This is an investigative, descriptive study that explored fishing regulation conflicts between commercial fishermen and fishery resource management agencies. The purpose of the study was to develop a rich picture of the conflict phenomenon and apply sociological theory in order to illuminate the underlying structures and functions which contribute to the conflict.

Ethnographic methods and guided conversations were used to collect data. The themes which emerged centered around issues of inequity, inadequate representation, poor communication, politics and bureaucracy. It was found that the bureaucratic structure of the regulatory decision making process unevenly distributes power and control. It is suggested that processes and management approaches which involve all of the stakeholders in a decision making system which is not hierarchical in structure may help alleviate some of the conflict between commercial fishermen and fishery resource management agencies.
A Sociological Analysis of Fishing Regulation Conflicts:
An Ethnographic Study

by

Jennifer A. Dwyer

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Jennifer A. Dwyer, Author
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This thesis is dedicated to
my family with love;
Dr. John Dwyer, Joyce Dwyer,
Andy and Alison.
A Sociological Analysis of Fishing Regulation Conflicts:
An Ethnographic Study

Introduction

Natural resource industries have become embroiled in recent years. Many natural resources have reached a crisis situation due to past practices, current demands, technological innovations and an expanding knowledge base regarding the resources and the ecological systems in which they are embedded. Due to technological, social and environmental changes, natural resource industries have gone through a dramatic transformation. The Oregon commercial fishing industry is one example of a natural resource industry which has experienced such changes. Prior to 1960, the Oregon fishing industry experienced rapid growth as a result of the adoption of advanced technologies, expanding markets and unrestricted, open-access fishing opportunities (Radtke & Jensen 1990:2). The Oregon fleet was characterized by many small, family run businesses; and fisheries management was essentially self-regulatory during this period of open-access with management strategies based on local conditions or practices developed over time. The historical focus of fishing activity was to utilize technology to maximize harvest levels and profits (Smith & Jepson 1993:40). The fishing industry not only developed local management regimes but a culture unique to these occupational communities.

The Oregon fishing industry began to change in the 1960's. The precipitating events leading up to the change in the commercial fishing industry include: decreasing fish stocks resulting from environmental changes (el Nino, loss of habitat, low ocean productivity etc.), over-fishing and advances in fisheries science including models of:
stock productivity, yield per recruit and maximum sustainable yield. These circumstances lead to an increase in management policies at all levels of government. The management policies which were set in place during the 1960's and 1970's marked a departure from an industrial approach, which stressed maximum resource extraction, to a biological approach, stressing sustainable resource use and ecological functions (Smith & Jepson 1993:40). This shift in the management paradigm had a direct impact on the commercial fishing industry because the industry was now being directed when to fish, what to fish for, how to fish and who could participate in the fisheries.

In the 1960's, state, federal and international management regulations were implemented by an increasing number of agencies and regulatory committees. The rise in the number of regulations is associated with an increase in bureaucracy and politics regarding commercial fishing activity. Today, the fishermen operating in commercial fisheries have to adapt to the increasing complexity of fisheries resource management policies and regulations affecting access to fishery resources, or leave the industry. The ability to abide by the fishing regulations is one of the main determinants of one's ability to sustain fishing activity, "This [fishing] used to be a nice occupation. Now you have to have a Ph.D. in law to do it" (McIntyre 1995:90). The regulations accompanying management plans and policies set restrictions on the level of fishing effort through limited entry provisions, the level of harvest through quotas and seasons and the composition of harvests through gear restrictions and catch requirements such as size and sex. These regulations have made it more difficult to participate and have profitable operations for fishermen, especially those who are owner-operators running a small business. Thus, the commercial fishing industry has changed from being comprised of many, small, family businesses to fewer, larger
businesses which are often owned by corporations. Marine fisheries regulations were identified by 99% of respondents as harming their ability to make a living from commercial fishing (Smith 1995:25). Although economic concerns are a key issue to fishermen, a compounding issue that has developed as a result of the rise and dynamic nature of fisheries regulations, is an increase in conflict between fishermen and management agencies.

In the face of declining fish stocks and profits, management policies have become the topic of controversies. Proposed management policies are either seen as benefiting the fishing industry (i.e., when allocations are large) or as benefiting nonindustry interests (i.e., when allocations are limited or shut down). Management policies have a direct impact on the allocation of scarce resources and thus are fundamentally political in nature (Golden 1996). Commercial fishermen and fisheries resource managers are pitted against each other as regulations are proposed and imposed in the regulatory decision making process. It has been proposed that the components contributing to fishermen-management conflicts include (but are not limited to): the state of the science and technology upon which management decisions are based, values and the priorities assigned to those values and beliefs (Peyton 1987).

This investigation explores the conflict between commercial fishermen and fishery resource management agencies over fishing regulations. The conflict is found in a complex web of material conditions, interactions and relationships and, like many natural resource conflicts, is inherently complex and involves many different stakeholders (Walker and Daniels 1996). The complexity of the conflict calls for a comprehensive approach to gaining understanding. To provide an understanding of the perspectives and methods used in this investigation, a brief review of the
philosophical, theoretical and methodological approaches used in sociological investigations will be presented. The philosophical, theoretical and methodological approaches which were utilized in this investigation will be described in depth. The findings of this study will be shared and then analyzed by viewing them through a lens of sociological theories. In the conclusion of this paper, the sociological interpretations of the fishing regulation conflicts will be discussed with regards to the implications the findings have on future fishery management approaches.
Philosophical & Theoretical Frameworks

Philosophies of science provide researchers with a framework to approach scientific investigations. The philosophy(ies) subscribed to functions as part of a paradigm and provides a context from which theories can arise. Because theories are essential to the structuring of scientific investigations, it is important to identify the philosophical orientations associated with the theoretical framework(s) guiding an investigation. The importance of philosophical perspectives lies in the assumptions these paradigms hold about the world. Philosophies of science reveal the assumptions held on reality, objectivity, truth and knowledge. The metaphysical assumptions one holds about the world, influence not only how scientific investigations are approached, but how they are designed and how findings are interpreted. Although there are a number of philosophies of science, this discussion will be limited to two distinct paradigms (representing the "two ends of the spectrum"). A brief overview of mechanism and contextualism is presented, followed by the philosophical orientation of this study.

Mechanism

A mechanistic, Newtonian world view asserts that reality is independent and that we have direct access to the world through observation (Pepper 1970). Viewing reality as independent separates the observer from the observed. This neutral, objective, independent view means that what we see is what we get. The central thesis of the mechanistic perspective is that there is an independent reality which we can directly access through observation due to our objective position as the observer.
Because we have direct access to the world through observation, observation becomes the measure of truth. The validity of knowledge resides in observation, thus observation is the final arbiter and determines what is true. The correspondence theory of truth states that a hypothesis is evaluated on the basis of its correspondence with observation.

**Contextualism**

A contextualist, Kantian perspective states that we can not know the independent reality because there is a filter or lens which transforms the independent reality into the dependent reality, which is the world as we experience it (Pepper 1970). Contextualists argue that we can not achieve absolute objectivity because this perspective is grounded in the assumption that we do not have direct access to reality. This differs from the mechanistic perspective because it says that we are not objective, neutral observers; rather we observe the world through a lens which transforms, filters and interprets the independent reality into a dependent reality which is what we "think we see."

