568	3,897	9.2	329	
Lincoln	First Line Supervisors	163	172	5.5	9	
Linn	Deckhands - Fishing Vessels	252	236	-6.3	-16	
<u>Region 5</u>	Total, All Occupations	134,325	160,947	19.8	26,622	
	Ag, Forestry, and Fishing Workers	3,293	3,802	15.5	509	
	Lane	First Line Supervisors	221	247	11.8	26
	Deckhands - Fishing Vessels	18	16	-11.1	-2	
<u>Region 7</u>	Total, All Occupations	28,056	31,309	11.6	3,253	
	Ag, Forestry, and Fishing Workers	1,515	1,506	-0.6	-9	
	Coos	First Line Supervisors	107	98	-8.4	-9
	Curry	Deckhands - Fishing Vessels	182	169	-7.1	-13

cycles. Transfer payments, which include Social Security and other retirement payments, Medicare, and veteran's benefits, are a large portion of personal income in coastal communities (25% in Lincoln County, 27% in Coos and Curry Counties).

- Tourism and businesses and services that attract visitors are also a growing part of coastal economies. Tourism-related industries (restaurants, motel/hotel, and retail) often do not pay high wages, and are associated with seasonal unemployment.
- The growth of high-tech industries in Oregon is also influencing the employment in coastal communities, especially in professional and technical occupations.

Appendix B provides a more detailed summary of the Regional Economic Profile reports for each region studies, with specific focus on changes in the fishing industry.

4.3 Commercial Fishing in Oregon

4.3.1 History

Commercial fishing has played an important role in Oregon's development, both economically and culturally. This section provides a brief overview of the history of commercial fishing in Oregon. The summary below, unless specified, is based on information found in background materials compiled in 1997 by Ginny Goblirsch, an Oregon Sea Grant marine extension agent, about Oregon's commercial fishing industry.

Commercial fishing began in Oregon for Columbia River salmon in the 1800's, and the fishery expanded rapidly with the introduction of packing plants. Initially fishing

was concentrated in the lower Columbia River, until the early 1900s when the introduction of gasoline engines allowed gill-netters to leave the river for the open ocean. In 1915 approximately 500 boats were fishing off the mouth of the Columbia, and by 1920 approximately 1,000 trollers were fishing various parts of the Oregon coast. Salmon stocks had declined by the mid-1900s, and this previously unregulated fishery started to be managed through gear restrictions and quotas. Hatcheries were also built to help mitigate the decline of wild salmon populations.

The trawl fishery developed in the 1930s, with a great increase during the W.W.II years, when protein sources were in short supply. Trawlers started moving further offshore after the war. The Dungeness crab fishery also developed in the 1930s with improvements in refrigeration and transportation. The first commercial landings of Albacore tuna also occurred in Oregon in the 1930s. The pink shrimp fishery did not develop until the late 1950s, but remained slow until peeling machines were introduced in the late 1960s.

Since the 1960s, Oregon fishing has undergone many changes. The 1960s were a time of prosperity for many fishermen because of increased earnings in the salmon and crab fisheries. Landings continued to increase through the 1970s, with particular successes in the shrimp fishery. The passage of the Magnuson Act in 1976 excluded Japanese and Soviet vessels from continuing to fish the already depleted stocks of halibut, Pacific ocean perch, and other species. Domestic fishermen, many with new boats and gear as a result of various federal programs, were optimistic about the future of the commercial fishing industry. In the late 1970s the salmon and shrimp fisheries declined, but the trawl fishery and joint-venture operations continued to thrive. Entering

the 1980s, the Oregon fishery was heavily overcapitalized, oil prices and insurance rates were high. These factors in combination with the detrimental effects of the severe 1982-1983 El Niño on fish stocks brought hardship to Oregon's fishing industry. The distant water fishery was the only fishery to come out unscathed, and as a result more and more fishermen joined Alaskan distant water fleets.

4.3.2 Commercial Fishing in the 1990s

Commercial fishing in Oregon has continued to change since the 1980s. One of the major changes has been the development of the Pacific whiting, once called hake and viewed as a trash fish. The pink shrimp fishery continues to be strong, landing close to the fishery's long-term average of approximately 20-25 million pounds per year. The market conditions for this fishery have also been good because of the decline of the Northeast cold water shrimp fishery. The Dungeness crab fishery has remained strong, with landings in the first half of the 1990s doubling. In 1996-97 landings declined sharply, but high prices offset lower landings. The tuna fishery also remains strong (Pacific Fishing Yearbook 1998).

However, it has not all been good news. The decline of the salmon fishery has continued and received more frequent and more serious attention from fishery scientists fishery managers, fishermen, and the general public. In general, salmon fishing has been seriously curtailed. In an attempt to prevent further decline and possible extinction, some stocks of salmon have been listing under the Endangered Species Act (ESA) and others are being proposed for listing. To try and prevent an ESA listing for coho salmon, Oregon developed a community-based, watershed-based recovery plan for salmon, which

was approved by the Federal government in 1996. The plan was not entirely successful, as coho salmon are proposed for ESA listing and are expected to be listed soon.

However, it is expected that Oregon's community-based plan for salmon recovery will be a major part of the National Marine Fisheries Service's salmon recovery plan (Rettig 1998).

Groundfish have also received a lot of attention and worry from scientists, managers, and fishermen. Sustainable Fisheries Act requirements and 1997 stock assessments indicated that substantial harvest reductions were required to maintain the stocks. The Pacific Fishery Management Council (PFMC or the Council) set the Acceptable Biological Catch (ABC) and Harvest Guidelines for six species at the lowest level ever. The dilemma that the Council is dealing with is the stocks, if not protected, could be fished to unhealthy levels, but on the other hand, sharp cuts in groundfish quotas could severely, and negatively, impact the fishing industry, and fishing communities.

In 1996, 263 million pounds of fish were landed in Oregon's ports, with an ex-vessel value of \$82.4 million, up 24 million pounds and 6.6% in value from 1995. Much of the increase was due to strong crab and whiting landings. The 1996 contribution to total catch was:

- 156 million pounds of Pacific Whiting (vs. 5 million pounds in 1990)
- 58 million pounds of other groundfish
- 19 million pounds of crab
- 16 million pounds of shrimp
- 9 million pounds of tuna
- 3 million pounds of salmon (vs. 1.3 million pounds in 1994 and 19 million pounds in 1988) (Oregon Employment Department (Region 7) 1997).

Individual ports vary in the species landed, total landings, and value landed. Astoria, Newport, and Charleston/Coos Bay are the largest ports in Oregon. For example, in

1995, Newport, Oregon was the 13th highest port in the country in pounds landed and 31st highest in value. In 1996, fishermen landed 115 million pounds of fish worth \$24 million. Just ten years earlier Newport fishermen landed 26.7 million pounds worth \$13.5 million (Goblirsch 1997). Despite such strong showings, the decline of certain fisheries, specifically salmon and groundfish, still receive a lot of attention. In addition, they generate a lot of discussion about what can be done to improve the science and management of these fisheries and maintain the fishing culture that, to many, defines the Oregon coast.

4.4 Survey

4.4.1 Survey Distribution

In the fall of 1997, 750 residents in Oregon's eleven incorporated fishing port communities were surveyed. Survey recipients were randomly selected from telephone directory listings by an independent company. Using the Total Design Method (Dillman 1978), surveys were sent by mail, with follow-up postcards, surveys, and telephone calls. Of the original 750 surveys mailed, 631 were eligible households. Fifty-one percent of recipients (323 people) responded. Table 4.4 shows the distribution of surveys sent and the response rate by community.

4.4.2 Respondent Demographics

The number of households receiving surveys in each community was calculated to statistically represent each community. However, as shown in Table 4.4, the actual number of surveys sent to and received from each community, as well as the percent of

Table 4.4
Survey Distribution and Community Response

Community	1995 Population	Number of Surveys Mailed	Percent of Coastal Population	Number of Eligible Surveys	Number of Returned Surveys	Survey Response Rate	Percent of all Surveys Returned
Astoria	10,100	135	17.29%	119	60	50.42%	18.58%
Garibaldi	950	13	1.63	11	8	72.73	2.48
Tillamook	4,245	59	7.27	57	24	42.11	7.43
Depoe Bay	1,025	23	1.76	12	9	75.00	2.79
Newport	9,495	103	16.26	78	37	47.44	11.46
Florence	6,185	89	10.59	84	48	57.14	14.86
Coos Bay	15,430	184	26.43	145	73	50.34	22.60
Bandon	2,610	38	4.47	36	18	50.00	5.57
Port Orford	1,050	16	1.80	13	9	69.23	2.79
Gold Beach	2,080	24	3.56	20	9	45.00	2.79
Brookings	5,220	66	8.94	56	28	50.00	8.67
TOTAL	58,390	750	100.00	631	323	51.19	100.00

the total that each community represents is different. Community representation ranges from 2.5% (Garibaldi) to 23% (Coos Bay) of returned surveys.

Survey recipients were asked if they were currently employed, and if so to identify their current occupation. Or, if currently unemployed or retired, to identify their past occupation: 47.5% of survey respondents (excluding non-respondents) were currently employed, and 53% were either currently unemployed or retired. Excluding non-respondents, 5.1% of respondents were currently employed in commercial fishing or fishing-related work and 5.0% had been in the past. The high percentage of unemployed people may reflect the high number of older, retired people living in coastal communities.

The majority of respondents, 64.4%, were male, 33.4% were female, and 2.2% did not answer this question. Survey recipients were identified by telephone directory listings, and since many listings are in the male head-of-household's name, that may account for the high percentage of male respondents. On the cover page of the survey, the adult with the most recent birthday was asked to fill out the survey to ensure equal representation, but it is likely that the addressee completed the survey instead.

The average age of respondents was 59 years old, with a median age of 60. The age of respondents ranged from 22 to 92. Thirteen people did not answer this question. Respondents were required to be at least 18 years old, so comparisons to county or state level census data, which includes all ages, could not be directly made.

The majority of respondents, 65.9%, were currently married, 12.2% widowed, 10.2% divorced, 4.3% unmarried living with partner, 4.0% single, and 0.6% separated, with 2.2% not responding.

Most respondents, 91.3%, were white, 3.1% of other ethnicity, 1.9% Native American, 0.6% Asian or Pacific Islander, and 0.3% Latin American, with 2.8% not responding.

Most respondents, 30.7%, had completed some college, 20.7% had completed high school or received a GED, 14.6% had a bachelor's degree, 13.0% had a graduate or professional degree, 7.1% had vocational, trade, or business education, 6.2% had an associate's degree, 4.6% had not completed high school, and 3.1% did not respond.

The majority, 92.6%, of respondents were year-round residents, with 4.6% seasonal, and 2.8% not responding. Most people, 78.6%, did not plan to move away within the next five years, 16.7% did plan to move away, 4.3% did not respond, and 0.3% did not know if they would move. When asked why they were not planning on moving, 22.4% of respondents said that they liked the community, 9.1% were happy with their community, and 7.1% identified their community as home. When asked why they were planning on moving, 18.5% of respondents cited job-related reasons, 11.1% planned to move to be closer to family, and 9.3% were planning on moving because of social factors. Health care, education, and economic factors were mentioned by about 5% of respondents.

Household income ranged from less than \$5,000 (0.3% of respondents) per year to \$75,000 or higher (9.3% of respondents). Average income was \$35,000-\$39,999, with median income in the same range, but the mode in the \$50,000-\$74,999 range (possibly because other income categories were listed in \$5,000 increments). Respondents were also asked what percentage of their household income they spend in their community. On average, people spent 67.3% of their household income in their communities.

The first section of the survey asked people about some general community characteristics. Analyzing all of those responses is out of the scope of this work, but one question was analyzed to provide additional insight into how people view their community. On a scale of 1 to 5, with 1 representing "not at all important" and 5 representing "extremely important," survey recipients were asked to identify how important various items were for the future quality of life in their community. They were then asked to rank the top three items. Overwhelmingly, people identified "increasing economic opportunities for local residents" as a top priority for the future quality of life in their community. People identified both "increasing economic opportunities for local residents" and "increasing the community's ability to influence state and federal decisions that affect local residents" as their second most important factors influencing future quality of life. For the third most important factor, people identified "maintaining the natural resource history of the area."

CHAPTER 5

RESULTS AND ANALYSIS

Two research questions drove the development of the commercial fishing section of the survey and subsequent analysis. They were:

- 1) Are coastal residents amenable to the concept of community management and would they support a community management approach?
- 2) Who are the people who support community management, and in what ways do they differ from the full surveyed population?

Previous chapters have discussed fishery management, community management, and the surveyed population. The purpose of these chapters was to provide a context for understanding trends in fishery management, the possibility for management through a community-based approach, and how community management could solve some of the problems that fishery managers traditionally must face. The discussion of commercial fishing in Oregon and the demographics, employment, and economic condition of the study area was intended to provide a framework for understanding the cultural and economic importance the fishing industry has in Oregon's coastal communities. This chapter discusses the results of the commercial fishing section of the survey. This chapter contains interpretation of results as far as it helps to clarify or explain responses or trends in responses to specific questions. Chapter 6 will discuss the results within the broader context of developing a community management approach to fisheries management in Oregon.

The commercial fishing section of the survey is comprised of nine questions. The first set of questions, 22 through 25, were designed to learn what people think about the commercial fishing industry: how many people are employed in commercial fishing, how the industry will change in the future, its importance in the community in the past, in the present, and in the future, and whether it should be maintained. The second set of questions, 26 through 29, attempted to elicit information about people's involvement in fishery management and their awareness of the organizations that influence natural resource and fishery policy. Finally, question 30 asked people if they believed fishery management should be conducted at the community level. Ancillary to Question 30 were four parts asking people if they would participate in community management, how revenues should be raised, and if they would volunteer time or pay money in support. It was assumed that people who answered "yes" to Question 30 were supportive of fishery management at the community level.

This chapter describes aggregated responses to the commercial fishing section of the survey, reviewing the survey group as a whole, side-by-side with people who are supportive of community management. The full survey group includes all survey responses, including the subgroup of people supportive of community management because any generalizations about community management will include them. Where appropriate, an analysis of variance (ANOVA) was conducted to see if significant differences (significance <0.05) existed between people who answered yes to Question 30, indicating support for community management, and people who answered no to Question 30. Demographics for people who answered yes to question 30 are summarized at the end of this chapter.

The data are generally presented as percent of respondents answering in a given manner. As a reminder, the full survey group consisted of 323 respondents, and 169 of those people answered yes to Question 30. If percentages in text or in figures do not add up to 100%, the remaining percent is people who did not respond to a question.

As with any research project, a great deal of additional analysis could have been done. However, for the purpose of this paper and for answering the research questions identified, the analysis was mostly limited to descriptive statistics.

All figures referenced in the text of this chapter appear at the end of the chapter.

5.1 Analysis of Survey Responses

This section reviews survey questions about commercial fishing in the order they were presented in the survey. After each question, it is noted whether the question was open ended or had structured responses. If people were asked to select from a set of choices, those choices are provided. Appendix A shows the full survey.

Question 22 What percentage of people in your community do you believe are employed in the commercial fishing industry? [Open-ended]

On average, respondents believed that 19.3% of people in their community were employed in the commercial fishing industry. Responses ranged from none to 80% of people in the community employed in the commercial fishing industry, with a median of 15% and a mode of ten percent. When averaged by town, responses ranged from 6.4% in Gold Beach to 40.9% in Garibaldi. People supportive of community management believed that, on average, 21.9% of people in their communities were employed in

commercial fishing, ranging from none to 80%. The distribution of responses by community was very similar to that of the entire survey. Figure 5.1 shows the distribution of average responses delineated by community for the full survey and for people supportive of community management.

In Chapter 4, Oregon Economic Development Department (OEDD) data regarding the percent of people employed in agriculture, forestry, and fishing was provided. The data were also manipulated to include people employed in fish processing *if* the processor was identified as one of the five largest employers in town. Figure 5.2 shows the distribution of survey responses, for the full survey group, against OEDD data. Survey respondents neither systematically overestimated nor underestimated the percent of people employed in commercial fishing in their communities, although more communities do appear to be overestimating.

Analysis of variance indicates a significant difference between respondents supportive of community management and respondents not supportive of community management with regard to the percentage of people the respondents believe are employed in commercial fishing.

Question 23 Do you see the percentage of people in the commercial fishing industry increasing or decreasing in the future? [Circle response] Why? [Open ended]

Respondents were given a choice of selecting "increasing greatly," "increasing somewhat," "no change," "decreasing somewhat," and "decreasing greatly." The majority of respondents, 53.3%, said commercial fishing would decrease greatly in the

future, while 31.3% said commercial fishing would decrease somewhat in the future. Of the remaining respondents, 7.7% did not know or did not respond, 6.5% thought there would be no change, and only 1.2% believed commercial fishing would increase somewhat or greatly in the future.

Of people supportive of community management, 60.4% believed the percentage of people in the commercial fishing industry would decrease greatly in the future, while 27.2% said it would decrease somewhat. The same percentage of respondents believed there would be no change, while slightly more, 1.8%, believed commercial fishing would increase greatly or somewhat in the future.

Based on the responses to Question 22, it appears that although people assign a great deal of importance to commercial fishing, they do not believe it will remain a strong influence in their community. Figure 5.3 shows survey responses for the full group and people supportive of community management.

Respondents were given the option of explaining why they believed the commercial fishing industry was changing. Respondents from the full survey and from people supportive of community management cited lack of fish (38.4% and 37.3%, respectively), followed closely by rules/regulations (29.7% and 34.3%, respectively) as the primary two reasons for changes in the commercial fishing industry. Other reasons included environmental issues, economic issues, political reasons, and people needing to leave the area to fish elsewhere (Figure 5.4).