The lens with which we view the world is constant and can never be removed because it is part of our humanness. The lens is composed of: world views, experiences, historical events, values, beliefs, ideologies, culture as well as genetic and physiological attributes. The lens operates relatively similarly for all humans, but more so for those sharing common cultures, beliefs and values. Thus, as more attributes of the lens are shared, there will be an increasing level of common understanding regarding the world. The lens is composed of social and physical/environmental attributes, thus, it is dynamic and changes through time and space.
Research Orientation

The philosophy of science that best characterizes this research is the contextualist perspective. This perspective says that we are not objective observers because we are intimately involved in the phenomenon we are observing. In order to understand the phenomenon, we interpret and give it meaning by identifying its relationships to other aspects of our world of experience.

The contextualist perspective suggests that we can not achieve absolute objectivity in science. To be truly objective in science an individual must not let their beliefs, values, goals, world views, experiences, ideologies or culture influence their observations, experimental design or analysis in a scientific investigation (Pepper 1970). The contextualist perspective purports that these aspects of science are embedded in who we are to such a degree that we can not isolate them and remove them from our investigations. These aspects form a lens through which one views the world; thus, the lens determines how we interpret our world of experience. The goals, ideologies and values forming one's lens are acquired through our experiences in life or through our socialization. The lens which we develop is tied to our identity and harbors our fundamental assumptions about the world and how it functions.

This investigation comes from a contextualist perspective which argues that a phenomenon cannot be isolated when studied. This philosophical framework contends that the narrow scope of a hypothesis may produce evidence which supports it's prediction not because the isolated variable(s) are producing a given result, but because of other factors at work (i.e., other variables which were not identified as the independent variable(s) in the study). Commercial fishing regulation conflicts are complex and unwieldy. Using a contextualist perspective, this study does not
attempt to take into account all of the factors associated with the conflict between commercial fishermen and fishery resource management agencies; rather, it focuses or raises in relief the issues surrounding fishing regulations and the regulatory decision making process from the rest of the factors associated with the commercial fishing industry or shell of contingencies.

Theoretical frameworks come from the philosophical perspectives and are detailed for the discipline of concern, adding additional structure to the investigation. Sociology has several levels of theory: 1) broad theories or schools of thought and 2) theories which are specific to a particular sociological phenomenon (i.e., social change), which are usually associated with a particular theorist(s). Different philosophies are associated with different theoretical frameworks. These frameworks are subsequently associated with particular sociological theories. In turn, these theories are associated (in general) with particular types of research, which are aligned with various types of methodologies. The following section is a brief review of the five broad theoretical perspectives in sociology (positivist, interpretive, critical, feminist and post-modernist), and the more specific theories embedded in these schools of thought. This review is based on the texts by Neuman (1994), Sedlack & Stanley (1992) and Farganis (1996). The review of the broad theoretical approaches will serve the purpose of outlining what perspectives are available for viewing commercial fishing regulations sociologically.

**Positivist**

The positivist theoretical approach is embedded in the mechanistic paradigm. Positivism is also found under the names logical empiricism, conventional science, naturalism and behaviorism. The purpose of scientific investigations within
this framework is to uncover major factors or universal laws which will have the utility of predicting general patterns of human activity. The positivist approach is therefore nomothetic. The process of positivist research is deductive thus, precise, quantitative empirical observations are used to test hypotheses in order to establish universal, causal laws. Truth is determined by the correspondence theory of truth as it is in mechanism. Under the positivist framework, research is considered to be objective and value free which resonates with a mechanistic world view. Sociologists associated with the positivist school of thought include: Comte, Durkheim and Spencer (Farganis 1996). Positivism gave rise to functionalism with the work of Merton, Parsons, Davis and Moore, behaviorism which Homan’s work is a cornerstone, and exchange theory with social theorist Blau.

**Interpretive**

The interpretive theoretical approach is embedded in the contextualist paradigm, and is sometimes called idealist theory. The purpose of research under this framework is to account for all of the factors involved in a specific phenomenon. Interpretive research provides a symbolic representation or a "thick description" of a phenomenon thus, it is ideographic. Coming from a contextualist paradigm it is not surprising that interpretive theory argues that research is not value free. The interpretive school of thought uses an inductive, qualitative approach to scientific investigation and is associated with the works of Weber. It is assumed that human behavior is not a consequence of universal laws; rather, patterns of behavior are created out of evolving socially meaningful interactions (Neuman 1994:62). Other theoretical perspectives are found in this interpretive school of thought, for example, the works of Simmel, Mead, Blumer and Goffman are the foundations of
symbolic interactionism. Durkheim, Weber and Marx founded ethnomethodology which gave rise to phenomenological theory and the works of Berger and Luckmann (Farganis 1996).

Critical

Critical theory mixes nomothetic and ideographic purposes and has roots in both mechanism and contextualism. Critical theory is also referred to as dialectical theory, materialism, structuralism, or realism. The critical approach to scientific inquiry is to go deeper than the surface illusions of the empirical world and uncover the real structures or unobservable mechanisms which cause the phenomenon in order to instigate social change (Neuman 1994:64). Critical theory is action oriented and does not view scientific investigations as value free since its' purpose is to promote social change to better the world, and this agenda is inherently value laden. The critical school of thought comes from the works of Adorno, Horkheimer, Marcuse, Pollock and Dubois (Farganis 1996). Marxist theory is found within this broad perspective and gave rise to the works of Dahrendorf and Mills.

Feminist

Feminist theory was influenced by Marx, Engels and Freud and was a reaction to functionalism. Similar to critical theory, the purpose of feminist theory is to uncover the underlying structures of the phenomenon. Using a feminist perspective, the gender and power based structures inherent in the web of human interactions are exposed in order to instigate social change. This action oriented research perspective
is embedded in a contextualist paradigm as it draws from socialization theory, as well as the works of Weber, Simmel and Durkheim (Farganis 1996).

Post-Modernism

The post-modernist theoretical framework rejects all social theory and argues causality can not be studied in a social world due to its' complexity and dynamic nature. Post modernist theory asserts that there are infinite interpretations of the social world and what really matters is the "here and now" (Neuman 1994:73). Post modernists include: Nietzsche, Derrida, Foucault and Lyotard (Farganis 1996).

Theoretical Framework for this Investigation

The contextualist paradigm framing this investigation is congruent with the assumptions held by the two theoretical approaches wedded in this investigation: interpretive and critical theory. Interpretive theory seeks to reveal the embedded meaning of a social phenomenon through systematic analysis of qualitative data. This study seeks to increase understanding of the conflict between commercial fishermen and regulatory, fishery management agencies. A particular issue is the role that communication plays in this relationship. There has been research on the conflict between commercial fishermen and management agencies, fishing communities and culture and business strategies of the fishing industry (Ellis 1984; Jentoft & Sanderson 1995; Smith & Hanna 1993; Smith 1995; Weeks 1995), however, current published material on this specific topic in the Pacific Northwest is scant. Due to the exploratory nature of this investigation an ideographic approach is an appropriate starting point.
This investigation goes beyond presenting a rich description of the phenomenon as it seeks to uncover underlying mechanism(s) and structure(s). In order to expand the sociological analysis of this investigation, critical theory is melded with interpretive theory. Building on the works of Weber and Marx, conflict theory provides a framework in which to understand social interaction, structure and function.

Conflict results from the continual struggle between social strata. In this study, fishery resource managers exercise their power over the scarce resources by operating in the politically powerful fisheries management organizations. The fishermen compete for power in the management organizations through lobbying, public commenting, letter writing and working as advisors on councils and committees. The regulations management agencies produce and enforce are inevitably in conflict with commercial fishermen, as they compete for power and control over an increasingly scarce resource.

Jones et. al. (1994:163-4) identified four propositions associated with conflict theory which were used to illustrate the conflict between management agencies and constituencies and explain the emergence of ecosystem management. These four propositions are based on the work of conflict theorists including: Coser (1956), Janus (1972) and Freeman (1992), and are:

1) Conflicts involving participants who feel they are representing the collective or group, fighting for the ideals of the group, are more likely to intensify conflict than those who are fighting for personal reasons. These ideological alignments limit an organization's ability to adapt to change.

2) Strict ideological alignments are more likely to occur in rigid organizations than in flexible adjustive ones, resulting in the rejection of the values and goals of the other parties involved in the conflict.
3) Social conflict involves the promotion of some values while other values are undercut due to difficulty in fulfilling them under altered social, cultural and political conditions.

4) Social conflict is the struggle over values and claims to scarce status, power and resources in which the aims of the opponents are to neutralize, injure or eliminate their rivals.

Natural Resource conflicts associated with fisheries are unique due to the culture of commercial fishermen. Commercial fishermen are a diverse group of individuals and therefore do not tend to function as a cohesive group (Smith & Hanna 1993:301). Therefore, in this study, the term "group" or "collective" identified in the first two propositions above, is broadened to include individuals who act as independent stakeholders. The fact that the population of commercial fishermen is diverse, and each person often operates as a private business, demands that this group of stakeholders be treated both collectively and independently depending on the regulation proposed, fishery or other particular conflict situation.

Other assumptions defined by the author of this study are based on the premise that commercial fishers are not a homogeneous group (Smith & Hanna 1993; Palmer & Sinclair 1996; Davis & Bailey 1996), and include:

1) Commercial fishermen will differ in their access to information.

2) Commercial fishermen will differ in their access to the decision making process of fishery management regulations and plans.

3) Commercial fishermen will not perceive the same levels of benefit from increasing their level of knowledge on fishing regulations.

4) Commercial fishermen will not share the same perceived and real costs of investing in increasing their level of knowledge on fishing regulations.

5) Commercial fishermen will value different sources of information differently.

6) Commercial fishermen will view the decision making process regarding fishing regulations differently.
These differences are important to recognize when investigating the conflict over fishing regulations and the decision making process because they warn against generalizing findings to the entire population.

The theoretical framework used here is a combination of interpretive and critical (specifically conflict) theories. This combination is derived from the topic (fishing regulation conflicts) and type of investigation (exploratory) being conducted. The topic of conflict between commercial fishermen and management agencies is similar to other natural resource conflicts where there are stakeholders in competition with each other over a scarce resource (Walker & Daniels 1996; Perusse Daigle, et. al. 1996). From the conflict theoretical perspective, Weber’s theories on bureaucracy and rationalization and Marxist theory on power and control will provide suitable frameworks for analyzing this type of social phenomenon. Interpretive theory is also an appropriate framework since the study is exploratory and uses grounded theory to link the empirical world to a larger sociological perspective (Figure 1).

Figure 1.

**Theoretical Approach**

| Empirical Data --> Interpretive Theory --> Grounded Theory --> Connect to established Conflict Theory |
Combining interpretive theory with conflict theory offers a perspective on understanding the ways in which fishermen and fishery management agencies create and maintain their social world. This theoretical synthesis is also useful for understanding the power and control over a resource which is in demand, yet not necessarily available.

Having identified the philosophical and theoretical frameworks and the operating assumptions of this investigation, the types, purposes and methods which are used in sociological research will be reviewed, followed by the types, purposes and methods which framed this study of fishing regulation conflicts.
Types & Purpose of Studies

There are many ways one can approach social research. The methodology chosen for any given social research investigation is ultimately dependent on external factors such as costs and time, the type or purpose of the research, (i.e., exploratory, explanatory, assessment) and the philosophical assumptions of the researcher. With the philosophical and theoretical perspectives identified and the research topic determined, the next step is to design the study (Neuman 1994). The study design answers several questions including: what type of research is being conducted?, what is the nature of the research (basic or applied)?, what is the temporal scale of the research?, what reasoning approach is implemented (inductive or deductive)? and what type of data will be gathered (quantitative or qualitative)?.

Types of Research

There are three general categories of social research. Each type has strengths and weaknesses and therefore have varying applicability for particular research needs or purposes. Table 2 reviews the general categories of research types and the purpose of those types (Neuman 1994:19-20).
Table 2

Types of Social Research

<table>
<thead>
<tr>
<th>Type</th>
<th>Function</th>
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<tr>
<td>Exploratory Research</td>
<td>To become familiar with basic facts, people and concerns. Develop a well grounded mental picture of the phenomenon. Determine the feasibility, questions and techniques for future research.</td>
</tr>
<tr>
<td>Descriptive Research</td>
<td>Provide an accurate profile of the people or phenomenon. Generate a verbal or numerical picture. Create categories or classify types.</td>
</tr>
<tr>
<td>Explanatory Research</td>
<td>Determine the accuracy of a principle or theory. Determine which of the competing explanations is better. Advance scientific knowledge. Build elaborate or extend a theory. Provide evidence to support or refute explanation.</td>
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Other studies have investigated the information exchange systems, politics, power and conflict in resource management (Smith & Jepson 1993; Jones, Martin & Bartlett 1994; Peyton 1987; Gale 1991; Smith & Hanna 1993; Smith 1995; Stephenson 1981; Mrakkovcich 1994). This study will focus on the fishing regulation information systems as an important component of the social and political processes associated with fisheries management policies and regulations. Due to minimal documentation on this topic, the investigation was designed to be exploratory. The exploratory framework fits with a contextualist paradigm and the interpretive and conflict theoretical frameworks since its' purpose is to develop a rich picture and understanding of the phenomenon. The purpose of this research is to apply a
sociological a lens which brings into focus part of the commercial fishing industry in Oregon and give it meaning by establishing relationships between different elements of the system. Contextualism argues that an entire systems (i.e., biological or social) needs to be taken into account during an analysis. However, the inherent complexity and size of the system which fishing regulations are embedded, makes analyzing the system as a whole difficult. Therefore, this analysis focuses on one aspect of modern commercial fisheries in Oregon, fishing regulation conflicts. By raising in relief the regulatory interface between fishermen and fishery management agencies from the rest of the system, social theories can more readily be applied to reveal the underlying structures and functions operating, thus gaining a better understanding of the phenomenon.

Basic and Applied Research

Social science can be executed in two distinct ways. There are basic social scientific investigations and applied social research projects. All types of research (exploratory, explanatory and descriptive) can be conducted in either an applied or basic manner. The essential difference between the two approaches is that basic research is done to advance fundamental knowledge about the social world and applied research is done to solve problems, make recommendations or to help accomplish tasks.