Question 24a How important of you think commercial fishing has been in the historical development of your community? [Circle response]

Question 24b How important do you think commercial fishing is in your community right now? [Circle response]

Question 24c How important do you think commercial fishing will be in the future of your community? [Circle response]

Respondents were asked to circle a number on a scale of one to five, with one identified as "not at all important" and five as "extremely important" for each of the questions above. For this discussion, survey categories were regrouped, with "1" and "2" representing low importance, "3" representing somewhat important, and "4" and "5" representing high importance. When asked about the importance of commercial fishing in the past, the vast majority of respondents, 84.6%, selected the high category. Given the historical development of the communities surveyed, such a response is not surprising. The distribution flattened out considerably when respondents were asked about the importance of commercial fishing now: 28.1% of respondents fell into the low category, 31.1% into the middle category, and 35.3% into the high category. When asked about the future, the distribution shifts further to the "low" end of the scale, with 47.0% of respondents selecting the low categories, 20.4% selecting the middle category, and 26.3% selecting the high category. People clearly believe that commercial fishing was very important in the past, is diminishing in importance, and will continue to do so. However, they do not appear to believe that commercial fishing will disappear from their community.

The majority of people supportive of community management, 90.5%, also believed commercial fishing was important in the past. The distribution flattened out when respondents were asked about the importance of commercial fishing now, but not

as much as for all survey respondents: 21.9% of respondents fell into the low category, 27.2% into the middle category, and 60.3% into the high category. When asked about the future, 41.4% of respondents selected the low category, 21.3% selected the middle category, and 26.3% selected the high category. As with the full survey group, people supportive of community management believe that the importance of commercial fishing has declined and will continue to decline, but they seem to believe that it is more important now and will maintain a stronger presence in their community than the full group of survey respondents. Figures 5.5a and b show the distribution of responses to this question for the full survey group and the sub group, respectively.

Analysis of variance indicates a significant difference between respondents supportive of community management and respondents not supportive of community management with regard to the importance of commercial fishing in the past, in the present, and in the future.

Question 25 Do you think that your community should try to maintain the commercial fishing heritage of the area? [Circle response] How? [Open-ended]

The majority of respondents, 76.5%, believed that the community should maintain its commercial fishing heritage, 14.2% did not respond, and only 9.3% said that the community should not maintain its commercial fishing heritage. More of the people supportive of community management, 85.8%, believed that the community should try to maintain its commercial fishing heritage, 6.5% did not think the community should maintain commercial fishing, and 7.7% did not respond (Figure 5.6) Despite responses in previous questions indicating that people think commercial fishing will become less

important to their communities, respondents overwhelmingly also believe that it is an important aspect of their culture and should be maintained.

Analysis of variance indicates a significant difference between respondents supportive of community management and respondents not supportive of community management with regard to whether the community should maintain its commercial fishing heritage.

It is often easier for people to say something should be done, and more difficult to determine how it should be done, as illustrated by responses to the second part of this question. Only 49.7% of the full survey group and 58.1% of people supportive of community management provided suggestions for how the community could maintain commercial fisheries. Also, the majority of respondents, 18.9% of the full survey group and 23.1% of people supportive of community management, fell into a "miscellaneous" category, and reflected comments that people made that did not correctly answer the questions. For example, many people wrote that "fishing is important" instead of providing a specific way for how commercial fishing could be maintained. This may indicate either confusion with the question or general uncertainty about how a community would go about maintaining commercial fishing.

Of people responding with specific suggestions for how commercial fishing could be maintained, better management was cited the most (17.6%), with improving the environment the second most common response (4.3%), and using hatcheries as the third most common response (2.2%). Of people supportive of community management, better management (21.3%), using hatcheries (4.1%), and improving the environment (3.6%) were the top three responses. Respondents also mentioned balancing fishing with the rest

of the economy, developing new markets, involving fishermen, and developing recreational opportunities. Figure 5.7 shows the distribution of responses to this question.

Question 26 Are you familiar with fishery management activities in your area? [Circle response]

Approximately the same number of respondents from the full survey group were familiar with fishery management activities (46.4%) as were not familiar with fishery management activities (47.7%). However, approximately ten percent more respondents who were supportive of community management were familiar with fishery management activities (58.0%) than were not familiar with management activities (47.7%) (Figure 5.8).

The large number of people familiar with fishery management activities is interesting because only 5.1% of people in the full survey group were currently employed in the commercial fishing industry or a fishery-related business, and only 5.0% had been employed in the commercial fishing industry or fishery-related business.¹ Of people supportive of community management, 5.8% were currently employed and 8.2% had been employed in the commercial fishing industry or fishery-related business in the past.

Analysis of variance suggests a difference between respondents supportive of community management and respondents not supportive of community management with regard to their familiarity with fishery management activities, however, the ANOVA was not significant at 0.05.

¹Survey recipients were asked whether they were currently employed, and if so to identify their current occupation. If not currently employed, they were asked to identify their most recent occupation.

Question 27 How frequently have you (or someone in your household) participated in the fishery management process in the past (e.g., attended Pacific Fishery Management Council meetings?) [Circle response]

The majority of respondents, 79.9%, had never participated in the fishery management process. However, approximately 15% of respondents had participated in the management process, with 10.2% participating one to two times per year, 1.9% percent participating three to five times per year, and 3.1% participating more than five times per year. Of people supportive of community management, 79.9% had never participated in the fishery management process. However, 20.2% of people supportive of community management had participated in the management process, with 14.2% participating one to two times per year, 2.4% participating three to five times per year, and 3.6% participating more than five times per year (Figure 5.9).

Question 28 In your opinion, what would be a realistic role for the general public in fisheries management? [Circle all that apply]

Survey respondents were asked to circle one or more of the choices provided, which were arranged similar to Sen and Nielsen's (1997) spectrum of co-management arrangements, as discussed in Chapter 3. Choices provided about the role of the general public in fisheries management included: (1) none; (2) provide suggestions and let resource professionals decide; (3) serve on advisory boards that review and comment on decisions; (4) act as full and equal partners in making management decisions; (5) the public should decide management issues and resource professionals should carry them out; and (6) other (with space to specify). Responses from category (6) were excluded

from the analysis because there was no trend in responses regarding how the public should participate. Responses in this category do not sum to 100% because survey respondents were given the option of selecting more than one option.

Figure 5.10 shows the distribution of responses for the full survey group and people supportive of community management. The full survey group appears normally distributed around category 3 (public serves on advisory boards that review and comment on decisions), which was selected by the most respondents, 34.4%. The distribution of people supportive of community management appears to be skewed more to the right than the full survey group, with most respondents, 37.9% stating that the public should act as full and equal partners in resource management decisions. These distributions indicate that people supportive of community management believe the public should have an active role in fishery management.

Analysis of variance indicates a significant difference between respondents supportive of community management and respondents not supportive of community management with regard to two of the options: the public acting as a full and equal partner with resource professionals, and the public deciding and resource professionals implementing the public's decisions.

Question 29 In recent years, many organizations, institutions, and individuals have influenced natural resource policy. We would like to know how much trust you have in those below that are directly or indirectly involved in managing fisheries and how much influence each agency should have. On the left side of the page, circle the number that indicates your trust in their

ability to contribute to good fisheries management. On the right side, circle the number that indicates the amount of influence these organizations should have in fisheries management.

Survey respondents were asked to think about the amount of trust they had in each organization and the amount of influence they believed each organization should have in fishery management on a scale of one to five, with one representing "none," two representing "limited," three representing "uncertain," four representing "moderate," and five representing "a great deal." The organizations listed include:

Federal Agencies

- U.S. Bureau of Land Management
- U.S. Forest Service
- U.S. Fish and Wildlife Service
- National Marine Fisheries Service

Regional/State Organizations

- Pacific Fishery Management Council
- State Agencies
- Governor of Oregon

Other Federal/National Organizations

- U.S. Congress
- Federal Courts
- Tribal Governments
- University Researchers
- National Public Opinion

Local Organizations

- Local Government
- Local Port Authorities
- Commercial Fishermen
- Watershed Councils

The categories were averaged to give a general idea of the degree of trust the public has in these organizations and also the amount of influence the public believes they should have. A score of less than three indicates a lower degree of faith in an organization, and a score of greater than three indicates a higher degree of faith in that organization. Table 5.1 shows the averaged responses for each organization for the full

survey group and people supportive of community management. Organizations receiving a score of more than three are shaded.

Table 5.1
Trust and Influence in Fishery Management Organizations
Averaged Responses

Organizations		All Surveys		Supportive of CM	
		Trust	Influence	Trust	Influence
Federal Agencies	U.S. Bureau of Land Management	2.62	2.76	2.50	2.70
	U.S. Forest Service	2.83	2.93	2.71	2.86
	U.S. Fish and Wildlife Service	3.01	3.34	2.81	3.22
	National Marine Fisheries Service	3.01	3.39	2.83	3.26
Other Federal/ National	U.S. Congress	1.90	2.23	1.86	2.12
	Federal Courts	2.36	2.25	2.20	2.14
	Tribal Governments	2.39	2.49	2.29	2.35
	University Researchers	3.08	3.04	2.97	2.97
	National Public Opinion	2.69	2.66	2.74	2.78
Regional and State	Pacific Fishery Management Council	2.98	3.33	2.94	3.26
	State Agencies	3.07	3.46	2.94	3.33
	Governor of Oregon	2.69	2.71	2.49	2.65
Local	Local Government	2.81	3.12	2.89	3.29
	Local Port Authorities	2.89	3.07	2.95	3.26
	Commercial Fishermen	3.51	3.70	3.80	4.01
	Watershed Councils	2.87	3.03	2.88	3.11

The public had a higher degree of trust in the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, University Researchers, the Pacific Fishery Management Council, State Agencies, and Commercial Fishermen. The public identified the same organizations as well as the other local organizations (local governments, local port authorities, and watershed councils) as organizations that *should* have a higher degree of influence in fishery management decisions. Also of note, the scores for the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Pacific Fishery Management Council, State Agencies increased considerably when asked about the degree of influence these organizations *should* have in fishery management decisions.

For both trust and influence the score for commercial fishermen remains high, and is the highest score received for all organizations. The group of respondents supportive of community management appears to have less trust of the organizations than the full survey group, and identified commercial fishermen as the only group in which they had a significant amount of trust. Respondents supportive of community management agreed with the full survey group regarding which organizations should have influence in fishery management, with the exception of one organization (university researchers).

Analysis of variance was conducted, comparing people supportive of community management with people not supportive of community management. Significant differences existed for trust in commercial fishermen, the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, State agencies, the U.S. Forest Service, Federal courts, the Governor of Oregon, and university researchers. Significant differences existed for influence with commercial fishermen, the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, State agencies, local governments, local port authorities, tribal governments and national public opinion.

Question 30 Do you think fishery management should be conducted at the community level? [Circle response]

Over half of survey respondents, 52.3%, answered yes, 29.1% responded no, and 18.6% did not respond. Respondents were also given the opportunity to explain why they did not believe fishery management should be conducted at the local level. Of people who responded, most people believed it was too complex or too large to be handled at the community level (Figure 5.11). As mentioned in the introduction to this chapter, this

question was used as the basis for further analysis describing people who were supportive of community management. People who answered yes to this question were assumed to be supportive of community management.

Question 30a Would you be willing to participate in community-level fishery management efforts (e.g., attend planning meetings, participate on watershed councils, etc.)? [Circle response] How? [Open-ended]

Of all survey respondents, 25.1% said they would be willing to participate, 45.8% said they would not, and 29.1% did not respond to this question. Of the respondents supportive of community management, 40.2% said they would be willing to participate, 56.8% said they would not, and 3.0% did not respond (Figure 5.12).

Analysis of variance indicates a significant difference between respondents supportive of community management and respondents not supportive of community management with regard to whether respondents would participate in community-level fishery management.

People were given the option of explaining how they would participate in the community management process. Of the people who supported community management *and* said they would be willing to participate, 39.6% said they would attend meetings, 11.3% each said they would help with environmental projects and volunteer (general), 7.5% said they would provide input (interpreted as more actively participate in the process), and 30.2% responded non-specifically (miscellaneous responses). The distribution for participation of people supportive of community management was very similar to that of the entire survey (Figure 5.13).

Question 30b How should the community raise revenues to support community-level fishery management? [Rank top three choices]

Respondents were given a list of choices that included: property taxes, local taxes, local sales tax, user fees, donations, bonds, state or federal grants, and other, with space to specify if other was selected. People were then asked to select three and rank their choices. Looking just at the respondent's first choice, the selection of how the community should raise revenues was similar between all survey respondents and people supportive of community management. The majority said user fees should be collected to raise revenues, with "other" given as the next most common response. Often people did not specify how revenues should be raised when they selected the "other" category, but quite a few people said that how revenues were raised would depend on the specific project (Figure 5.14).

Question 30c How much time would you be willing to volunteer to support community-level fishery management? [Circle response]

Respondents were given a choice of selecting: none, one hour per month, half of a day per month, one day per month, or more than one day per month. The majority of respondents, 39.0% of people from the full survey group and 44.4% of people supportive of community management, said they were not willing to volunteer. However, 29.0% of all survey respondents and 44.4% of people supportive of community management were willing to volunteer some time (Figure 5.15).

Analysis of variance indicates a significant difference between respondents supportive of community management and respondents not supportive of community

management with regard to the amount of time respondents would volunteer to support community management efforts.

Question 30d How much would you be willing to pay to support community-level fishery management? [Circle response]

Respondents could select from: none, one dollar per month, five dollars per month, ten dollars per month, twenty dollars per month, or more than twenty dollars per month. The majority of respondents, 31.6% from the full survey group and 37.3% of people supportive of community management, answered "none." However, 30.4% of all respondents and 43.4% of people supportive of community management were willing to pay something (Figure 5.16).

5.2 Demographics of Respondents Supportive of Community Management

This section summarizes demographics for respondents who answered yes to Question 30, indicating that they believed fishery management should be conducted at the community level. One hundred and sixty-nine people indicated support for community management.

The distribution of survey respondents from each community varied slightly from that of the full survey group, with only Florence and Bandon changing by more than a few percentage points. Representation decreased for Astoria (-0.8%), Newport (-0.3%), Florence (-5.4%), and Bandon (-2.6%), and increased for Garibaldi (1.1%), Tillamook (1.5%), Depoe Bay (0.3%), Coos Bay (4.0%), Port Orford (0.2%), Gold Beach (0.8%), and Brookings (1.4%).

The majority of respondents, 51.2% are currently employed, compared to 47.5% of all survey respondents. Of people supportive of community management, 5.8% are currently working in fishing or fishing-related businesses, and an additional 8.2% have worked in fishing or fishing-related businesses in the past. People employed in fishing or fishing-related businesses comprise a larger percent of people supportive of community management than of the survey group as a whole.

The majority of respondents, 68.0%, were male, and 30.8% were female, compared with a distribution of 64.4% male and 33.4% female for all survey respondents.

Respondents supportive of community management are slightly younger than all survey respondents, with an average and median age of 59, versus 60 for all survey respondents. However, the most frequent age of respondents was 73, versus 70 for all survey respondents.

The majority of respondents, 73.4% were married, 65.9% of all survey respondents, and 7.1% were divorced, compared to 10.2% of all survey respondents. All other categories (single, widowed, separated, living with partner) were within one or two percent of the full survey.

Distribution of ethnicity was close to the distribution for all surveys, varying by no more than one percent, and with the vast majority of respondents white.

More respondents supportive of community management, 23.7%, had completed high school than from the entire survey group, where 20.7% had completed high school. The percent of respondents who had attended some college, had an associates degree, or a bachelors degree was virtually the same between people supportive of community management and all survey respondents. However, more of the respondents supportive

of community management had not completed high-school (5.9% versus 4.6%), and fewer of them had completed a graduate or professional degree (8.3% vs. 13.0%). Analysis of variance indicated a significant difference in respondent's educational level between people who were supportive of community management versus people who were opposed to community management.

Most respondents, 95.3%, were year-round residents, compared to 92.6% of all respondents, and on average people supportive of community management had lived in their community for 28 years, versus 26 years for all respondents. Fewer people in the had plans to move away (13.0% versus 16.7% of all respondents). Reasons provided for why people would move away was very similar between the two groups, as were the reasons for why people were not planning on moving. Analysis of variance indicated a significant difference in the length of time people had lived in their community between people who were supportive of community management versus people who were opposed to community management.

Mean, median, and mode household income were the same for the two groups. Reorganizing income categories into less than \$9,999, \$10,000-\$24,999, \$25,000-\$49,999, and over \$50,000, people supportive of community management had the same percent of people in the \$50,000+ category, but slightly more people in the less than \$9,999 and \$10,000-\$24,999 category, and slightly fewer people in the \$25,000-\$49,999 category than all respondents. People supportive of community management spent slightly more of their household income (68.7%) in the community than the entire survey population (67.2%).

The first section of the survey asked people about some general community characteristics. On a scale of 1 to 5, with 1 representing "not at all important" and 5 representing "extremely important," survey recipients were asked to identify how important various items were for the future quality of life in their community. They were then asked to rank the top three items. The general selection of quality of life characteristics was the same between all respondents and people supportive of community management. Of this group, 45.6% identified "increasing economic opportunities for local residents" as a top priority for the future quality of life in their community, compared to 39.6% of all respondents. The selection of the second and third most important factors was very similar between the two groups, in general with only a few percentage points difference between specific items.

Figure 5.1
What percentage of people in your community do you believe
are employed in the commercial fishing industry?

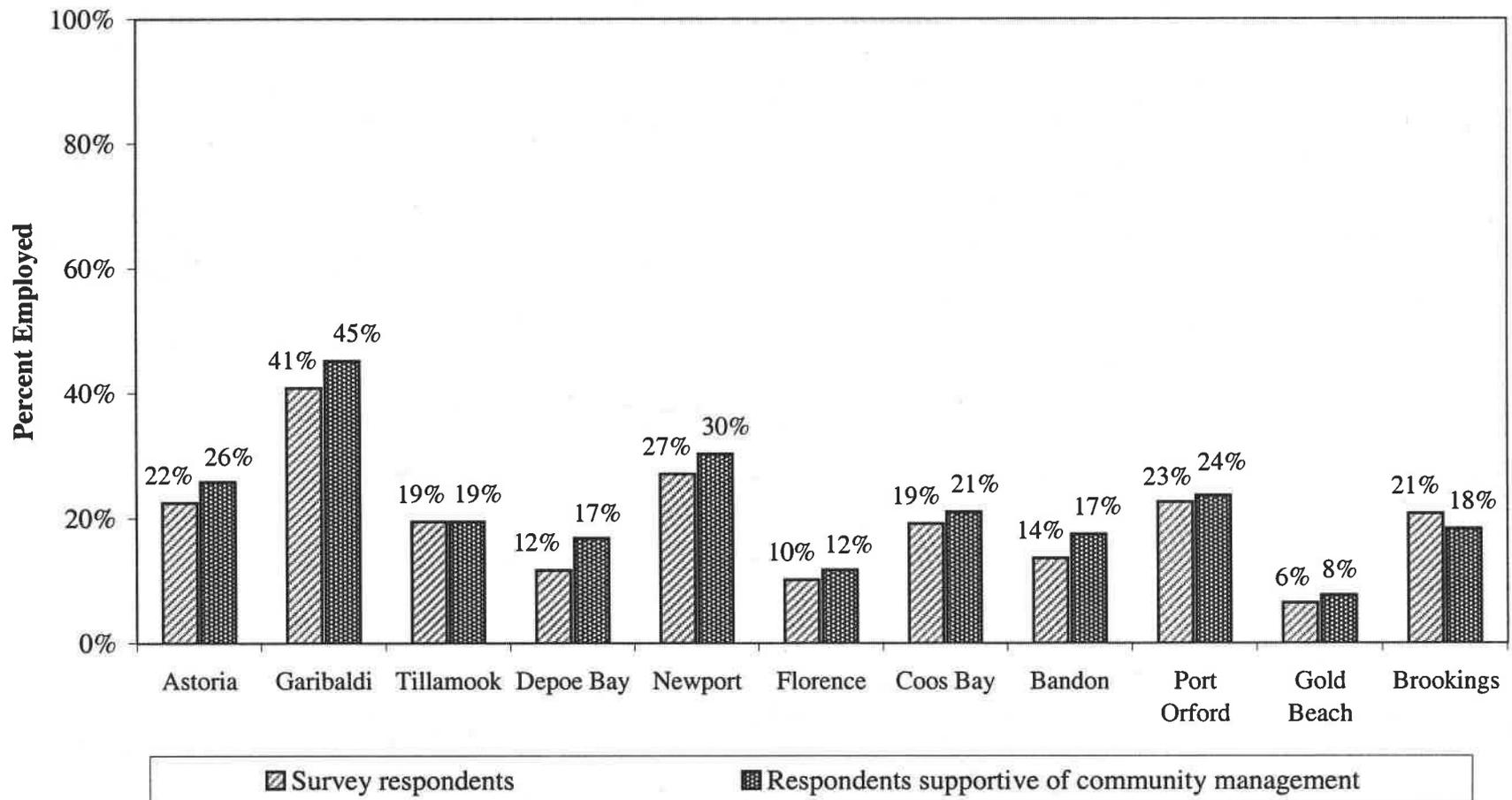


Figure 5.2
Perceived and Actual Employment in
Agriculture, Forestry, and Fishing
(Oregon Economic Development Department 1998 and Survey)

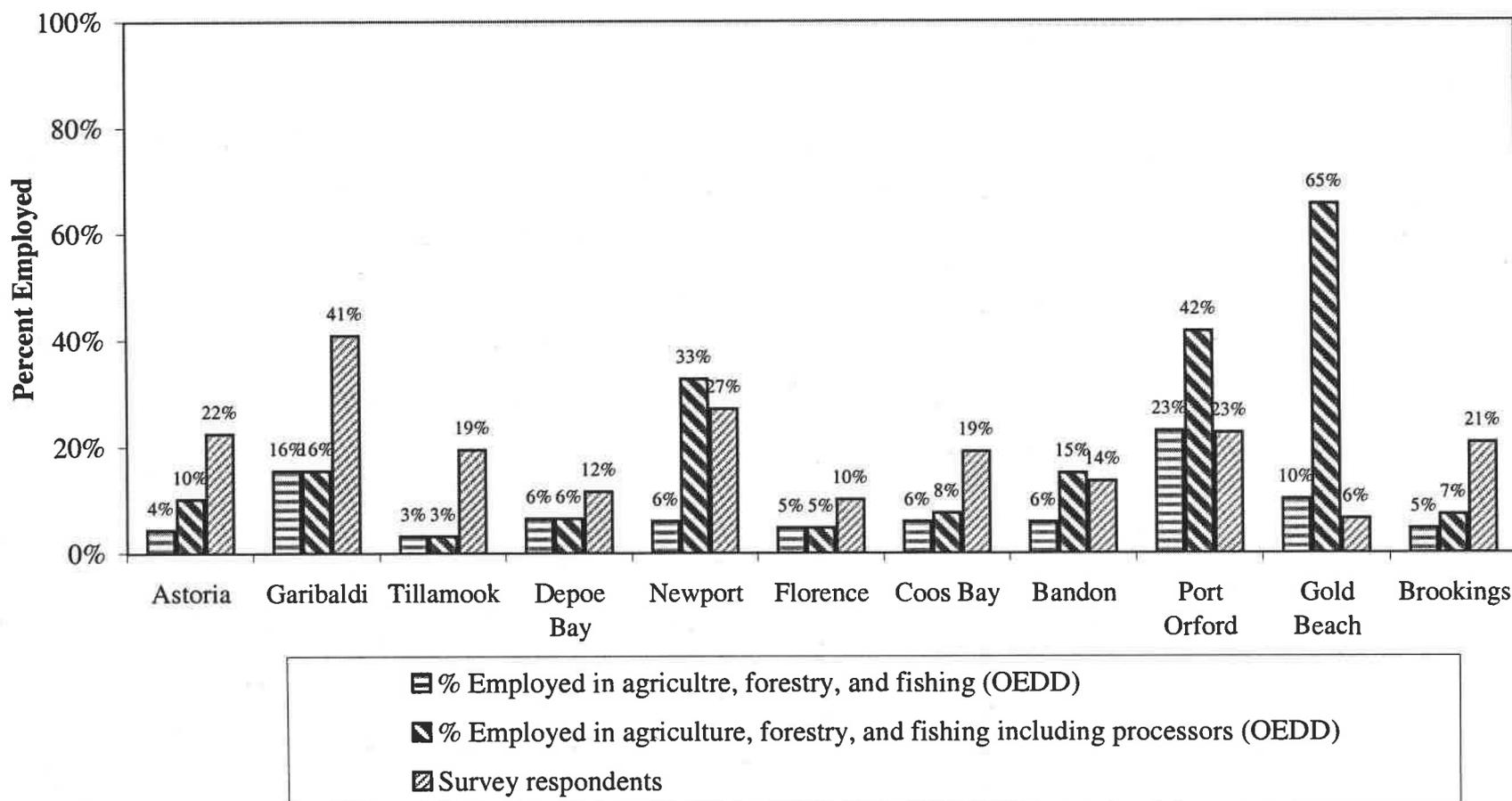


Figure 5.3
Do you see the percentage of people in the commercial fishing industry increasing or decreasing in the future?

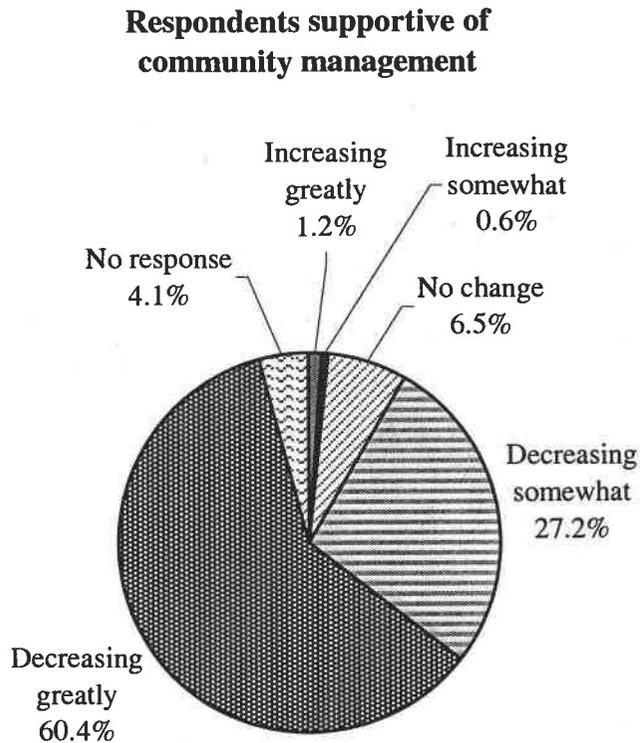
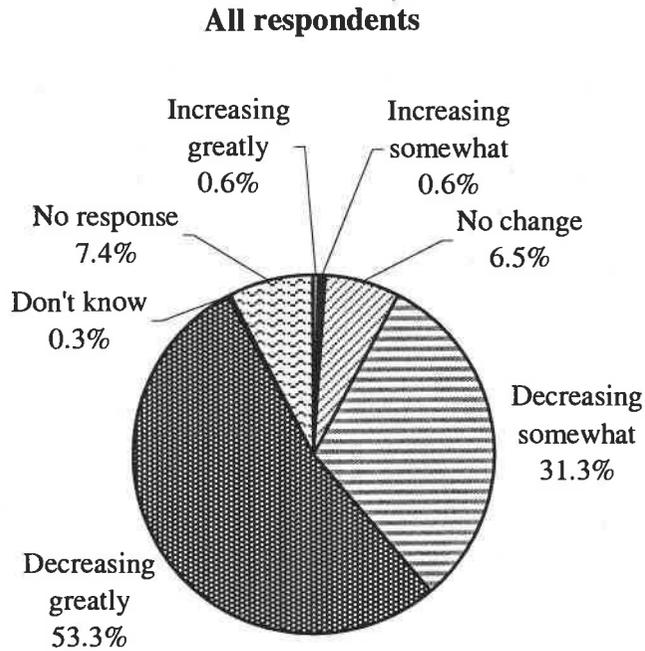


Figure 5.4
Why do you think the commercial fishing industry is changing?

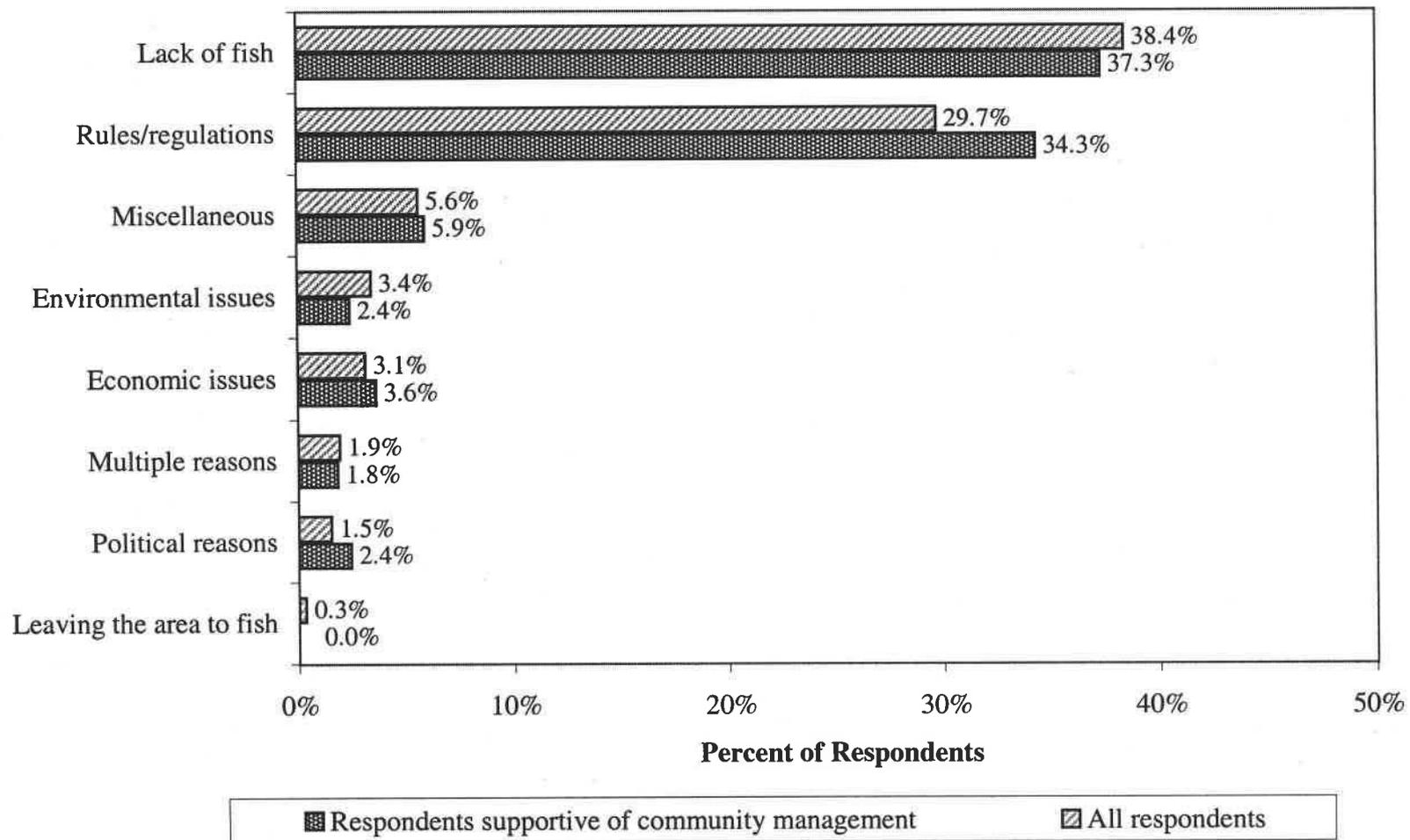


Figure 5.5a
Importance of Commercial Fishing
All respondents

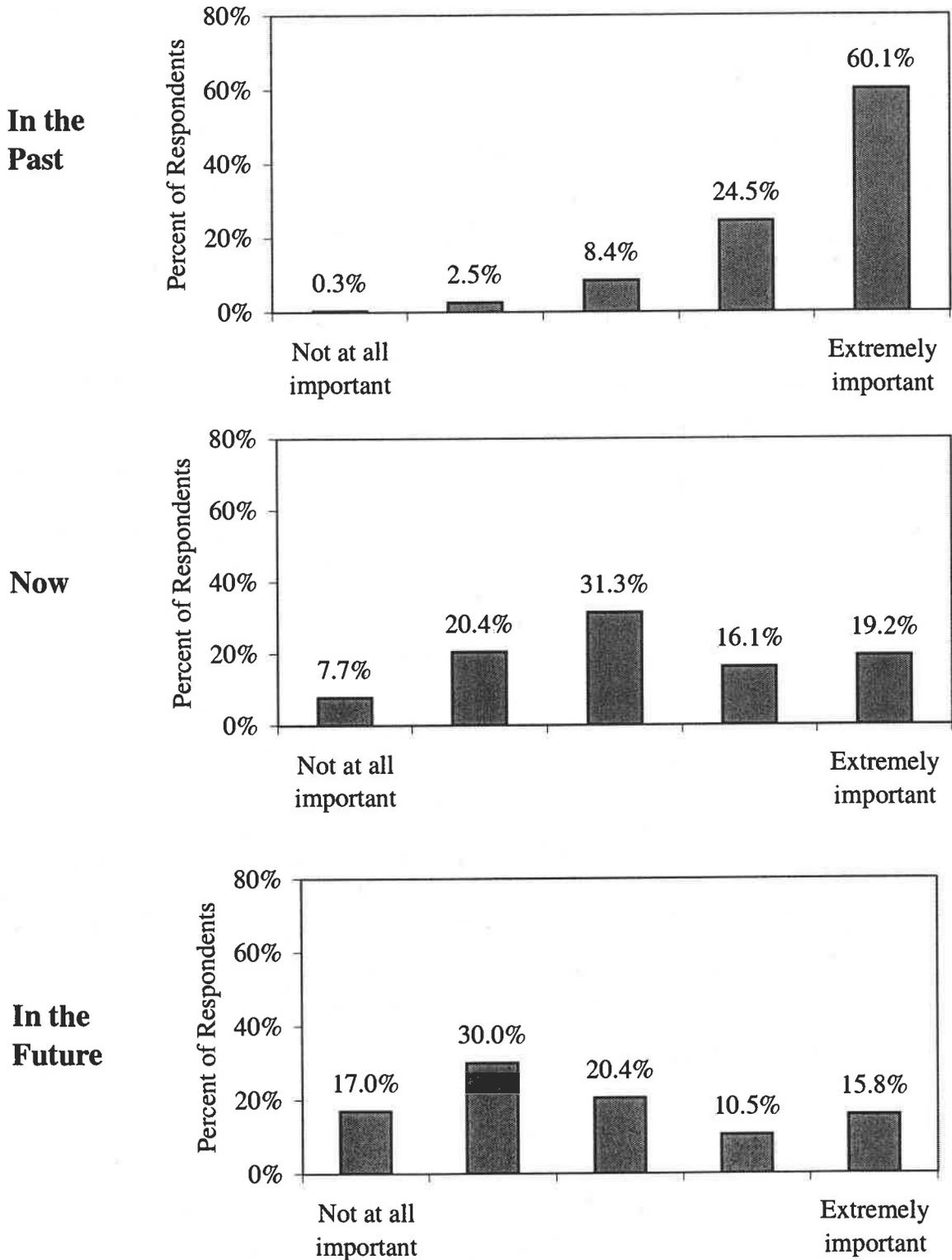


Figure 5.5b
Importance of Commercial Fishing
 Respondents supportive of
 community management