This research project does not fall neatly into one camp. The essence of this project from the interpretive theoretical framework is a basic research project since it is designed with the intention of increasing understanding of the phenomenon and providing a thick description of this social reality. This research project has applied characteristics as well which come from the conflict theoretical framework.
The investigation is designed to uncover the underlying structural mechanisms which contribute to the phenomenon and to make recommendations which would decrease the level of conflict and increase the level of cooperation between these two social groups.

Temporal Scale

Another dimension which guides a social science investigation is the time span which the study will cover. The study may take a snap shot of a social phenomenon or it may take a long term approach. Both cross-sectional research and longitudinal research can be used in exploratory, descriptive or explanatory approaches.

This study is a case study, which is a cross sectional approach. Other studies have employed a case study approach (Weeks 1995; Breton, et. al. 1996; Jentoft & Sandersen 1996). Logistical constraints (travel, informants' schedules etc.) often limited encounters to a single event with each informant. Data was collected between January 1996 and March 1997.

Inductive and Deductive Reasoning

The reasoning process which is used in an investigation is determined by the purpose of the project as well as the researcher's philosophical and theoretical orientations. Inductive and deductive reasoning are two conceptual approaches which can be used in an investigation. The reasoning process which is used directs whether the researcher begins the investigation at a broad, theoretical scale or a detailed, empirical scale. "In a deductive approach, you begin with an abstract, logical
relationship among concepts, then move toward concrete empirical evidence... If you use an inductive approach, you begin with detailed observations of the world and move toward more abstract generalizations and ideas” (Neuman 1994:41).

An inductive approach to research begins at the empirical level and lends itself to exploratory investigations which use interpretive theory. Using this approach, the researcher makes observations on the social phenomenon and then develops generalizations based on these observations. Grounded theory comes directly from the empirical world via these generalizations. Theories in related topic areas are connected with the grounded theory generated from the empirical world. Grounded theory is thus a conduit between the empirical observations and the topical theories which are found in larger theoretical frameworks (i.e., conflict theory, structural functionalism, exchange theory and symbolic interactionism). In this approach, the empirical observations are linked to the theoretical frameworks via generalizations and grounded theory.

A deductive approach begins with a broad theoretical framework and therefore is amenable to testing established theory (i.e., critical theory, feminist theory etc.). From the theoretical framework a topical theory is identified. The theory is further defined to a specific middle range theory and finally a hypothesis is proposed. The researcher then tests the hypothesis against the empirical social reality. Thus, a deductive approach to research begins with a high level of abstraction and moves through lesser degrees of abstraction until a hypothesis is tested against the empirical world.

There are limitations to both inductive and deductive approaches. The deductive approach to generating empirical hypotheses limits the formulation of the hypothesis to existing theoretical conditions; while the inductive approach to
generating hypotheses is limited by the set of experiences and observations one has encountered.

This study uses an inductive approach because it is consistent with an exploratory approach designed to increase understanding of the phenomenon by developing a thick, rich description. This approach has been used in other investigations on natural resource conflicts (Dumont 1996; Phyne 1996; Weeks 1995).

Quantitative and Qualitative

The form of the data which is to be collected and analyzed is another consideration in research design. The type of data collected acts as a bridge between the study’s purpose and the methodology utilized in the investigation. The data must be appropriate for both the question at hand and the methods used for answering that question. The form of the data collected can be quantitative, qualitative or a melding of these two types.

Quantitative data is associated with a positivist theoretical approach and nonreactive research. Quantitative data presents information numerically and is a result of primary and secondary sources (Neuman 1994:28). Qualitative data is generally associated with critical and interpretive theoretical approaches. Qualitative data comes in the forms of words and images (Neuman 1994:30). Quantitative and qualitative data have strengths and weaknesses and neither type is necessarily better than the other; rather the topic and purpose at hand will lend itself to a particular type of collection. The data utilized in a study is also constrained by the availability or access to quantitative or qualitative sources.

The purpose of this study is to develop a rich description of the conflict between commercial fishermen and management agencies. Interpretive theory was
utilized in the development of the description of the conflict. The use of grounded theory in the interpretive approach extracted the themes which emerged from the description. The themes which emerge from the rich description of the phenomenon were filtered through a sociological lens (conflict theories of Weber and Marx) in order to uncover the underlying structures and functions which contribute to the conflict (Figure 3). The intent of this study makes the use of qualitative data a more appropriate choice than quantitative data because it seeks to have the stakeholders involved in the conflict identify the issues. This inductive approach uses grounded theory to link the experience to a broad sociological theoretical framework. Qualitative data serves as a bridge making this link possible and reliable.
Figure 3.

Research Perspective

Fishing Regulation Conflicts

Views of Fishery Management Agencies & Commercial Fishermen

Themes

Sociological Theory

Underlying Structure & Functions Contributing to the Conflicts
Methodology

The following section offers a brief review of common sociological methodologies and draws information primarily from the texts of Neuman (1994) and Chadwick, Bahr & Albrecht (1984). The method of data collection is determined by the type and purpose of the study, the constraints associated with the research (i.e., time, money), the type of data desired (quantitative or qualitative) and the source of the data (primary or secondary). After the review of methodologies the methods employed in this study will be discussed in detail.

Experiment

The experiment is a classic scientific methodology and can be conducted in the field or in a controlled laboratory setting. It yields quantitative data and is designed to test hypotheses. This methodology involves the researcher manipulating one or more independent variables to determine the effect on the dependent variable. One strength of this methodology is that it can identify causal relationships. However, due to the necessary control of the study setting, this method carries the disadvantage of being limited in making generalizations to the entire population and being representative of the real world.

Secondary Analysis

Using existing statistics or assembled data sets is another approach to conducting social research. In this approach, previously collected data sets undergo new analysis and are used to answer new research questions. This method usually taps
quantitative data sets such as census data. The benefits of this approach are that it is cost effective and it offers the opportunity for comparative studies across cultures and time. There are constraints with using this type of data analysis, including: the availability of the needed data, errors in the data set and the form in which the data is published may not be conducive to the researcher's needs.

Content Analysis

Content analysis is a form of secondary analysis which is designed to investigate social relationships and behavior through communication. This approach can use any form of communication, and therefore, the data may be quantitative or qualitative. Sources for analysis include information: written, photographed, spoken, or drawn. Generally, this method is associated with interpretive or descriptive research. The strength of this method is that the researcher is able to infer information about the person or group disseminating the information and the impact of the information on the receiver. Content analysis has the benefit of having readily available data sets and giving the researcher an opportunity to gain access to a potentially isolated or closed populations. The main drawback of this approach is that it is difficult to establish causal relationships.

Survey Research: Interviews & Questionnaires

Survey research, "...sample[s] many respondents who answer the same questions...measure[s] many variables, test[s] multiple hypotheses, and infer[s] temporal order from questions about past behavior, experiences or characteristics" (Neuman 1994:225). Survey research often uses interviewing as a method of data
collection. Interviews can be structured or unstructured depending on the type of information the researcher wishes to compile. There are many forms of interviews including: face-to-face interviews, telephone interviews, rigidly structured interviews, guided conversations and completely open-ended interviews. Based on the demands imposed by the research question(s), an interview instrument can be tailored to gather quantitative or qualitative data. The strength of this method is that the researcher has the flexibility to tailor the questions to the research topic of interest. Another benefit of interviewing is that it results in primary data sets regarding the research topic.