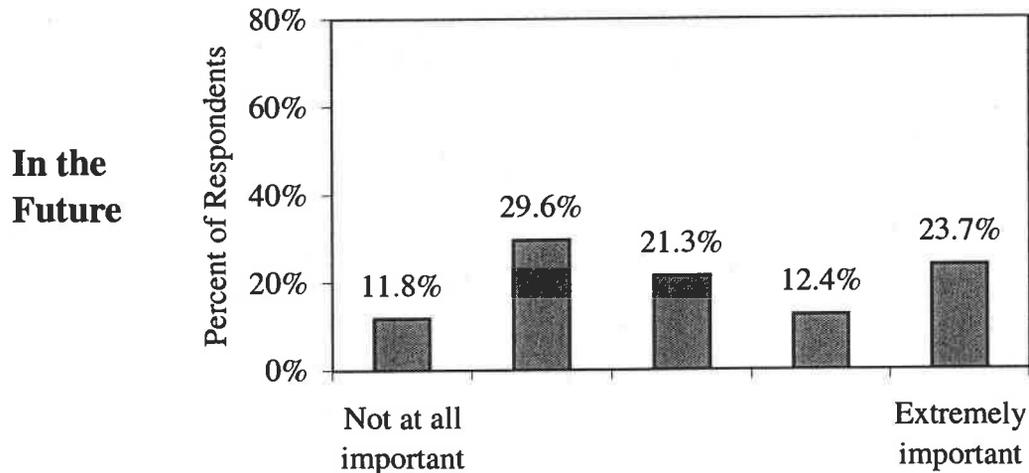
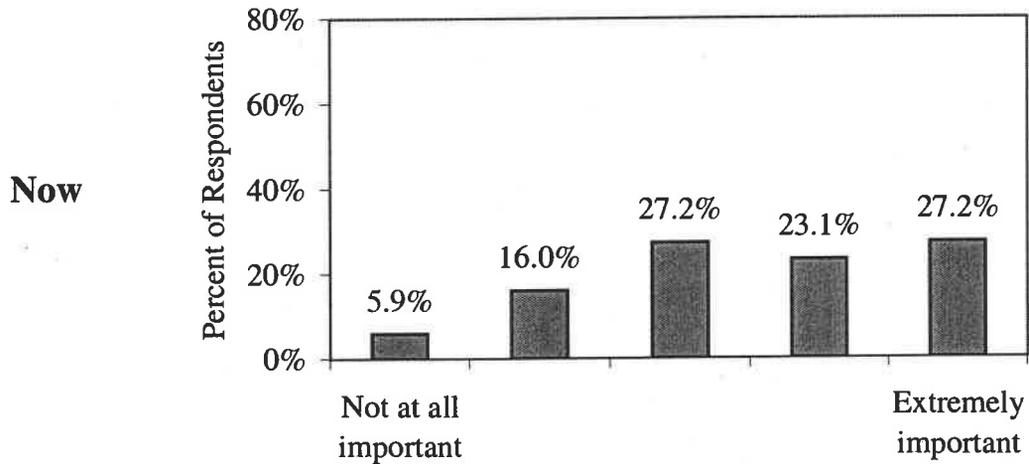
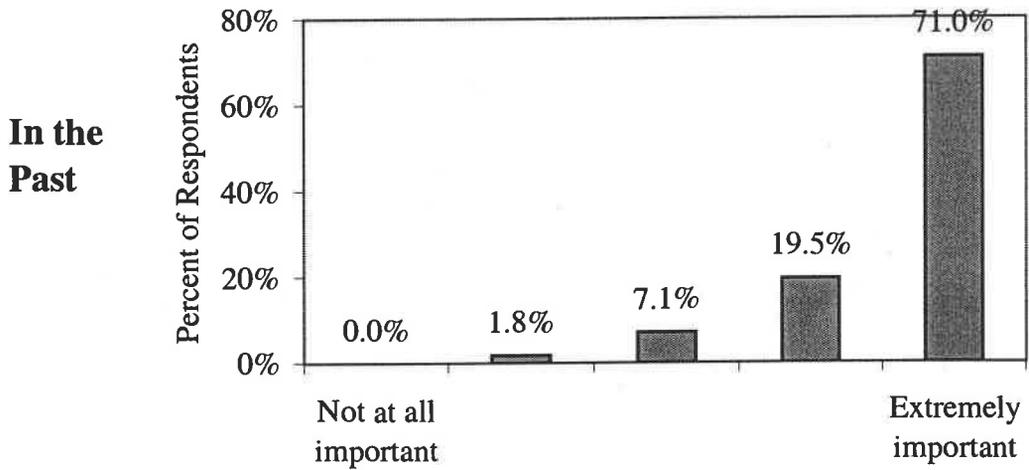
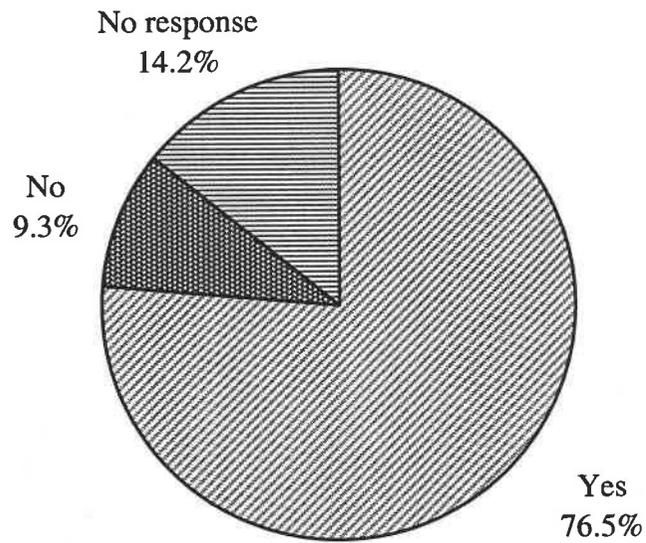


Figure 5.6
Should your community try to maintain the commercial fishing heritage of the area?

All respondents



Respondents supportive of community management

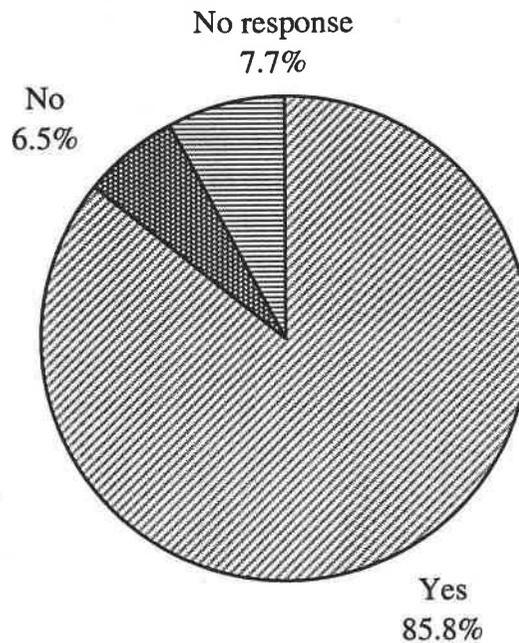


Figure 5.7
How should the community maintain its commercial fishing heritage?

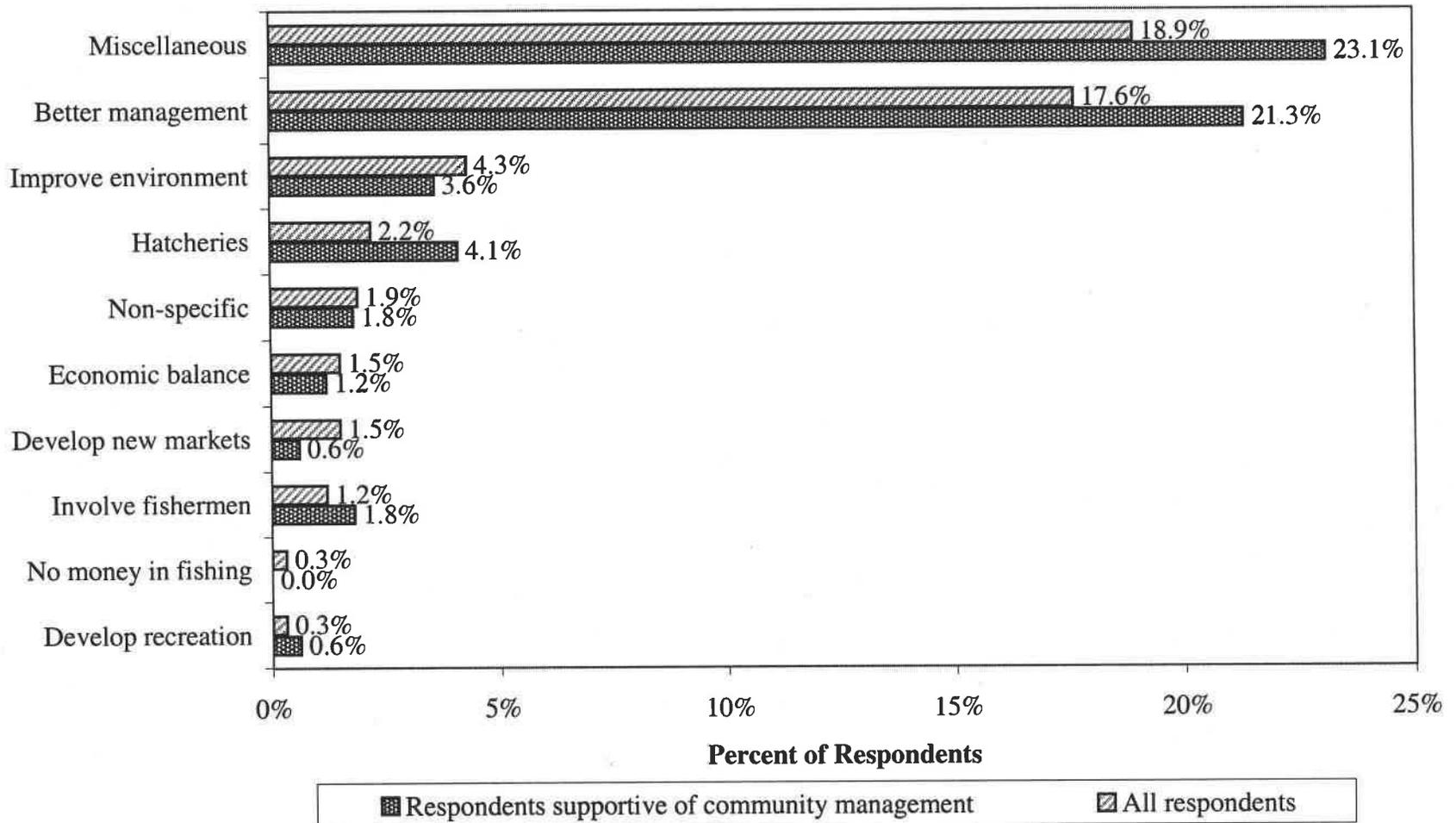
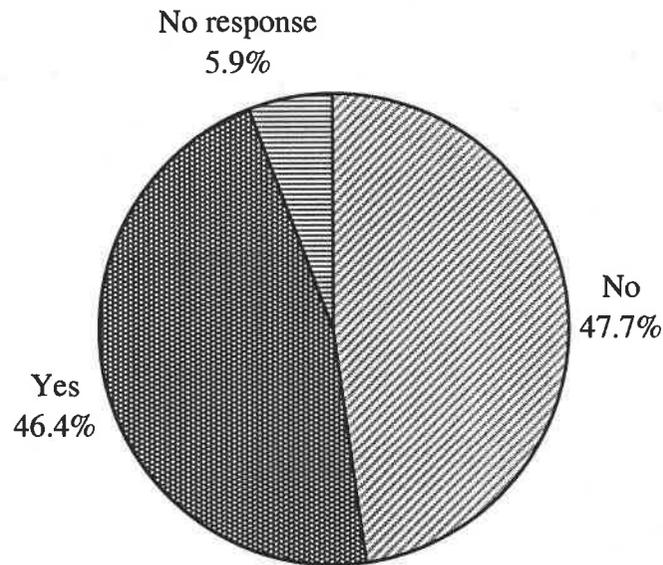


Figure 5.8
Are you familiar with fishery management activities in your area?

All respondents



Respondents supportive of community management

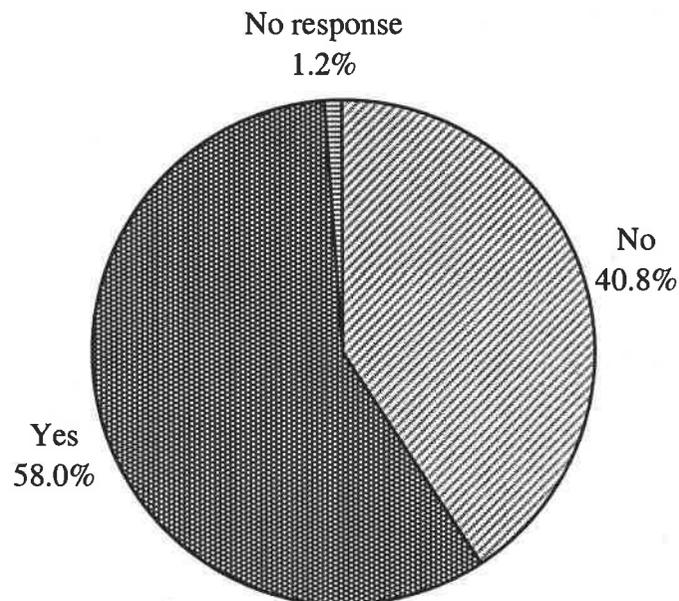


Figure 5.9
How frequently have you participated in the fishery management process in the past?

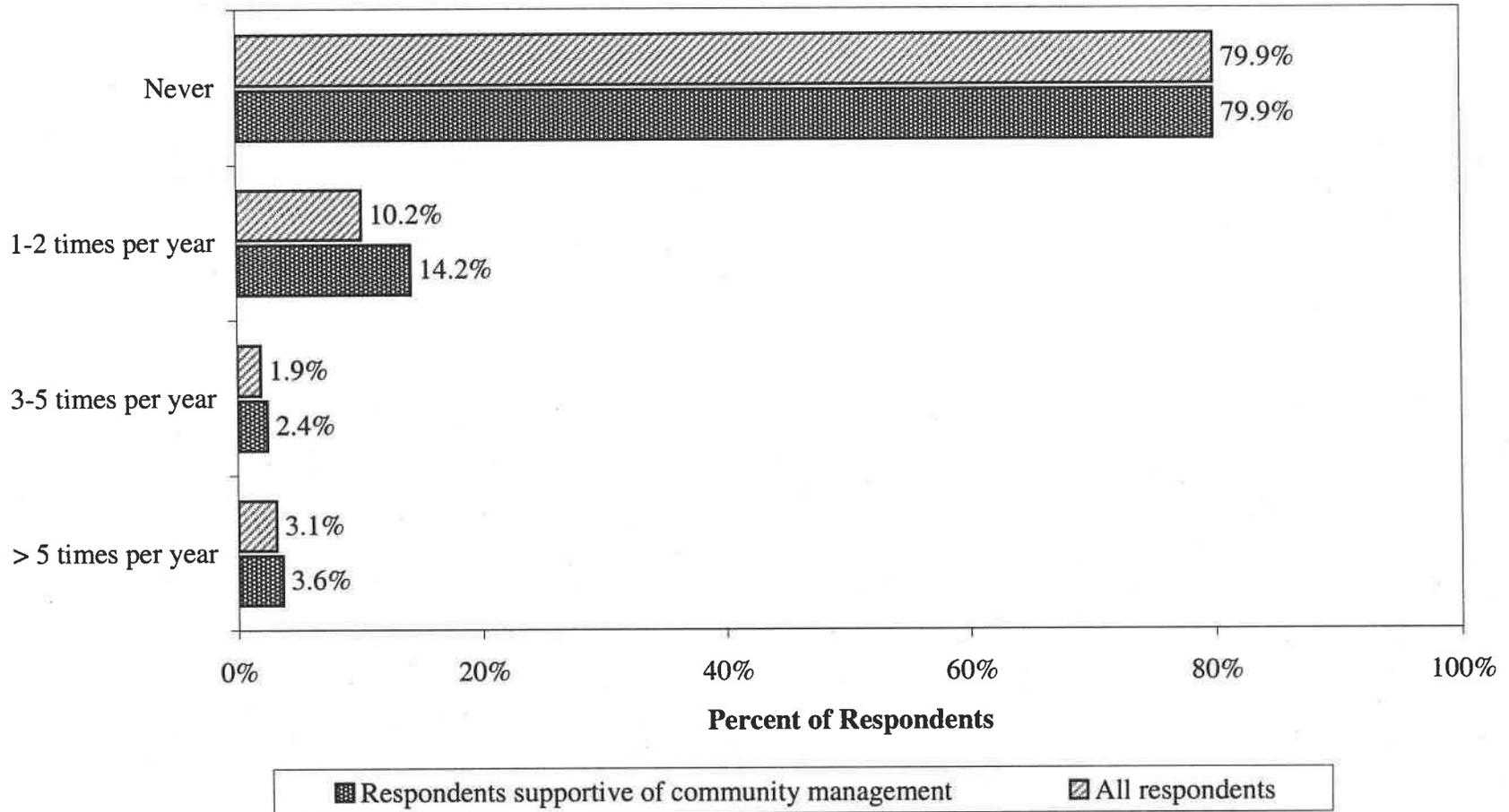


Figure 5.10
What would be a realistic role for the general public in fisheries management?

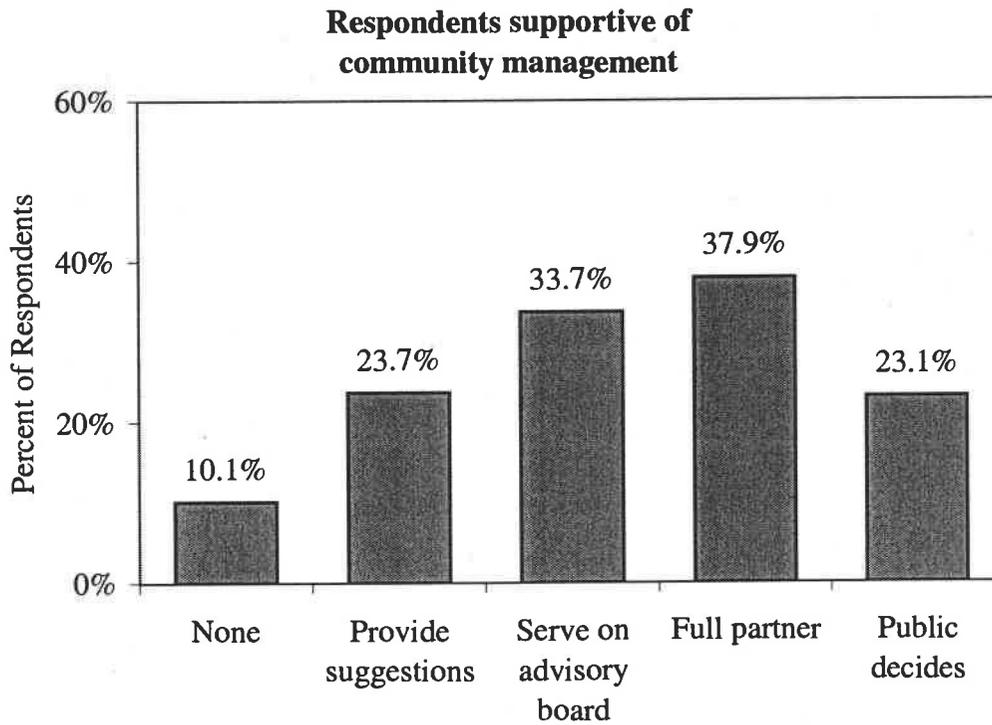
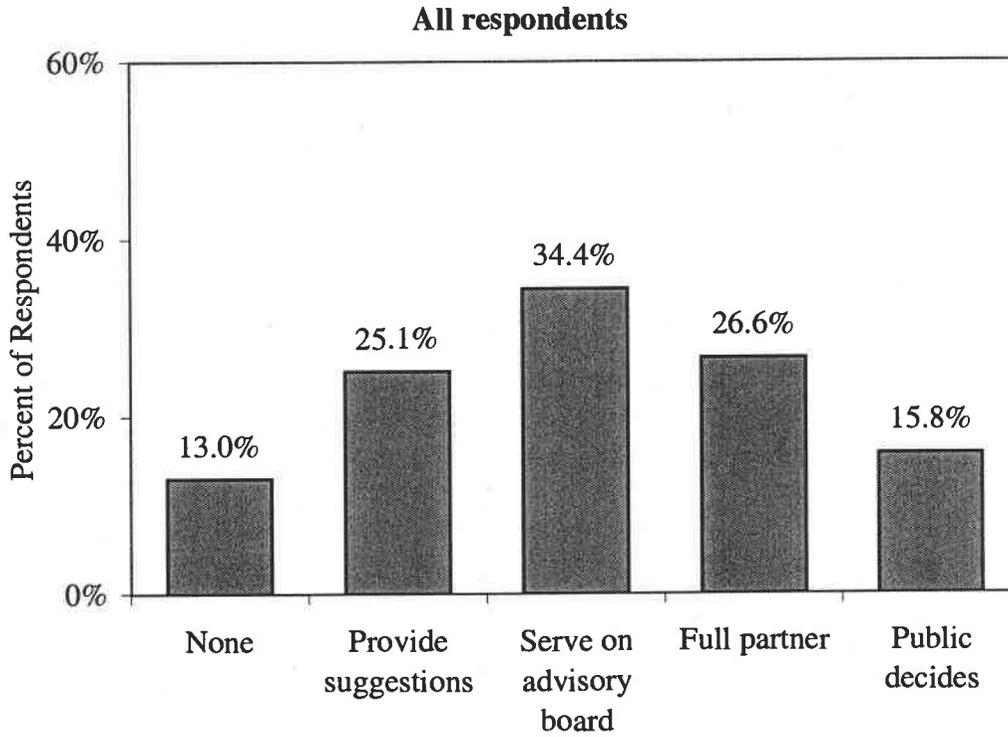


Figure 5.11

Do you think fishery management should be conducted at the community level?

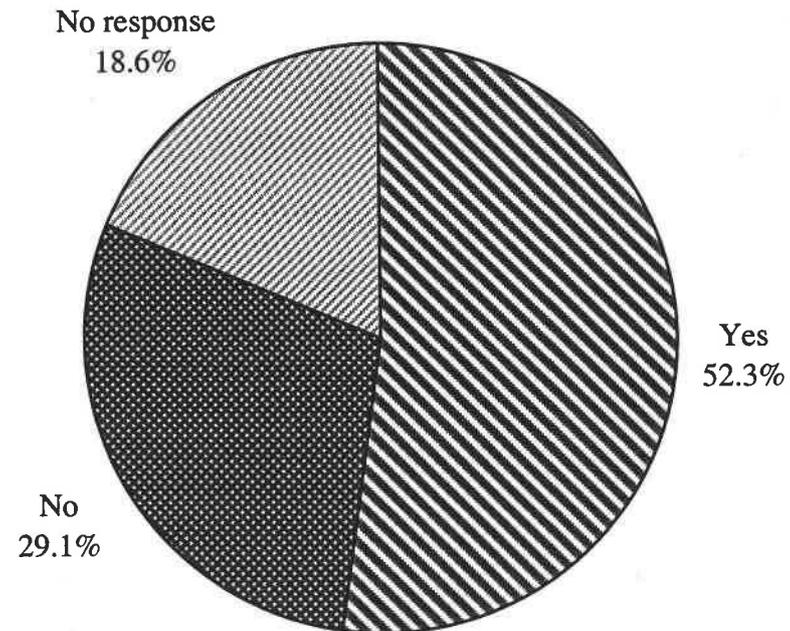
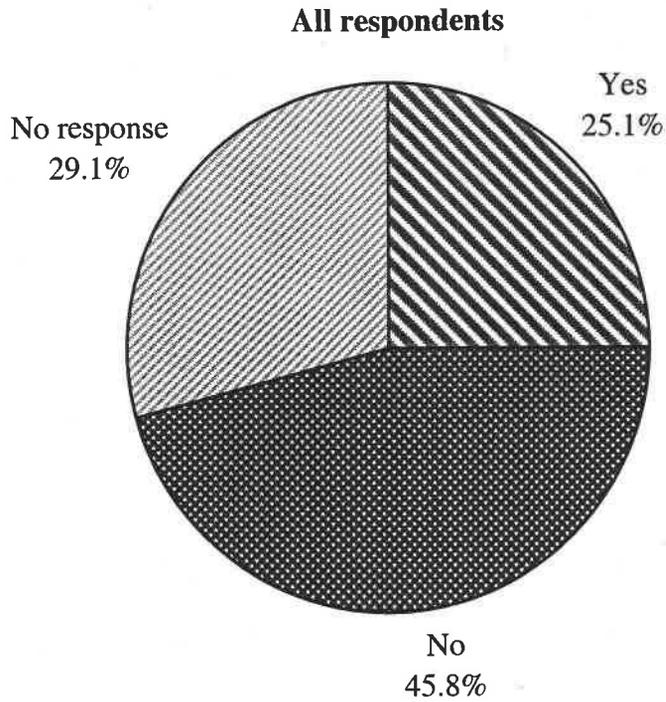


Figure 5.12
Would you be willing to participate in community-level fishery management?



Respondents supportive of community management

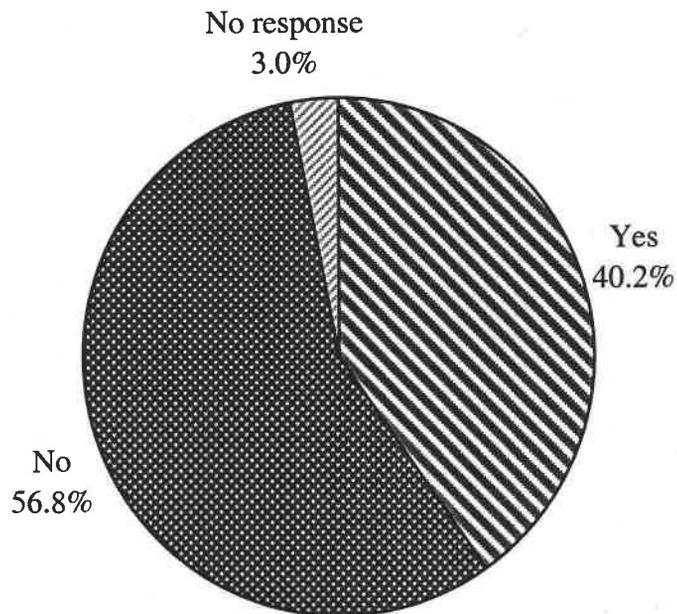


Figure 5.13
How would you participate in community-level fishery management?

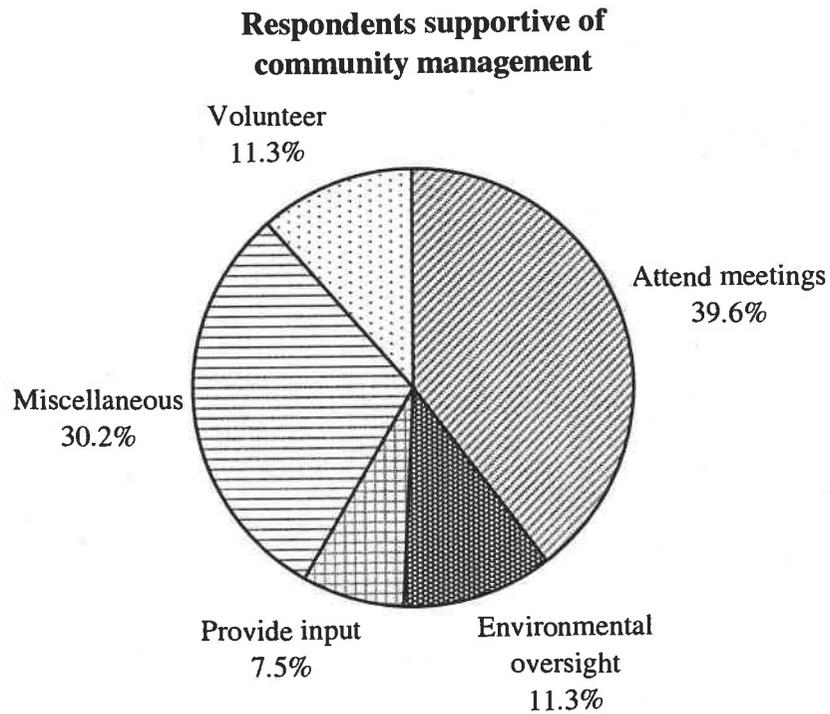
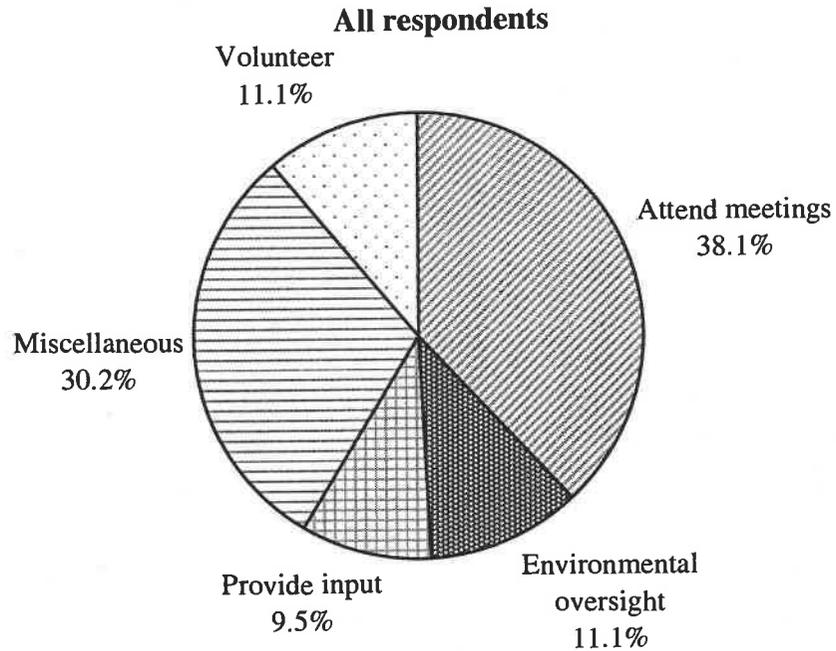


Figure 5.14
How should the community raise revenues to support
community-level fishery management?

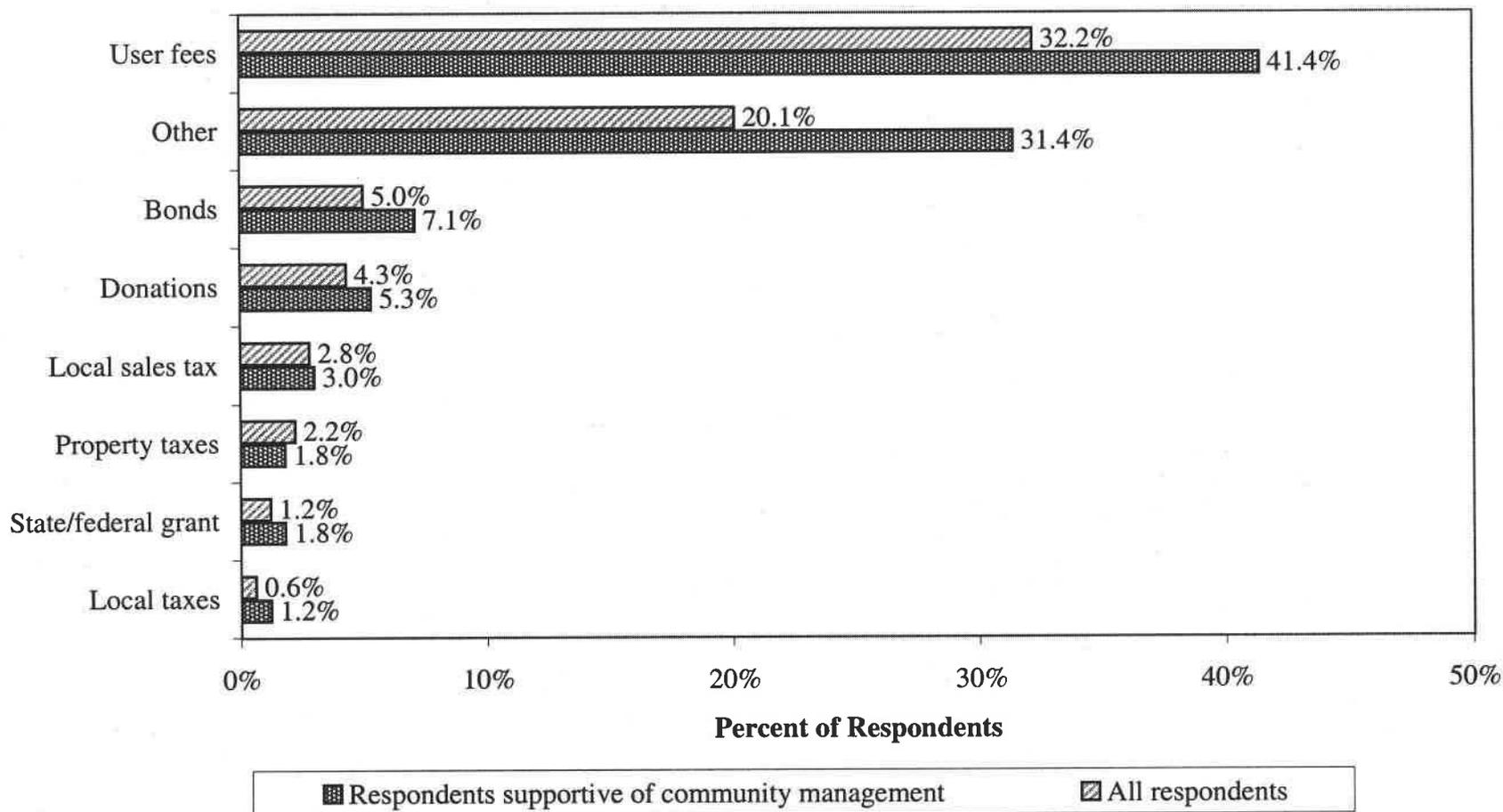


Figure 5.15
How much time would you be willing to volunteer to support
community-level fishery management?