The questionnaire is similar to the interview instrument but is usually self-administered by the respondent. Questionnaires may be used during interviews, and therefore interviewing and administering questionnaires are not necessarily mutually exclusive. Questionnaires can produce quantitative and qualitative data sets and be used in a wide array of research approaches and purposes. The questionnaire is generally delivered in person or in the mail. The strengths of the questionnaire approach include: enabling the researcher to target a specific topic, collecting highly detailed information and using a primary source.

There are several concerns which warrant consideration regarding survey research. One potential problem is that the survey instrument may produce misleading results. It is vital that the survey instrument be valid. For an instrument to be valid it must be measuring indicators (variables) which are responsible for the phenomenon (Neuman 1994:130). Another issue to be concerned about is representation of the sample to the generalizable population. There are many opportunities for bias to infiltrate the interview or questionnaire data process, therefore, the researcher must conduct a critical review of the survey instrument. The return rate for mailed
questionnaires tends to be low compared to other methods, and should be considered when selecting the methodological approach of a study.

Participant Observation and Field Research

Participant observation is a data collection method that examines qualitative information of a social phenomenon. This data collection strategy has the benefit of providing the researcher with direct access to the social phenomenon. Observational methods are flexible and can be conducted in settings ranging from highly controlled to natural or field settings. This primary data collection technique comes with some disadvantages. As with other data collection methods, it has the potential to produce information which is not representative of the population or phenomenon as a whole. Another consideration which the researcher must be aware of is his/her filtering system. Inevitably, the researcher will concentrate on some aspects of the social phenomenon and discount others which can lead to a perception of the situation which may not be an accurate account.
Methodology Implemented

The purposes of this investigation are to: 1) provide a rich description of the conflict between commercial fishermen and fishery resource management agencies, 2) uncover the underlying structures and functions which contribute to the conflict by applying social theories and 3) identify leverage points and recommend changes which impact the underlying structures and functions for bringing about a decreased level of conflict and an increased level of cooperation. The specific objectives of the study are:

Objective 1. To investigate the relationship between fishermen and fisheries managers in terms of how fishermen acquire information regarding the management of the fisheries they participate in and how they participate in the decision making process.

Objective 2. Determine how much impact the fishermen perceive management policies and programs have on their ability to sustain their fishing operations.

Objective 3. Identify how fishermen gain information on current and proposed regulations. Compare and contrast the efficacy of different sources (formal and informal) of information.

Objective 4. Explore the effect of fishery regulation information on fishermen behavior as a function of the source of the information.

Considering the philosophical and theoretical foundations of this investigation, along with the type and purpose of this research, the methodologies reviewed in the previous section have varying levels of appropriateness. Given the frameworks guiding the research, ethnographic methodologies and interview techniques are the most appropriate techniques, primarily due to their ability to reach the research objectives while staying within the confines of the guiding
frameworks. Other research studies on related topics have employed ethno-graphic methods (Dumont 1996; Phyne 1996; Weeks 1995).

The ethnographic and interview techniques which were used in the investigation offered an opportunity to address the specific research questions regarding fishing regulation conflicts. Research was conducted in the field using guided conversations. An interview protocol (appendices A & B) was developed based on the research questions which came from related studies and the objectives of this investigation (Smith & Hanna 1993; Smith 1995; Smith & Jepson 1993). The research questions which were developed from the study's objectives (outlined on pg. 28) include:

Do management policies have an effective impact on fishermen? To what extent?

What information and communication systems do fishermen use in order to gain information on current and proposed regulations?

Are some sources of information better than others? Why?

Do fishermen react differently to the information they acquire depending on the source of the information? How does the value assigned to the source of the information affect their behavior?

What changes would fishermen and management agency personnel like to see regarding regulation / management information and communication systems?

The interview protocol was used to guide discussions with the informants. The interview protocol was designed but not strictly followed question by question; rather, the instrument is a guide,

"...not a tightly structured set of questions to be asked verbatim as written, accompanied by an associated range of preworded likely answers. Rather, it is a list of things to be sure to ask when talking to the person being interviewed...the interview instrument is called a guide rather than a schedule or questionnaire. You want interviewees
to speak freely in their own terms about a set of concerns you bring to
the interaction, plus whatever else they might introduce. Thus,
interviews might more accurately be termed guided conversations" (Lofland & Lofland 1995:85).

One benefit of using guided conversations as the primary data collection method is
that they are conducive to informal field contacts and experiences. Structured
interviews were attempted on several occasions, however, they were found to be
awkward and often resulted in the informant becoming less talkative about the issues.
Guided conversations were conducted in person and over the telephone with
commercial fishermen, commercial fishing industry leaders and management agency
personnel.

Data was also collected through participant observation techniques. The
field environments for conducting participant observation include: the commercial
fishing docks of Newport, Garibaldi and Brookings, OR; Pacific Fishery Management
Council (PFMC) meetings and local gathering places of fishermen (coffee shops,
restaurants, taverns). Field observations were fundamental in adding texture to the
context of the research topic. Observational data was also useful in providing an
informal “test” of the data collected by guided conversations (i.e., did the
unobtrusive observations coincide with the data collected in guided conversations?).

Other sources of information were perused for background on the topic. A
formal content analysis was not conducted for this study, but material from local
newspapers, journal articles, social and fishery science conferences, fishing industry
publications, the FISHFOLK internet listserv group and management agency
publications were reviewed throughout the research project for the purpose of
broadening the breadth and depth of the topic. This informal content analysis /
background research developed the shell of contingencies of the research topic. Thus,
related aspects of the conflict involving fishing regulations and the decision making
process were identified and connected to the principle research objectives and offered a context for the rich description of the conflict between commercial fishermen and management agencies which emerged from the field.

The triangulation of methods serves several purposes. Firstly, it offers different vantage points from which to view a common phenomenon. Secondly, it can help increase the reliability of the data by cross checking the data sets associated with different collection techniques. Another benefit is to increase the potential of accessing a broader sample and a greater variety of perspectives.

Study Participants

The participants of this study were determined by the purpose and structure of the research design. The central topic of the research concerned the conflict involving fishing regulations and the regulatory decision making process. Therefore, the participants of the study include: commercial fishermen, commercial fishing industry leaders, commercial fishing family members, Oregon Department of Fish and Wildlife personnel, National Marine Fisheries Service personnel, Pacific Fishery Management Council members, and fishery biologists.

Sampling Method

The sampling methods used in this investigation include: random sampling, convenience sampling and snowball techniques. The sampling technique used was dependent upon the data collection method being employed and the participant being contacted. Informants identified through random sampling were participants of the "Resource Reliance in a Social Context: Human Capital in Fishing Communities,"
Informants contacted through convenience sampling were encountered in the various field environments or from industry and management agency directories. Informants identified through snowball sampling were those suggested or referred to by other informants.