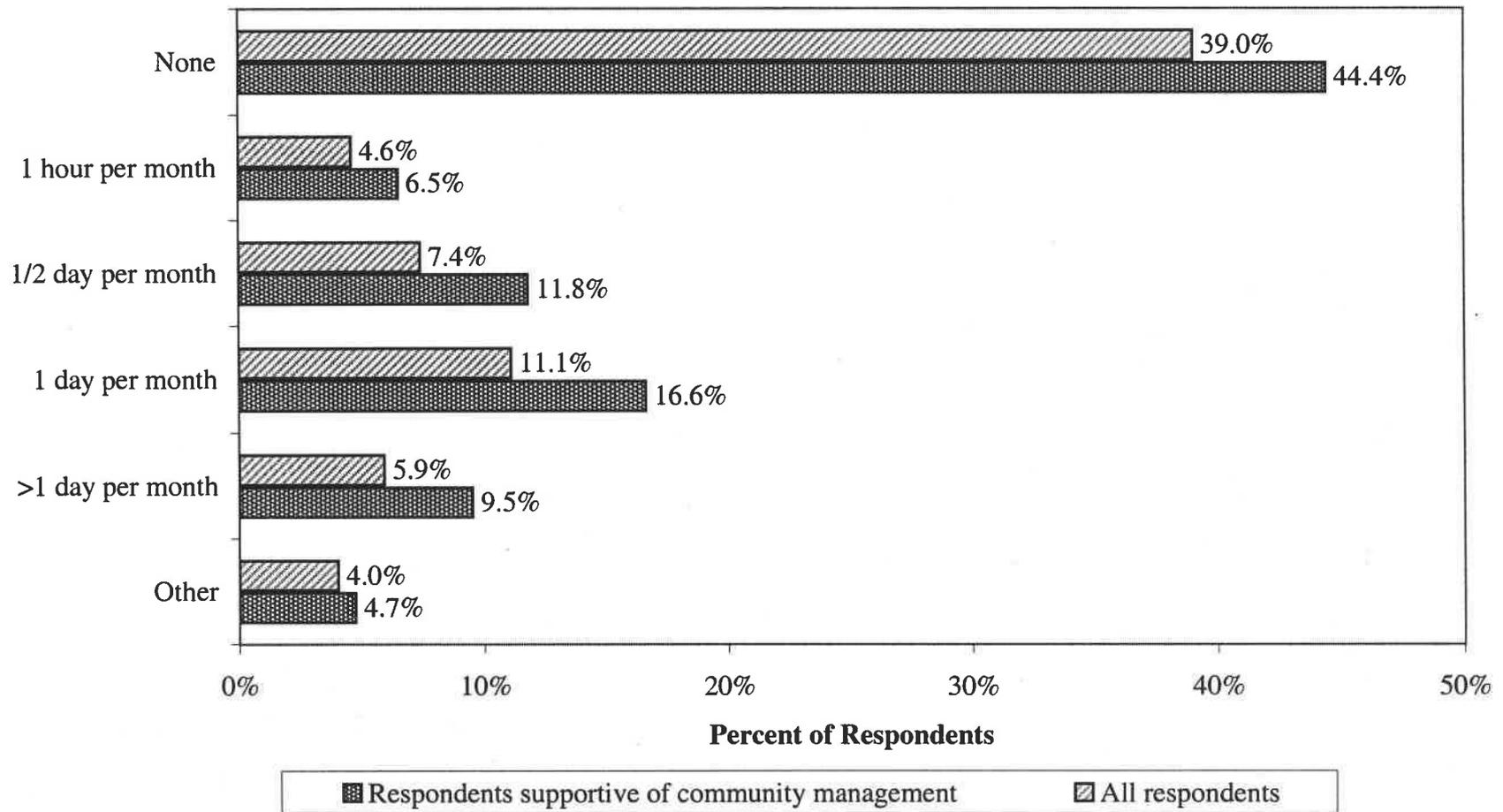
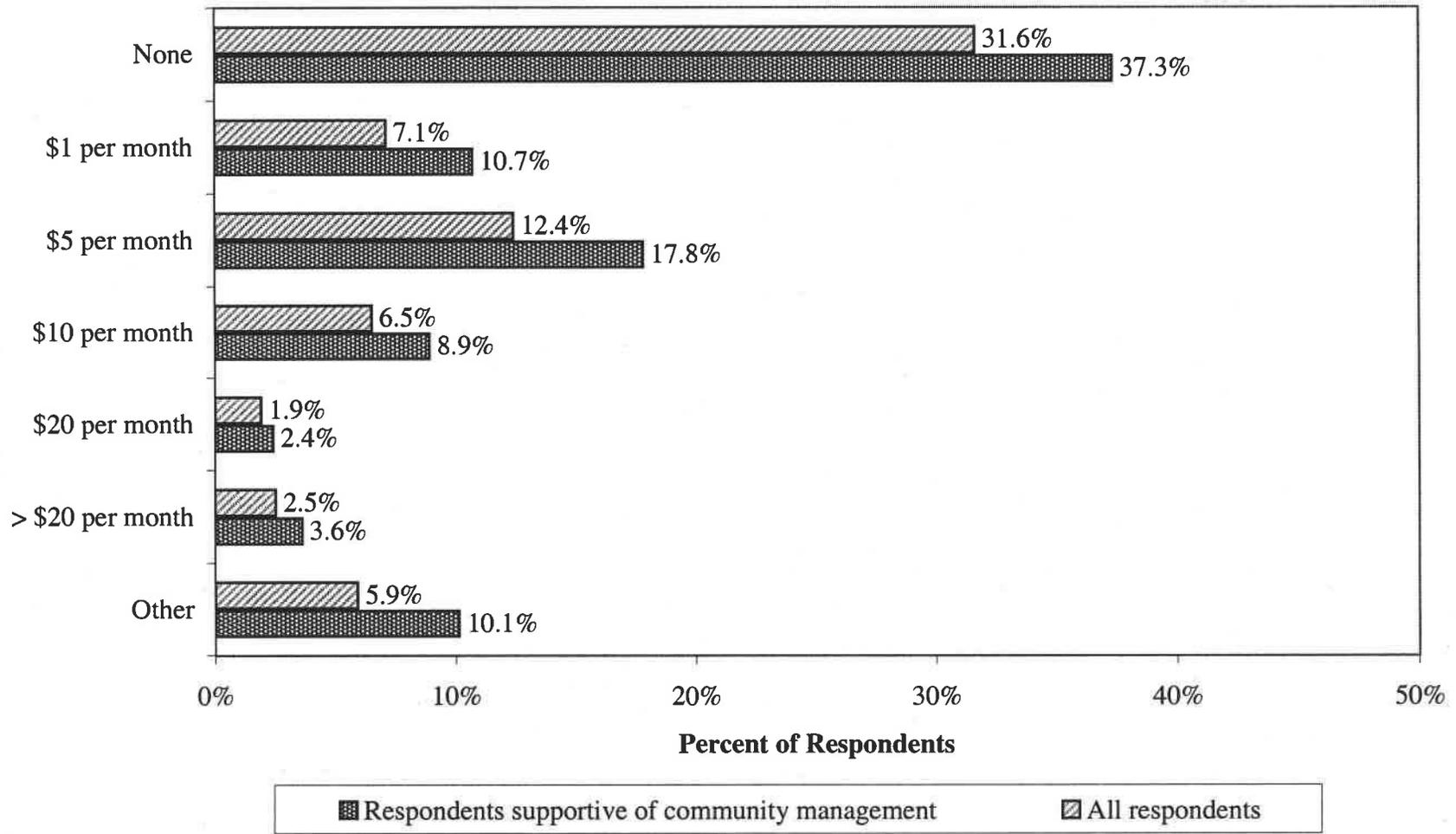


Figure 5.16
How much would you be willing to pay to support community-level fishery management?



CHAPTER 6

DISCUSSION

"If one word could be used to describe the essence of the Northwest, it would be 'fishing.' I believe that all efforts should be exerted to assure that a viable fishery is maintained for future generations of the Northwest."

"Make some effort to support fishermen and fish plants at basic levels (not lip service)."

"[The commercial fishing industry is decreasing greatly because] restrictions, quotas, fishing seasons, weather, high cost of boat maintenance, insurance, etc. - stupid fishing regs and rules - such as: you can't catch a certain type of salmon - taking away the salmon fishing all together, forcing the overfishing of a bottom fish (cod - halibut - which takes 20 years to mature - and salmon takes only 4 years). Stupid regs made by people not in the business."

"Shoot the ecologists and the desk people that don't realize what's going on in the real world."

"The little man can't make a living anymore with the expenses involved anymore and then there are all the limitations and restrictions imposed."

"[I would be willing to participate in community-level fishery management efforts] to maintain good relationships and understand environmental connections to the fishery."

"[The community should maintain its commercial fishing heritage because] its good for the economy."

"[The community should maintain its commercial fishing heritage by] not turning over facilities and port properties, etc. to tourism interests."

These are comments made by survey respondents. It is not a random selection of comments, but statements that illustrate people's feelings about commercial fishing and their frustrations with fishery management. Some of the commenters show a concern for the resource and indicate a willingness to work to protect the resource. Others reflect anger at the current situation and a sense of helplessness. Some people appear to be open to the idea of community management, willing to work with other stakeholders to

develop a management program where biological, social, economic, and cultural objectives can be considered in tandem. Most of all, these comments reflect the complexity of viewpoints and the challenge of designing and implementing a successful community management program.

The purpose of this research project was to determine if community management could be a viable approach to fishery management in Oregon. Two research questions were specifically addressed through the survey. They were:

- 1) Are coastal residents amenable to the concept of community management and would they support a community management approach?
- 2) Who are the people who support community management, and in what ways do they differ from the full surveyed population?

Based on responses to survey questions and exploration of the community management literature, it is now possible to make a preliminary evaluation of the potential for community management in Oregon. The first section of this chapter will review aggregated response to the commercial fishing section of the survey. The second section will discuss specific characteristics of successful community management programs, as discussed in Chapter 3, that apply to Oregon. Finally, this chapter and this paper will conclude with an overall assessment of implementing community management in Oregon.

6.1 Survey

The commercial fishing component of the survey could be divided into three main sections: the first designed to elicit respondent's beliefs about the importance of

commercial fishing, the second to learn if people were aware of or involved in fisheries management, and the third whether fishery management should be conducted at the community level. Each section will be discussed in reference to its relevance to community management.

6.1.1 Importance of Commercial Fishing

Community members are the driving force behind local planning decisions and economic development decisions. Local government officials and business leaders are also instrumental in community decisions. The commercial fishing industry requires local infrastructure, for example waterfront access and port maintenance. If the community at-large does not care about the commercial fishing industry and does not believe it provides valuable services to the community, the community may make economic development and planning decisions that are counteractive to the needs of the fishing industry. For example, most of Oregon's coastal communities are tourist destinations. If a community decides to develop a quaint waterfront tourist attraction, that space is not available for use by the fishing industry. If the community puts funds into developing a shopping center instead of port enhancement, the fishermen may not have the space and services they require. If the community believes the commercial fishing industry is a valuable contribution to their economic, social, and/or cultural structure, then the chances of compatible community-fishing industry activities would improve.

This set of questions, 22 through 25, asked respondents about employment in commercial fishing, future changes in the industry, the importance of commercial fishing to their community, and whether the community should maintain its commercial fishing

heritage. Although people overwhelmingly believed that commercial fishing had declined and would continue to do so, respondents still believed that the industry employed a significant number of people, was an important part of their community's heritage, and should be maintained. The response to this question reinforces the belief that people in Oregon's coastal communities are strongly tied to fishery resources. Although the industry is declining in importance as resource-dependent ways of life are replaced with service and high-tech industries, people seem to want to maintain the character and culture of commercial fishing in their communities.

Strong public support for fishing is an important first step for establishing community management of fisheries. If the stakeholders do not care about the resource or do not receive some benefit from its maintenance, there will be no incentive for them to work for its improvement. Obviously, fishermen need to support the community management process because they are the people most directly affected by a change in management. Similarly, fish processors and deck hands are also influenced by how management affects the fishing industry – if the fishing industry declines, processing plants will close down, and jobs in processing and on fishing vessels will disappear. Therefore, processors and deck hands would also have a direct stake in fisheries management, and would therefore have a direct stake in maintaining a viable fishing industry.

It is less obvious why other people, such as community members, educators, local government officials, and environmentalists would want to maintain a viable commercial fishing industry in a specific community. The answers to this set of questions suggest a reason why. People value the commercial fishing industry for its tradition and the

character that it brings to their communities. "A sleepy little fishing village" brings positive images to mind: hard, yet honest work for a days pay, the rugged independence of fishermen, foggy mornings and romantic sunsets, quaint fishing boats moored to creaky, wooden docks, and cozy sea-front cafés where you can go for news about the weather or a bowl of chowder. Whether or not this imagery is entirely true is another issue, but it does attract people to Oregon's coastal communities and it makes them stay. People may move to a community because it is a great place to retire or because there are good jobs in the high-tech industry, but they fall in love with an area because of its personality. I contend that this imagery, created by the tradition of fishing, is a large part of why community members value their fishing culture so highly. The strong desire to maintain this tradition, exhibited in survey responses, is why community members might be willing participants in a community management program.

6.1.2 Involvement in Fisheries Management

For community management to be successful, a variety of people must work together. Although community management can take a wide variety of forms, from minimal community involvement to pure community control of a resource, it was assumed that a community management program in Oregon would be a cooperative effort between the government and the community. The groups of people involved in community management of fisheries can also vary: the process can be limited to commercial fishermen and government managers, or it can extend to community members, environmental organizations, schools, and tribal governments, to name a few. All stakeholders must be willing to work together toward a common goal. However,

sharing a common goal is not enough. People must understand the complexity of managing a dynamic resource, such as a fishery, and respect other groups' points of view, needs, and approaches in order to work cooperatively and have a chance of achieving that common goal.

As discussed above, the public values commercial fishing. However, are they aware of how fisheries are managed and of the variety of external organizations that influence management? And can they learn to trust and work cooperatively with other stakeholders? Question 26 through 29 were intended to obtain information about respondent's involvement in fishery management and their awareness of the organizations that influence fishery policy. Approximately half of the survey respondents were familiar with fishery management activities, although considerably less had actually participated in the fishery management process. On average, respondents believed the public should have some involvement in the fishery management process, but the level of involvement differed between the full survey group and people supportive of community management. People supportive of community management endorsed a more active role for the public in fishery management decisions, believing in equal partnership with resource management professionals or that the public should be able to make management decisions independent of resource professionals.

The last question in this section asked people about their degree of trust in and how much influence various organization should have in fisheries management. Survey respondents identified organizations with current responsibility for fishery management (U.S. Fish and Wildlife Service, National Marine Fisheries Service, the Pacific Fishery Management Council, and State agencies) and believed those organizations should have a

high degree of influence in fishery management. Respondents also identified local organizations, including local government, local port authorities, watershed councils, and commercial fishermen as groups that should have influence in fishery management decisions. The public had a very high degree of trust in commercial fishermen and believe fishermen should exert a great deal of influence in fishery management. The responses to this question showed an awareness of the role of external organizations in fishery management. The public does recognize that there are national and state level organizations that have knowledge in fishery management that should be considered when making management decisions. However, there is also strong sentiment that local people and organizations have much to contribute.

This information is important for several reasons. First, it shows an awareness of how management is currently conducted, and the potential for a greater awareness of the complex biological, economic, and social factors involved in resource management decisions. Taking this awareness one step further and determining ways to increase local participation and improve the management process may not be as difficult as if the public were entirely ignorant of the process. However, many people have not participated in fishery management, so some education would need to be done to teach them about the process. Second, survey respondents believe the public should be involved. Third, respondents believe a variety of organizations should have influence in the management process. Because of this recognition, pulling together the various stakeholders may not be overwhelmingly difficult. However, there are other organizations, such as environmental organizations, who were not listed in the survey, and tribal governments, where trust and influence factors were low, that may need to be included in the process.

Regardless of the amount of trust that exists, the actual process of dividing responsibility and authority between so many organizations is guaranteed to be challenging.

6.1.3 Support for Community Management

Public support for community involvement in fishery management is crucial.

Survey results show that people do believe there is a role for the general public in fishery management. This section of questions, question 30 parts a through d, specifically asked people if they thought fishery management should be conducted at the local level, whether they would participate, and how they would participate.

Results indicated that coastal residents in Oregon are supportive of community management, and moreover, that they would be willing to participate in a community management process. Although the majority of respondents said that fishery management should be conducted locally, a significant portion said that fishery management should not be conducted at the community level. "Community management" was not defined in the survey, and it is possible that *both* groups of respondents – supporters and opponents of community management – may not completely understand it. Many of the people opposed to community management commented that management was "too large" or "too complex" to be handled at the local level. This indicates an understanding of the larger scale of fisheries – fish travel as do fishing boats, and, at least in Oregon, it is not realistic to limit management to small, quasi-isolated communities. Management is a process that must consider a variety of scales, from port-to-port to country-to-country. What these people may not realize is that the flexibility of community management allows responsibilities to be shared in the most

effective manner. For example, a local cooperative is probably more qualified to handle allocation within their port area, while the regional council or federal government is more qualified to handle allocation between states or countries. Conversely, some people who supported community management may have been under the impression that the government would turn all aspects of management over to local groups, and 'leave them alone,' and as already discussed, it is unlikely that would occur.

Twenty-five percent of the full survey group and 40% of people supportive of community management were willing to participate in a community management program. Similarly, a large number of people were willing to volunteer time and money to community management efforts. Although the actual number of people may decline when the time came to participate, the strong response to these question indicate that people would take community management seriously. A number of people commented that whether they volunteered time or paid money to support community management would depend on the type of projects being undertaken and how the money was spent. This reinforces the statement made earlier that public support is necessary. Effort will need to be expended to make community management successful. If the public is involved in the process, understands the benefits of community management, and believes those benefits are worthwhile, they are more likely to support.

6.2 Is Community Management Feasible in Oregon?

People believe the fishing industry is important in their communities, they are aware of fishery management activities, have a basic level of understanding and trust in the various groups with current management responsibilities, and are willing

participants in community-level efforts at fishery management. Is this enough? In Chapter 3, community management literature was reviewed. That review described characteristics that would increase the likelihood of community management success. This section briefly reviews those characteristics and discusses whether those characteristics are met in Oregon. The characteristics of success identified by Jentoft (1989) and Pinkerton (1984), organized into logistical, cost sharing, and political categories, are:

- Logistical
 - Limited scale of jurisdiction and membership
 - Clear boundaries
 - Clear membership criteria
 - Interception agreements
 - Local all-stakeholder co-management boards
 - Coordinating regional management board
 - Homogeneity
- Cost sharing
 - Cost recovery
 - Additional benefits of cooperation
 - Local volunteers
- Political
 - Tradition of cooperation
 - Legal authority
 - Clear definition of local authority

Looking over this composite list, many of the items could be dealt with in the planning and designing of a community management program. Ideally, a community management program would have been already initiated, legal authority vested, and interested parties identified and working in a spirit of cooperation *before* electing regional board members, defining jurisdiction, boundaries, and membership, and developing additional functions for the cooperative.

However, a few of the characteristics, specifically homogeneity, a tradition of cooperation, and legal authority, do have applicability to whether community

management could be successful in Oregon. Each of these will be discussed in turn.

First, homogeneity. The fishing industry has existed in Oregon for many years. During that time, many different fisheries have developed, with different boat sizes, gear classes, degrees of investment, and economic incentives, among other things. Additionally, there are native populations that also have a federally mandated right to fish. Taking all of that into consideration, Oregon's fishing industry could not necessarily be called homogenous. However, many of the different groups are already organized, often by fishery or gear type, and speak with a united voice at Pacific Fishery Management Council meetings. Although the various groups have different interests and agendas, some organization does already exist. The heterogeneity of the fishery could make designing a community management program that encompassed all fisheries difficult, but if community management is designed on a fishery-level or gear-level basis, these pre-arranged organizations could help the process.

The second and third characteristic of success of interest is whether a tradition of community management exists and whether a legal framework exists. Community management of fisheries is not an entirely new concept to many Oregonians, and two examples show this: Oregon's salmon recovery efforts and marine fisheries management through the Pacific Fishery Management Council (PFMC).

6.2.1 Salmon Recovery

The most recent and well-advertised form of community management in Oregon is involved with the restoration of endangered salmon populations. Oregonians are strongly tied to salmon economically and culturally. Written on the back cover of Joseph

Cone's 1995 book, *Endangered Salmon and the People of the Pacific Northwest*, was the powerful statement, "Salmon are the soul of the Pacific Northwest, a cultural cornerstone of the region." Although salmon stocks had been in decline for some time, Oregonians did not take action until the Federal government began seriously considering an Endangered Species Act (ESA) listing for salmon. An ESA listing would drastically change fishing, forestry, and farming practices in Oregon, and the threat of those changes encouraged those people to join together to try and develop an alternative to an ESA listing.

As desperate as the circumstances of the endangered salmon appeared, the mid-1990s did offer some hope. Specialists knew enough to begin the work of restoration; the technical problems were the easy ones. What was missing for most people was, first of all, a sense of what was at stake and what they could do, personally. After personal knowledge might come action, and from action would likely come a recognition that the task required working together. The emergence of watershed-based cooperation showed that some people already understood that (Cone 1995: 315-316).

Watershed councils were formed, with representatives from the government, the community, scientists, timber companies, farmers, fishermen, environmentalists, and other interested parties. Developing working watershed councils involved bringing together traditionally opposing groups of people, overcoming stereotypes, and learning how to work cooperatively to meet a variety of biological, economic, social, political, and cultural objectives.

The challenge of developing a renewed sense of community with other people and the environment should not be underestimated. American political life was simply not geared to citizen participation - regular, disinterested, fundamentally democratic participation - in generating the common good. Even if such broad participation arose, it would need to be meshed with capable institutions. Institutions were needed that had the commitment - and, importantly, the authority - to manage the salmon and their ecosystems based on the application of scientific knowledge, learning from doing so, and changing behaviors based on what was learned (Cone 1995: 316).

The salmon recovery activities show that Oregon has an interested population and that a wide variety of people, other than those directly affected by salmon regulations, believe maintaining salmon populations is important. Salmon recovery will take many years – 20 to 50 in some estimates – and so it is not yet clear if community management has been a success. Also, as mentioned earlier, this effort has not staved off an ESA listing. However, even if some salmon stocks are listed as endangered, as is expected, it is likely that many of the components of Oregon's recovery plan will be included in the federal ESA plan. Oregonians, especially coastal residents, are already aware of community management concepts and have previously supported cooperative approaches to resource management. Although relatively recent, a tradition exists for community and multiple-stakeholder involvement in management through the watershed councils. Also, the watershed councils may provide a starting point for determining the devolution of authority to the local level.

6.2.2 Marine Fisheries Management

The cooperative arrangements of the Pacific Fishery Management Council provide another example of tradition and legal framework for community management. The Pacific Fishery Management Council (PFMC), the governing body for marine fisheries management for California, Oregon, and Washington, takes a co-management approach to fulfill its responsibilities. The PFMC is responsible for developing fishery management plans for fishery resources in the U.S. Exclusive Economic Zone off the coasts of Washington, Oregon and California. Plans have been developed for salmon, groundfish, and coastal pelagic species. The Council encourages community

involvement and prides itself on the partnerships that it has formed to manage marine fisheries.

One strength of the council process is the opportunity for public involvement. There are many avenues for public input. Interested citizens may serve as Council members or as a member of the advisory panel. The public is encouraged to testify at public hearings and Council meetings, and public comments are accepted prior to Council action on each issue. Individuals may also submit written comments. Council meetings may not be convenient for many, so state agencies and other entities hold a number of hearings, meetings, and workshops in local areas to obtain grass-roots input on proposed fishing regulations. These meetings are open to all interested individuals. Regulations are adopted at Council meetings, but the ideas for regulations are generated at these local meetings and that is where the process begins (PFMC 1998).

The PFMC, as discussed in Chapter 3, falls into the 'consultative' category of user group-government cooperation. Although the council members include the various stakeholder groups, the wider population of these groups does not have specific responsibility or authority for fishery management design decisions, implementation, or enforcement. However, the current government structure does recognize and encourage user group involvement, and thereby provides an important groundwork by which to base further exploration into community management.

The PFMC has existed for more than 20 years and has a longer tenure than the salmon recovery efforts. However, unlike the salmon recovery efforts, it does not pass planning responsibilities and implementation authority to the local level, which the salmon recovery plan does. However, the PFMC structure does recognize stakeholder interest in management, and provides a political basis for sharing governance and responsibility for management with local interest groups. It is likely that if community management were to proceed in Oregon, that the PFMC would be a key player in

planning and devolving authority to the local level. Therefore, this preexisting recognition for public involvement is very important.

6.3 Community Management in Oregon

Survey results indicate that public support for community management exists. Previous approaches to fisheries management in Oregon have included community-based approaches – a tradition and political acceptability of community management exists. So, does this mean that community management could be a viable alternative to fishery management in Oregon? Possibly. The next step is to examine who would be involved, why would these people participate in community management, at what level could we begin approaching the development of community management, and how could the process be initiated? This section attempts to look beyond the survey results to think about how a community program might be initiated. Many of the issue raised in this section do not have specific answers at this point, but are issues that need to be considered.

6.3.1 Who?

A wide variety of people could be involved in community management. At the most basic level it would need to include commercial fishermen and the government. However, there are many other groups of with interest in community management, including processors, deck hands, fishermen's wives, local government officials, port officials, tribal government, community members, educators, researchers, scientists,

environmentalists, and so on. There are two important questions that would need to be addressed:

- 1) Who should be included so that external opposition is reduced while minimizing the chance of internal conflicts.
- 2) Where should the line be drawn between key players and other interested parties. For example, fishermen have an economic stake in fishery management should they have more responsibility and control than local government officials?

6.3.2 Why?

In Chapter 3 the basic reason for why communities would want to undertake community management is discussed. Community management benefits include control over economic and social development, legitimacy, improved resource information, increased equity, increased flexibility, a more democratic process, reduced conflict, both between gear sectors and between users and the government, and reduced overinvestment. These reasons are overarching improvements that could occur as a result of community management. The benefits are documented in case studies. They explain why society would think community management is a good idea.

Individuals will need to make the sacrifices that make community management a reality, and why would community members, especially fishermen, or government agencies elect to undertake a community management avenue of resource management? Survey results also show that coastal residents highly value the tradition of commercial fishing and believe it should be maintained. People are also willing to devote time and

money to the community management process. Whether all of those people would continue their support when it actually came time to volunteer time and money is another question, but even a fraction of people with the desire to make it work would be a very positive start.

A community management program would require short-term effort for long-term benefits. Many of these benefits would be realized only after a community management program was working. As observed in the literature review, community management programs can take a very long time to develop, and during this process a great deal of effort would need to be expended. Earlier it was postulated that communities as a whole would support community management because of the importance of the fishing tradition. In a community management program, community members would be able to exert some control over the economic, social, and cultural direction that their community followed.

Why would fishermen and fishery managers decide to support community management? For fishery managers, decreased conflict and increased effectiveness of management are likely to be driving factors. Additionally, if managers do not have to deal with small-scale issues of fishery management, they would be able to devote more time evaluating the resource and coordinating improved scientific assessment within the government and also between resource users and the government.

Fishermen are most likely to directly realize the benefits of community management. However, two additional reasons may explain why fishermen would be willing to participate: to maintain the tradition of fishing and to exert better control of their fishing businesses. Although tradition is likely to be important to all fishermen, it

may play a more influential role in why part-time fishermen would participate in community management than business control. As noted in Chapter 4, fishing is an important part-time occupation for many people. Although fishing may make up a small portion of some individuals income, the tradition of fishing may make up a large portion of their identity. Whether these people have an incentive to participate in a community management process will depend, in part, on how each individual values their time (and income that could be earned from another job) versus how much they value maintaining their fishing tradition. The stronger the sense of tradition, the more likely they would be to support a community management program.

Full time fishermen would have a different incentive to support community management. Although the tradition of fishing is probably very important to them, fishing is their primary source of income. The incentive for this group of people would be their ability to influence the management process and make their business planning easier. As a generalization, for the part-time fishermen, fishing may be a nice additional source of income, but for many it may be the independence or the "fun" of fishing that makes them participate. Fishing may be less of a business venture for them than it is for full time fishermen. Although fishing success in a particular season is somewhat decided by fate (e.g., weather), the most successful fishermen are meticulous business people and careful planners. The ability to control more of the day-to-day aspects of fishery management and have better control over management changes may strongly appeal to these people, making the short-term increase in effort to develop a community management program worthwhile.

6.3.3 Where?

One of the most complicated aspects of community management is establishing the appropriate boundaries. Similar to who is involved in community management, the boundaries must be large enough for a cooperative to exist and maintain reasonable control of the resource, but not too large to increase the likelihood of internal or external conflict. A community management program in Oregon that encompassed all of Oregon's fishing communities would be too large for adequate communication and representation from all interested parties. Also, major issues for North coast fishermen are likely to be very different than major concerns of Central coast or South coast fishermen. Similarly, fishermen in different fisheries and different gear sectors have different and sometimes competing interests. Geographical distinctions are also a concern. Different fish travel different distances, generally going beyond political boundaries. "Oregon's" fish don't just stay in Oregon, neither do Oregon's fishermen stay in Oregon's waters.

An approach like Alaska's Community Development Quota (CDQ) may be a good approach for dealing with all of this variability – quota is given to a community and the community decides what to do with that quota. Currently, Alaska's CDQ system applies to rather isolated populations of native residents. The CDQ program is still quite new, and the feasibility of applying it to a broader population, such as Oregon's commercial fishing industry, has not been examined. For example, state-wide cooperatives could be established for a specific gear type or a specific fishery and then divided geographically into more local organizations. The state-wide cooperative, with representatives from the local groups, could deal with issues that would impact all of the local groups, such as

whether there are geographical limits to each cooperative, and how to allocate quotas between cooperatives. Each local organization would receive a quota, and the local cooperative would decide how to allocate the quota among its members, how to monitor its members, and enforce the regulations.

6.3.4 How?

The first step to initiating a community management program is to convince the public, the fishing industry, and government fishery managers that community management would be a worthwhile approach to fishery management that would be mutually beneficial. Survey responses showed that commercial fishing is valued in coastal communities and a tradition that residents want to maintain. However, the public does not have a clear idea of how community management might occur.

As part of this process, the public, fishing industry, and government managers must learn to trust each other and work together cooperatively. We already know that there is mistrust between fishermen and fishery managers. Although the public, including fishermen, recognize the role of government in resource management, they are also likely to be wary of government agencies. I would also presume that government agencies are wary of the public's and fishing industry's ability to manage commercial fisheries.

Once people are able to work together, they must begin the process of determining the objectives of community management, establishing a legal basis for community management, establishing appropriate scales of management, implementing community regulations, establishing methods for conflict-resolution, and developing

monitoring and enforcement mechanisms. A large part of all of this will be to determine at what level various management functions are handled.

Ideally, local communities would develop and administer their own fishery regulations (consistent with conserving fish populations over their entire ranges), creating buy-in, and incorporating the broadest possible spectrum of values and knowledge. Many different kinds of institutional structures can be envisioned to achieve this goal. The problem become one of choosing a structure that creates incentives for stewardship and ecosystem protection (Fujita, Foran, and Zevos 1998: S147).

Obviously this is a very broad, general idea of the "how" of community management. It will be important throughout the process for people to be patient, not to lose sight of the goal, and for members to feel that their concerns are recognized and being incorporated into the management program. Similarly, members will need to recognize that competing interests will make it highly unlikely that everyone's needs are completely met.

6.4 Summary

Based on the current tradition of community-based management, political structure, and willingness of survey respondents, I think community management is practicable. However, it would not be simple, and a great deal of research and planning would be needed to lay a foundation that would make community management practical. The first step would be to generate support from the community, the fishing industry, and the government. The interested parties would then need to learn to trust each other and work cooperatively. There is a great deal of conflict in fishery management, between fishermen and fishery managers and within the fishing industry, but at least in Oregon these people are used to dealing with one another. Participants would need to identify the overall goals of a community management program, select the appropriate scale, and

determine how fishery management responsibilities would be shared between communities and the government. Once institutional arrangements are specified, individual communities can determine more specific management goals and the fine points of fishery management appropriate to their community.

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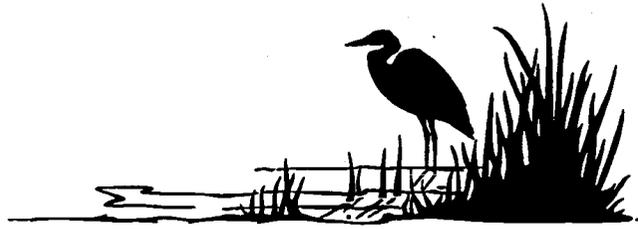
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APPENDIX A
SURVEY OF COASTAL RESIDENTS

This appendix is the mail survey sent to residents in Oregon coastal communities in the fall of 1997.

OREGON COASTAL RESIDENT'S VIEWS ON COMMUNITY ISSUES



As you are well aware, there are many changes taking place in Oregon coastal communities. However, relatively little is known about how individuals and families involved in these communities are adapting to such changes. By directly asking people their opinions, this project aims to develop a better understanding of communities on the Oregon Coast. This project is being conducted by Oregon State University researchers, with funding from a United States Department of Agriculture Grant. In the study we want to identify community programs, organizations, agencies, and policies that help people gain information and skills and identify ways in which those programs could be made more helpful. As a member of a coastal fishing community, your views about the role of commercial fishing are particularly important.

Your household has been randomly selected as part of our scientific sample of area residents to participate in this study. Every household in your community had an equal chance of being chosen for the sample. In order to give every adult in your house an equal chance to participate, **the adult in the household with the most recent birthday should fill out the survey.** If the results are to *accurately* represent the views of people in your area, by taking the time to complete the questionnaire, you will insure the result represent your community.

All responses will be treated with *complete confidentiality*. We will use information in a summary format that does not identify individuals. The questionnaire has an identification number for mailing purposes only. This is so we can check your name and address off the mailing list when your questionnaire is returned.

Information from this study will help local decision and policy makers consider the needs and preferences of your community. Furthermore, responses from people in your community may also be useful to other coastal communities around the country facing similar changes. You can receive a summary of results by writing your name and address on the return envelope. Please **do not** put your name on the questionnaire itself.

We know that your time is valuable, and we thank you very much for your willingness to help. If you have any questions, or if we can be of any assistance, please feel free to call us at 541-737-2641.

Respectfully,

Lori Cramer
Assistant Professor

Emily Hanson
Graduate Assistant

ID# _____
(For mailing purposes only)

DIRECTIONS & OVERVIEW

This survey contains separate sets of questions. In each section you will be asked a number of questions concerning each of these specific areas. Where indicated, please circle the appropriate number for your response. Additional comments can be written on the last page of the survey.

YOUR ANSWERS AND COMMENTS ARE STRICTLY CONFIDENTIAL

SECTION 1

In this first section we would like to ask you some general questions about your community.

Q-1 What do you like most about your community? _____

Q-2 What do you like least about your community? _____

Q-3 Using a scale that ranges from 1 (NOT AT ALL SATISFIED) to 5 (COMPLETELY SATISFIED), please circle the number that indicates how you would rate your community on each of the items listed below:

How would you rate your community?	Not at All Satisfied		Completely Satisfied		
a. As a place to raise a family	1	2	3	4	5
b. Availability of medical and health services	1	2	3	4	5
c. Quality of local schools	1	2	3	4	5
d. Opportunity to earn a liveable income	1	2	3	4	5
e. Overall effectiveness of local government	1	2	3	4	5
f. Availability of senior citizens' programs	1	2	3	4	5
g. Availability of youth programs	1	2	3	4	5
h. Local tax rates	1	2	3	4	5
i. Recreation facilities and programs	1	2	3	4	5
j. Friendliness of the people	1	2	3	4	5
k. Quality of the natural environment	1	2	3	4	5
l. As a place to shop	1	2	3	4	5
m. Availability of cultural events (e.g., theater, lectures)	1	2	3	4	5

Q-4 Using a scale of 1 (MORE DESIRABLE) to 5 (LESS DESIRABLE), please circle the number that best indicates your responses to the following:

More Desirable	Less Desirable
-------------------	-------------------

- | | | | | | |
|---|---|---|---|---|---|
| a. Would you say your community has become more or less desirable as a place to live in the <i>past</i> 5 years. | 1 | 2 | 3 | 4 | 5 |
| b. During the <i>next</i> 5 years or so, do you think your community will become more or less desirable as a place to live? | 1 | 2 | 3 | 4 | 5 |

Q-5 What percentage of your household income is spent in your community (e.g., on groceries, clothing, health care, leisure activities)? _____%

Q-6 Using a scale of 1 (NOT AT ALL IMPORTANT) to 5 (EXTREMELY IMPORTANT), please circle the number that best indicates how important you think each of the following items is for the future quality of life in your community.