The design of the "Resource Reliance in a Social Context: Human Capital in Fishing Communities, Businesses and Families" study designated 15 fishing reliant families in three different communities along the Oregon coast to be part of an in-depth face-to-face survey. The communities were selected using three main criteria: 1) the community must have an active commercial fishing port, 2) one community will be located in the northern portion of the coast, one community will be located in the central portion of the coast and one community will be located in the southern portion of the coast and 3) the three communities must be of different total population sizes.

The first criteria (having an active fishing port) was identified because it indicates current commercial fishing activity and produces a source of data on fishing activity through time for the community. The second criteria (geographical area) was identified for comparison reasons. Having three communities from three areas of the coast allows for comparisons of how fishing communities vary geographically. The third criteria (community population size) was identified for comparison reasons. Comparing communities of varying population sizes offers assessment opportunities regarding the level of infrastructure development and the functioning community services. Based on these criteria the following Oregon communities were selected: Brookings, Newport and Garibaldi.

In order to obtain a complete list of commercial fishermen who reside in these three communities, four types of commercial fishers were identified: 1) those who
moor their vessels and land their catch in the community in which they reside, 2) those who moor their vessels in their community's port, and fish and land their catch in another community, 3) those who moor their vessels in another community's port and fish and land their catch in the community's port which they reside and 4) those who moor their vessels, fish and land their catch outside of the community which they reside in (Davis 1996). Two types of data sets were acquired in which to identify these four types of commercial fishermen, port mooring lists from Brookings, Newport and Garibaldi OR; and commercial fishing license lists from the Oregon Department of Fish and Wildlife, the California Department of Fish and Game, the Washington Department of Fisheries and the Alaska Department of Commercial Fishing Records. The combination of these lists is intended to produce a near complete listing of vessel owners and skippers but not as complete a listing of crew members. These lists were cross referenced for repeating entries and a final list was produced, from which a random sample of fifteen people from each community were selected. Table 4 displays the communities and sampling frame for the Human Capital project.
A random sample was drawn from the sampling frame and the fishermen were notified by mail that a researcher might be contacting them about fishing issues on the Oregon Coast. Once identified from the random sample, fishermen were informed of the survey, asked if they would be willing to participate and given a set of screening questions. Screening questions were intended to identify respondents who were currently active in the commercial fishing industry. If the selected fishing family did not wish to participate or did not meet the requirements of the survey, another fishing family would be randomly selected until there were 15 qualified, consenting participants. Interviews were scheduled with the commercial fisherman, their spouse or partner and their children (if applicable).

During the Human Capital interview the informant(s) would often introduce the topic of fishing regulations. When this occurred probing questions were asked in order to have respondents expand upon their experiences and perceptions of fishing regulations, the management of commercial fisheries and the regulatory decision making process. At this point in the interview process, a guided conversation would

<table>
<thead>
<tr>
<th>Community</th>
<th>Total 1994 Population</th>
<th>Geographic Region</th>
<th>Number of Fishermen in Sampling Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garibaldi</td>
<td>935</td>
<td>North Oregon Coast</td>
<td>59</td>
</tr>
<tr>
<td>Newport</td>
<td>9075</td>
<td>Central Oregon Coast</td>
<td>437</td>
</tr>
<tr>
<td>Brookings</td>
<td>5100</td>
<td>South Oregon Coast</td>
<td>215</td>
</tr>
</tbody>
</table>
ensue. In some cases a follow up conversation either in person or over the telephone would be arranged, especially if the scheduled interview was under a strict time constraint.

In the field (commercial fishing docks, PFMC meetings and public gathering places) individuals would be approached and a conversation would be initiated. Sometimes fishermen would initiate contact and ask, "Looking for someone?" or "Can I help you Miss?". A useful conversation strategy was to inquire about the fishing season, comment on the rigging on their vessel or use other comments indicating an awareness of the fishery which they were participating in. If the individual seemed interested in talking, the guided conversation would take place. However, if the individual seemed too busy or disinterested, they were wished good luck with their season and the encounter would end.

A typical encounter on the docks would go like this,

Informant (I) "Are you looking for someone?"

Researcher (R) "No, I'm just looking around, doesn't seem too busy here today"

(I) "Yeah, this is the first bit of clear weather we've had in a while"

(R) "Are you currently crabbing? I hear the season isn't very good this year"

(I) "No, the season is a tough one. Who do you work for?"

(R) "I'm involved in a project about fishing communities and I am interested in learning about the regulation process"

(I) "What do you want to know about it?"

(R) "I am interested in how the process works and if it is fair to those affected by the regulations"

(I) "Well let me tell you young lady...."
New informants were usually gained in this casual manner and often they would extend an invitation on to their boats, offer their business cards or invite future contact to answer additional questions.

When using the snowball technique for obtaining informants, the referral would be contacted, introductions made, an explanation indicating they had been suggested as an expert in the field was offered and they were asked if they could answer some questions. The guided conversation protocol would then be implemented. This procedure yielded favorable responses and cooperation.

When representatives of management agencies were contacted, the same protocol was utilized as in the snowball technique. The guided conversation worked particularly well in face-to-face discussions. However, the dynamics of the interaction between the researcher and the informant varied depending on: the individual, the sampling technique used to contact the informant and the format of the conversation (i.e., face-to-face or telephone). Thus, depending on these circumstances a more structured conversation would be employed sometimes by asking directed questions in order to facilitate the discussion.

Conversations were recorded in a field notebook or on a tape recorder depending on the situation. If the encounter was informal or unplanned, the information was usually recorded in a field notebook. In formal situations, such as the Human Capital interviews, the information was usually tape recorded and notes were taken, with the permission of the respondents. After all of the data was assembled comments and discussions were organized by topic. The organized topics were then condensed into themes. The themes which were most prevalent were then subjected to a sociological analysis.
The results of the survey come from a variety of informants, including: commercial fishermen, commercial fishing family members, fishing industry leaders and management agency personnel. The field encounters which are described in Table 5 are those in which guided conversations focusing on fishing regulations were employed. Other encounters which did not specifically focus on fishing regulations were used as background information to add texture to the encounters and provide a context for the phenomenon being investigated. For example, some of the informants spoke of the history of commercial fishing, their experiences, their community or seafood processing issues. These encounters were used to broaden the understanding of the commercial fishing industry but were not used in the analysis of fishing regulation conflict and thus are not included in Table 5.

Fishermen in this study were identified through: the "Resource Reliance in a Social Context: Human Capital in Fishing Communities, Businesses, and Families" (HCP) Sea Grant project, snowball techniques (SB) where participants offered referrals for other people involved in commercial fisheries and through convenience sampling (CS). This triangulation of methods proved valuable since the sampling frame used in the Human Capital project did not have a complete list of all of the active fishermen in the community. Industry representatives and fishery management agency personnel were primarily contacted through directory listings (DR) and snowball sampling. The sample was considered complete when the issues brought up in the discussions were repeated and referrals were exhausted.
Table 5.

<table>
<thead>
<tr>
<th>Informant</th>
<th>Number</th>
<th>Affiliation with Community /Agency</th>
<th>Acquired By*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fishermen</td>
<td>7</td>
<td>Newport</td>
<td>HCP</td>
</tr>
<tr>
<td>Fishermen</td>
<td>7</td>
<td>Newport</td>
<td>CS &amp; SB</td>
</tr>
<tr>
<td>Fishing Family Member</td>
<td>9</td>
<td>Newport</td>
<td>HCP</td>
</tr>
<tr>
<td>Fishermen</td>
<td>6</td>
<td>Garibaldi</td>
<td>HCP</td>
</tr>
<tr>
<td>Fishermen</td>
<td>1</td>
<td>Garibaldi</td>
<td>CS</td>
</tr>
<tr>
<td>Fishermen</td>
<td>9</td>
<td>Brookings</td>
<td>HCP</td>
</tr>
<tr>
<td>Fishermen</td>
<td>4</td>
<td>Brookings</td>
<td>CS</td>
</tr>
<tr>
<td>Fishing Family Member</td>
<td>6</td>
<td>Brookings</td>
<td>HCP</td>
</tr>
<tr>
<td>Total Number of Fishermen</td>
<td>49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry Leaders</td>
<td>6</td>
<td></td>
<td>DL &amp; SB</td>
</tr>
<tr>
<td>Management Personnel</td>
<td>4</td>
<td>PFMC</td>
<td>DL &amp; SB</td>
</tr>
<tr>
<td>Management Personnel</td>
<td>4</td>
<td>ODF&amp;W</td>
<td>DL &amp; SB</td>
</tr>
<tr>
<td>Total Number of Management Personnel</td>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Key
HCP = Human Capital Project interview
CS = Convenience Sampling / Informal Meeting
SB = Snowball Technique and Referrals
DR = Directory Listings
Results / Themes

During the course of the field work, there were a variety of viewpoints which were encountered and many issues were raised. Despite the diversity of voices, several themes emerged. The general themes described in this thesis were not expressed by all of the informants; rather, the following discussion reflects the seven most common themes which emerged: 1) Lack of Representation, 2) Competing Funds of Knowledge, 3) Frustration Keeping Informed, 4) Politics and Bureaucracy, 5) Lack of Organization, 6) Threatened Culture and 7) Poor Communication.

Lack of Representation

The first theme that emerged is that commercial fishermen feel as though they are not adequately represented, and have no voice in the regulatory decision making process. Many of the fishermen felt that they were not respected by biologists and policy makers, that their involvement in the decision making process is only superficial, they are unable to have an impact on the decisions which are being made and feel they have no power or control. For instance,

*Management tries to make fishermen part of the process and they take fishermen’s input but then do what they want with it. The Council [PFMC] doesn’t “hear” shrimpers (Newport shrimper).*

*Why would you want to talk to us, the scum of the earth? We don’t have any respect with management agencies, government or the public. The management agencies don’t listen to our needs or consider our understanding of the resource and are only concerned with their biological computer models which aren’t representative of the environmental and biological conditions of the sea (4 fishermen at Newport Port Dock 5).*
Management decisions are based on money then biology, if the agencies didn’t have to have public comments they wouldn’t. The decisions are canned during the comment periods anyway (Garibaldi crabber).

There is no shrimper represented on the PFMC sub-committee and there should be. I go to meetings when I can but I can’t always make it since I am busy fishing and can’t afford to go to San Francisco. When I do attend meetings, it doesn’t matter because they have already made their decisions (Newport Shrimper).

These comments reflect the disconnection felt by fishermen in the decision making process and a lack of respect. Oregon coast fishermen are not unique in feeling alienated from the process (Jentoft & Sandersen 1996; Breton et. al. 1996; Wallace 1996). In a study of Florida’s fishing industry, fishermen and fishing communities were found to be in the decision making process, "...the emphasis on scientific research and bureaucratic management [results in] fishers, their families, and communities [being marginalized and] ... removed from the decision making process" (Smith & Jepson 1993:47).

Competing Funds of Knowledge

The second theme which emerged is that there are two competing funds of knowledge on which to base management decisions: science and experiential data. Informants were critical of the scientific information used to support management policies. In particular, fishermen are concerned that the scientific data is not representative of the current conditions. Commercial fishermen were skeptical of the results which fishery biologists extract from their stock assessments and computer models, primarily due to the complexity of marine ecosystems that they believe cannot be reduced to a few variables operating in a model.
On the other hand, some of the fishery biologists suggest that the experiential data which commercial fishermen profess is not representative because it comes from samples which are not randomly selected or acquired through scientific methods. These biologists suggest that the higher stock assessments which are proposed by commercial fishermen are due to their fishing prowess. Skepticism was expressed in statements such as,

*Computer models do not mirror mother nature.*
*Fishermen are considered scumbags and we don’t have any input. The government is trying to put us out of business. The government doesn’t know what a fish is or what it takes to get one. Only the upper status biologists and computer modelers on councils make the decision when they don’t know what’s involved. Those in power are illiterate to the needs of the industry (4 fishermen at Newport Port Dock 5).*

*If you get the biologists alone they will admit that there is something wrong with the model but when they are speaking to the council they align themselves with the data (PFMC Council member).*

*The PFMC assessors use the data they want to (i.e., they choose what they want to prove); that’s why you get bogus yellowtail rockfish numbers (Industry leader).*

*The at sea surveys are conducted every three years which is not often enough and then they don’t survey where the fish are resulting in low estimates (Newport shrimper).*

*Do we want a computer answer or a human answer? (PFMC member).*

*Fishery biology is not an exact science, there are a lot of holes in the knowledge - something is missing in the yellowtail equation because there are too many indicators that the stock is higher (Industry leader).*

These comments reflect similar findings in other research projects (i.e., Waterman 1997; Weeks 1995). The status or level of respect, of experiential knowledge tends to
be low; whereas scientific knowledge tends to be high, "Fisheries scientists often have held such information [experiential data] in low regard as too anecdotal and not sufficiently quantifiable. Scientists like numbers; fishermen have only their memories" (Waterman 1997:20). The information presented by scientists and fishermen are not always contradictory; in fact, the data often represents the same phenomenon but utilizes different measurement instruments and language to communicate the findings. As noted by Weeks, "Although the primary difference between folk and scientific constructions stated... seems to be one of seroantics, versus content, it is the scientific construction which is privileged in the formation of regulations" (Weeks 1995:433). Such findings reflect the distrust which these two groups have of one another's knowledge.

Frustration Keeping Informed

The third theme which emerged is that respondents exhibit a high level of frustration associated with the ability to keep informed of current regulations. Both commercial fishermen and management agency personnel expressed dissatisfaction with the efficacy of information exchange on fishing regulations. Comments on fishing regulation information exchange systems focused on: language that is difficult to understand, the constant changing of regulations, the timing of regulation decisions, the accuracy of the information and the lack of direct dialog between the regulators and regulatees. For instance,

*If we put our efforts into tracking the regulations we wouldn’t have time to fish* (4 fishermen at Newport Fort Dock 5).
I attended the management meetings but the result was "heart attacks" and "high blood pressure" I'd just leave trying to forget about it (retired Garibaldi Fisherman).

I try to keep up with the regulations but the wording is muddled (Newport fisherman).

It is hard to keep up with the changes in regulations, I hire a captain and two crew and the captain is in charge with dealing with the regulations. The mailings you get from the council aren't enough to keep up with the changes (Garibaldi fisherman).

The information does get to the fleet but the smaller details are more difficult to get to and have to be actively sought out by fishermen (Fishery manager).