Not At All Important	Extremely Important
-------------------------	------------------------

- | | | | | | |
|--|---|---|---|---|---|
| Importance for future quality of life: | | | | | |
| a. Preserving existing ways of life | 1 | 2 | 3 | 4 | 5 |
| b. Increasing economic opportunities for local residents | 1 | 2 | 3 | 4 | 5 |
| c. Improving community public services | 1 | 2 | 3 | 4 | 5 |
| d. Increasing the community's ability to influence state and federal decisions that affect local residents | 1 | 2 | 3 | 4 | 5 |
| e. Limiting population growth | 1 | 2 | 3 | 4 | 5 |
| f. Encouraging new recreation/tourist developments in the area | 1 | 2 | 3 | 4 | 5 |
| g. Maintaining the natural resource history of the area | 1 | 2 | 3 | 4 | 5 |
| h. Improving/increasing cultural activities | 1 | 2 | 3 | 4 | 5 |

Q-7 From the items a-h in the previous question (Q-6), please rank the top three items you think are most important for the future quality of life in your community. (Please write the letter in the spaces below.)

- _____ #1 most important
- _____ #2
- _____ #3

Q-8 Are you aware of any community programs to address the following? If yes, how did you hear about these programs? For each program, please circle all that apply:

How did you hear about the Program?
 1 = friend/family
 2 = newspaper
 3 = flyer or leaflet
 4 = radio/television

Aware of any Programs
 (Y=Yes, N=No) Program Name

a. School/youth activities	Y N		circle: 1 2 3 4 other: _____ circle: 1 2 3 4 other: _____
b. Job training opportunities for adults	Y N		circle: 1 2 3 4 other: _____ circle: 1 2 3 4 other: _____
c. Continuing education courses	Y N		circle: 1 2 3 4 other: _____ circle: 1 2 3 4 other: _____
d. Increasing the number of jobs available in the area	Y N		circle: 1 2 3 4 other: _____ circle: 1 2 3 4 other: _____

Q-9 Have you or a member of your family participated in any of the above community programs?

1 = YES ----> *If yes, please list programs* _____

2 = NO ----> *If no, why not?* _____

Q-10 Are you involved in any formal community organizations (e.g., church, PTA, Elks, Volunteer fire dept. Boy/Girl scout leader, adult sports teams, etc.)?

1 = YES ----> *If yes, please list* _____

2 = NO _____

Q-11 What type of *adult* education and job training/career development opportunities would you like in your community?

Q-12 What would you like from the community to help *children* reach their educational and career goals?

SECTION 2

In this second section, we are interested in the human resources existing in your community. We would like to know more about your job skills regardless of whether or not you are currently employed. *If you are retired or unemployed, please base your responses on your most recent job held.*

Q-13 Are you currently employed?

1 = YES ----> *If yes, what is your job/occupation?* _____

2 = NO ----> *If no, what was your job/occupation?* _____

a. Are (or were) you self-employed?

1 = YES ----> *If yes, how many people, in addition to yourself, do/did you employ?* _____

2 = NO

b. How long have you been (or were you) at this position? _____ YEARS

c. Describe the work you do (or did). Please indicate the specific skills that apply to your job.

d. Where did you learn these skills? _____

Q-14 How much formal education is required these days to get a job like yours?

1 = LESS THAN HIGH SCHOOL DIPLOMA

2 = HIGH SCHOOL DIPLOMA

3 = VOCATIONAL, TRADE OR BUSINESS SCHOOL

4 = SOME COLLEGE

5 = ASSOCIATES DEGREE

6 = BACHELOR'S DEGREE

7 = GRADUATE DEGREE OR OTHER PROFESSIONAL DEGREE

Q-15 On a job like yours, how long would it take the average new employee to become fully trained and qualified?

1 = LESS THAN 1 YEAR ON THE JOB

2 = 1-2 YEARS ON THE JOB

3 = 3 OR MORE YEARS ON THE JOB

Q-16 Have you participated in any job skills training away from your place of employment?

1 = YES ----> *If yes, what type and where?* _____

2 = NO _____

Q-17 Are you interested in obtaining additional job skills training?

1 = YES ----> *If yes, what type?* _____

2 = NO ----> *If no, why not?* _____

SECTION 3

In this section, we would like to learn about family issues that may be associated with educational opportunities for your children. *If you currently do not have children 18 or younger living in your home, please skip to section 4 on page 7.*

Q-18 How many children under the age of 18 do you have living at home? What are their ages?

a. Number of children _____

b. Ages of children _____

Q-19 Parents differ in how much they talk to their children about future plans. How often do you or your spouse/partner talk with your children about their educational plans after high school? (Please circle your response)

1 = NOT AT ALL

2 = 1-2 TIMES PER YEAR

3 = 3-5 TIMES PER YEAR

4 = MORE THAN 5 TIMES PER YEAR

5 = NOT APPLICABLE - CHILDREN TOO YOUNG

Q-20 Using a scale of 1 (NOT AT ALL SATISFIED) to 5 (COMPLETELY SATISFIED), overall, how satisfied are you with the public education your children have received up to now?

1
Not at All
Satisfied

2

3

4

5
Completely
Satisfied

Q-21 Where 1=YES and 2=NO, please circle the number that best indicates your responses to the following:

	YES	NO
a. Do you expect your children will go on to additional education beyond high school?	1	2
b. Do you have a computer in your home that your children use for educational purposes?	1	2
c. Have your children attended classes outside of their regular school (e.g., art, music, computer)? <i>Please list</i> _____	1	2
d. Are your children involved in any non-school activities (e.g., boy/girl scouts, 4-H, sports, church groups)? <i>Please list</i> _____	1	2

SECTION 4

Commercial fishing has played a dominant role in the economics, culture, and history of many coastal communities. In this section we would like to learn about the role of commercial fishing in your community and about the role of the community in commercial fishery management.

Q-22 What percentage of people in your community do you believe are employed in the commercial fishing industry? _____%

Q-23 Do you see the percentage of people in the commercial fishing industry increasing or decreasing in the future? (Circle the number that describes your response.)

- 1 = INCREASING GREATLY
- 2 = INCREASING SOMEWHAT
- 3 = NO CHANGE
- 4 = DECREASING SOMEWHAT
- 5 = DECREASING GREATLY

----> *Why?* _____

Q-24 The following questions are about the importance of commercial fishing in your community. Using a scale of 1 (NOT AT ALL IMPORTANT) to 5 (EXTREMELY IMPORTANT), please circle the number that best indicates your answer.

	Not at All Important				Extremely Important
a. How important do you think commercial fishing <i>has been</i> in the historical development of your community?	1	2	3	4	5
b. How important do you think commercial fishing is in your community <i>right now</i> ?	1	2	3	4	5
c. How important do you think commercial fishing <i>will be</i> in the future of your community?	1	2	3	4	5

Q-25 Do you think that your community should maintain its commercial fishing heritage?

1 = YES ----> *If yes, how?* _____

2 = NO ----> *If no, why not?* _____

Q-26 Are you familiar with current fishery management activities that affect your area?

1 = YES

2 = NO

Q-27 How frequently have you (or someone in your household) participated in the fishery management process in the past (e.g., attended Pacific Fishery Management Council meetings)?

1 = NEVER

2 = 1-2 TIMES PER YEAR

3 = 3-5 TIMES PER YEAR

4 = MORE THAN 5 TIMES PER YEAR

Q-28 In your opinion, what would be a realistic role for the general public in fisheries management? (Please circle all answers that apply to your opinion.)

1 = None, let resource professionals (e.g., Department of Fish & Wildlife) decide.

2 = Provide suggestions and let the resource professionals decide.

3 = Serve on advisory boards that review and comment on decisions.

4 = Act as a full and equal partner in making management decisions.

5 = The public should decide management issues and resource professionals should carry them out.

6 = Other: _____

b. From the following list, please rank the *top three* ways the community could raise revenues to support community-level fishery management? (Place a 1 in front of your first choice, a 2 for your second choice, and a 3 for your third choice.)

___ property taxes ___ user fees ___ bonds
___ local taxes ___ donations ___ state or federal grants
___ local sales tax ___ other (please list) _____

c. How much time would you be willing to volunteer to support community-level fishery management?

1 = none
2 = 1 hour per month
3 = half day per month
4 = 1 day per month
5 = more than 1 day per month
6 = other (please specify) _____

d. How much would you be willing to pay to support community-level fishery management?

1 = none 4 = \$10/month
2 = \$1/month 5 = \$20/month
3 = \$5/month 6 = more than \$20/month
7 = other (please specify) _____

SECTION 5

To best evaluate our survey results, we need some information about your background. Remember that all responses will be **CONFIDENTIAL**.

Q-31 Please tell us your sex:

1 = MALE
2 = FEMALE

Q-32 What is your year of birth? _____

Q-33 What is your current marital status?

1 = MARRIED 4 = WIDOWED
2 = SINGLE (NEVER MARRIED) 5 = SEPARATED
3 = DIVORCED 6 = LIVING WITH PARTNER (UNMARRIED)

Q-34 What ethnicity do you consider yourself to be?

1 = WHITE 4 = NATIVE AMERICAN
2 = AFRICAN AMERICAN 5 = ASIAN OR PACIFIC ISLANDER
3 = MEXICAN AMERICAN 6 = OTHER (Please specify) _____

Q-35 What is the highest level of education you have completed?
1 = LESS THAN HIGH SCHOOL DIPLOMA
2 = HIGH SCHOOL DIPLOMA OR GED EQUIVALENT
3 = VOCATIONAL, TRADE OR BUSINESS SCHOOL
4 = SOME COLLEGE
5 = ASSOCIATES DEGREE
6 = BACHELOR'S DEGREE
7 = GRADUATE DEGREE OR OTHER PROFESSIONAL DEGREE

Q-36 What is your length of residence in this community? _____ YEARS

Q-37 Which of the following best describes your residency?
1 = YEAR-AROUND RESIDENT
2 = SEASONAL RESIDENT ----> (How many months per year? _____ MONTHS)

Q-38 Do you have any plans to move away from this area in the next five years?
1 = YES
2 = NO ----> Why/why not? _____

Q-39 Which of the following categories would best describe your total household income, before taxes, in 1996? (Please circle the appropriate number)

1. Less than \$5000	5. \$20,000-24,999	9. \$40,000-44,999
2. \$5000-9,999	6. \$25,000-29,999	10. \$45,000-49,999
3. \$10,000-14,999	7. \$30,000-34,999	11. \$50,000-74,999
4. \$15,000-19,999	8. \$35,000-39,999	12. \$75,000 or higher

Q-40 Please indicate any additional comments you may have:

We appreciate your taking the time to fill out this survey. Please fold your questionnaire and place it in the enclosed, self-addressed, stamped envelope. If you have any additional questions, please feel free to contact Dr. Lori Cramer at 541-737-2641.

APPENDIX B
REGIONAL ECONOMIC PROFILE SUMMARIES

This appendix contains information summarized from Oregon Employment Departments Regional Economic Profiles for 1998 for Region 1 (Clatsop, Columbia, and Tillamook Counties), 4 (Benton, Lincoln, and Linn Counties), 5 (Lane County), and 7 (Coos and Curry Counties). The information summarized focuses specifically on changes in the natural resource-dependent industries, especially fisheries.

Region 1: Clatsop, Columbia, and Tillamook Counties (Oregon Employment Department. 1997. *1998 Regional Economic Profile: Region 1*. By Alan Stoebig. State of Oregon Employment Department.)

Lumber and wood products are the major manufacturing industries in these three counties, with agriculture (cattle) playing a major role in Tillamook County. Tourism and services to retirees are the primary growth activities, with older age groups comprising a significant percentage of the region's population base, especially in coastal counties (20.9% of Tillamook county and 16.5% of Clatsop county was over 65 years old in 1990), relative to 13.8% in all of Oregon. Occupations associated with the forestry and fishing industries have been losing ground over the past decade, while occupations that are concentrated in the trade and service industries have registered the largest growth rates. It is projected that future population growth will depend somewhat on the stability of timber and fishing related industries, but also on the growth of trade and services that could attract additional retirees.

Although growth is expected in the agriculture, forestry, and fishing sector between 1996 and 2006, it is the third slowest growing sector in the region (growing at 15.7% versus the fastest growing sectors in service occupations and sales-related occupations, which are growing at more than 20%). Lumber and wood product employment has declined, from providing 2,330 jobs in 1986 to 1,830 jobs in 1996. Historically, salmon, shrimp, and crab have been the most important commercial fish catches, but groundfish are now comprising an increasing portion of the total catch. Tillamook Bay is also a major source for oysters. Although in decline since 1980, seafood processing still plays a significant role in the economy, especially in Astoria and other communities located at the mouth of the Columbia River. Processors and

fishermen have attempted to diversify, from relying solely on salmon, shrimp, and crab to including whiting and groundfish. However, whiting and groundfish are also threatened by overfishing and lower quotas have been adopted.

Region 4: Benton, Linn, and Lincoln Counties (Oregon Employment Department. 1997. *1998 Regional Economic Profile: Region 4*. By Earl Fairbanks. State of Oregon Employment Department.)

Lumber production, fishing, and tourism are the major industries in Lincoln County. The county's economic structure is biased toward resource-based industries, industries that are undergoing changes that could limit future employment opportunities. The fastest growing occupations in this region are in service, sales, and professional and technical occupations, with the slowest growth rates occurring in agriculture, forestry, and fishing, and clerical and administrative support occupations. Four out of ten Lincoln county jobs are in tourism-related industries, and the region is actively involved in trying to attract visitors. The region, especially Benton County, is also seeing significant growth in the high tech industries.

The estimated value of commercial fish and shellfish landings in Newport in 1994 was over \$19 million. The top three species landed, by value, were Dungeness crab (\$4.6 million), Pacific whiting (\$3 million), and Albacore tuna (\$2.1 million). Conversion of primary fishing goods to value added products is also important for the regional economy. In 1996, 1,470 people were employed on average, with 1,800 people working at local food processors during the peak season (summer) in 1997. In Lincoln County fish processing accounts for the bulk of food processing employment. Total payroll in Lincoln County in Agriculture, Forestry, and Fishing was \$11.9 million in 1997, with an

average personal income of \$33,616. In the fishing industry, average personal income was \$40,151. Average personal income in Lincoln County for all occupations was \$20,566, due to large number of retail and service related jobs. Approximately one-half of Lincoln County jobs are in trade and service, with average payroll for these jobs of \$13,337 and \$15,846, respectively, per year.

Region 5: Lane County (Oregon Employment Department. 1997. *1998 Regional Economic Profile: Region 5*. By Brad Angle. State of Oregon Employment Department.

Originally Lane County's economy was supported by timber and agriculture, but it has diversified into financial, education, and government sectors. The County also has an active tourism industry and is growing as a place of high-tech work. As with the other regions, there is a population shift toward older age groups and the businesses associated with providing services for retirees. Health services, business/professional services, and social services have dominated employment changes, with significant increases in the trade sector as well. Total spending by visitors in Lane County in 1995 was estimated to be \$321.4 million, with an associated employment of 5,500 people.

For decades, the lumber and wood products industry was the largest industry in Lane County, but employment in the industry has declined sharply because of reductions of timber harvests off federal lands. Since 1989, total production has declined 36% (through 1995) and total employment 36% (through 1996). However, the wood products industry is still the largest components of the manufacturing industries, accounting for approximately 40% of total manufacturing employment in Lane County. Commercial fishing, although small, is important to the coastal economy. Fishing has been hit hard by declines in fish populations and endangered species considerations. The total value of

harvests has dropped as the catch has switched to lower-value species, hurting overall income generated and jobs and personal income. Approximately 2% of Lane County's employment is in agriculture, forestry, and fishing, and it is only projected to add 509 jobs between 1996 and 2006, versus growth in the thousands for professional/technical, service, sales, clerical/administrative, and production/construction/maintenance occupations.

Region 7: Coos and Curry Counties (Oregon Employment Department. 1997. *1998 Regional Economic Profile: Region 7*. By John Anderson. State of Oregon Employment Department.

Agriculture, forestry, and fishing are important industries in this South Coast region of Oregon, but is also the only major occupational category to lose employment. Non-manufacturing employment has increased by about 30% in the past ten years, with a net gain of 5,300 jobs, with trade and services accounting for 61% this job growth. Conversely, manufacturing employment has decreased by approx. 45%, with the majority of this decline in the lumber and wood products industries, with over 2,100 jobs lost since 1987. Region 7 employment is expected to increase by 11.4% between 1996 and 2006, with 75% of the projected growth expected to be in the professional and technical, sales, and service industries. The portion of the population over 75 years old has increased significantly in Coos and Curry counties, up by 10% and 13%, respectively. There has also been a large increase in people in the 45-54 age group.

Fishing is still an important industry, although many changes have occurred recently. Salmon used to be a major share of the total landings by weight and value, but has been adversely impacted by climactic changes, increased regulation to protect the

species, overfishing, and competition from other fisheries, including farmed salmon. Between 1989 and 1994, salmon landed in South Coast ports declined from 3 million pounds to 80,000 pounds. In 1995 and 1996, salmon catch totaled 360,000 pounds and 480,000 pounds, respectively. Eighteen million pounds of groundfish were landed here in 1996, accounting for approximately half of the region's total catches, but annual groundfish catches have declined by about 10 million pounds since 1990. The urchin harvest has also declined substantially, from 8 million pounds in 1990, to less than 1 million pounds in 1996. These declines have been somewhat counteracted by large increases in crab and shrimp landings. The total value of fish and shellfish landings was \$25.7 million, up 12.4% (\$2.9 million) from 1995. Landings in Coos and Curry Counties accounted for approximately 31% of the total value of fish and shellfish landed in Oregon in 1997.

APPENDIX C
SUPPLEMENTARY BIBLIOGRAPHY

This appendix includes literature reviewed but not specifically cited in the text. The information is organized into the following subheadings: theoretical background of common property management; case studies; roles and participation; fisheries and resource management; implementation; economics; and surveys. References specifically cited in the text are included in the "Sources Cited" and are not listed here.

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