The difficulty in keeping up with the regulations is related to the marginalization of fishermen in the decision making process and the lack of direct communication between fishermen and management agencies. These issues are consistent with previous research in this area (Jentoft & Sanderson 1996; Breton, et. al. 1996; Wallace 1996; Weeks 1995). Discourse between fishermen and management agencies is unlikely to be found in, “...highly centralized systems and in systems where power has not been delegated to the local level” (McCay & Jentoft 1996:246). The difficulty associated with keeping informed of regulations stems from the lack of direct communication between the fishing industry and regulatory bodies.

Politics and Bureaucracy

A fourth theme coming from the field encounters is the sense of frustration with the politics and bureaucracy of fishery management agencies. Fishermen cited the bureaucracy of the management agencies as a significant factor limiting their participation in the decision making process. Fishermen and management personnel
also described the PFMC and other agencies as politically laden and the management decisions being politically driven,

There are problems with big business and their ties to management. The whiting industry lands a lot of tonnage and the state gives the whiting fishery no limits on bycatch (Newport shrimper).

There is apathy and a feeling of helplessness that fishermen feel about getting involved in management politics (Garibaldi crabber and salmon fisherman).

The poor management of the fisheries is due to politics. The PFMC is heavily based on salmon and not the rest of the fisheries due to the history of politics and lobbying (Brookings salmon fisherman).

The council is heavily laden with salmon people and has the Idaho representation which isn't appropriate for ocean fisheries. The Ad Hoc committee set up to look at the sablefish fishery is an attempt to redistribute the power equitably (Astoria fishing family member).

Limited entry went through last minute changes due to lobbying by individuals who have clout and experience with councils and politics (Newport shrimper/scallop dragger).

The bureaucracy and politics operating in the PFMC and Pacific Northwest management agencies is not unique. In a study of a Texan management agency, Weeks (1995:434) found, "TPWD's (Texas Parks and Wildlife Department) actions are perceived as being guided by political expediency and bureaucratic irrationality instead of rationality (from a scientific perspective) or fairness (from a fisher perspective). [The] TPWD is viewed by fishers and university scientists alike as "the state" powerful and allied with special interests which use that power to their own ends". In a study of Florida fisheries, bureaucracy was also cited as an impediment to fishermen's participation in the decision making process, "...the bureaucratic system
and decision making process governing Florida's inshore net fishing industry gives influence and advantage to individuals and groups laying claim to certain sources of scientific, social or political power" (Smith & Jepson 1993:47). This theme of politics and bureaucracy inhibiting effective management practices and involvement in the decision making process, transcends geography and fishery management agencies and levels of government.

Lack of Organization

Fishermen have a sense of helplessness about their situation. Their frustration regarding their perceived inability to effectively participate in the decision making process is compounded by their belief that they have independent interests which can not be adequately represented by an organization. Organizing is not always a viable alternative in fishermen’s eyes. The inability to organize in order to gain a voice was another theme encountered,

*Fishing organizations don’t work because you can’t get people together, everyone is looking out for their own self-interest* (Garibaldi fisherman).

*The people who become involved in fishing organizations are rich and or self serving. They do NOT represent fishermen since all fishermen are in competition with each other as private businesses. Participating in management decision making processes is highly political* (Newport fisherman).

*The commercial salmon fleet doesn’t have any cohesion, it is made up of independent interests lobbying for personal reasons. Personal agendas divide the issue and results in lots of bickering* (Garibaldi crabber and salmon fisherman).

*Fishermen are not organized since they are independent and don’t agree with each other* (ODF&W biologist).
Several recent studies indicate similar findings; for instance, McCay and Jentoft (1996:241) note that, "...fishers have had great difficulty developing "one voice"...their fragmentation is intensified, if not caused,...by past management policy". The impediments to organizing come from a variety of divisive factors including: material conditions such as vessel size, technology, gear wars, fishery participation, past management decisions and the independence and individualism which characterizes commercial fishermen. Whatever the cause of fragmentation the, "...absence of community cohesion and cooperative institutions at the community level is prevalent and reduces the capacity for collective action for mutual support and self-sufficiency" (Jentoft & Sandersen 1996:301). "The mode of production... engenders an atomistic organization of labor, which result in a culture and psychology of independence... [which] constrains their ability to act collectively" (Thomas, et. al. 1995:144). The inability to organize affects fishermen's representation in the decision making process since fishermen are either unwilling or unable to involve themselves personally.

Threatened Culture

There is concern that fishing as a way of life is being threatened. The identity of commercial fishermen is endangered in the eyes of fishermen and some management personnel. Changes in the industry such as the consolidation of permits by corporations and the increasing level of regulations which fishermen must contend with have dramatically changed the culture of fishing as a occupation. For instance,
Used to be that fishermen were pipe dreamers. Now the economics of the industry limit that, the overhead is high. The insurance is needed whether you are fishing or not costs $235 per day (Garibaldi fisherman).

The pressure on the industry today is huge, large boats are coming down from Alaska and are shortening the season, so now small boats have a hard time making a family wage (Garibaldi Fisherman).

I Like my life and what I do. It fits my easy going self. I wouldn’t fish for a factory boat if that was the only option. I like fishing because it is independent, you are testing yourself against nature. You do the best you can. Factory trawlers are taking the independence out of industry. (Garibaldi crabber and salmon fisherman).

I was brought to the occupation due to a drive to be connected to something real. When I fish I am connected to the natural world. I like the independence and the interdependence with the environment (Newport fishing couple - man).

There has been substantial anthropological research on fishing communities as occupational communities with a distinct culture (Davis & Bailey 1996; Thomas, et al. 1995; Smith & Hanna 1993). The findings suggest that there are social, cultural and psychological characteristics which are associated with the fishing industry, "...the idea of fishermen independence actually refers to at least three realities: economic (where captains own the boats they command), cultural or ideological (shared beliefs about the autonomy of fishermen), and psychological (personality characteristics that result from the nature of work)" (Thomas, et al. 1995:143). The material conditions of a fishing community have been cited as the functioning force which organizes the structure and relationships of the fishing culture, "...local level social conditions, specifically the social relations of exploitive appropriation, ethnic and gender relations, and captain-crew relations, [are] dimensions in the topographies
of community life that situate identifiable social groups differentially with respect
to access, participation, and the distribution of material benefits" (Davis & Bailey
1996:263). The individual and social characteristics found in this investigation are
echoed in fishing communities throughout the world giving support to the hypothesis
that the culture of the fishing industry is materially based.

**Poor Communication**

Finally, fishermen and management agency personnel commented that the
communication between commercial fishermen and management agencies is
inadequate in terms of it’s accuracy, efficiency and timelines. Many sources of
information regarding fishing regulations were identified by the informants,
including: newspapers, organizations, mailings, from management agencies and the
grapevine. Interestingly, none of these various sources were viewed as singularly
providing clear, timely, relevant and accurate information, as the following excerpts
indicate:

*Fishermen get information on fishing regulations from
a variety of sources - the commodity and gear
commissions, mailings from NMFS, PFMC and
ODF&W, port biologists, trade magazines, state
police with the commercial fishing department and
the "Notice to Mariners" and broadcasts by the Coast
Guard. Fishermen can't attend meetings due to their
schedules - fishermen's schedule doesn't match the
rest of society's schedule (Industry leader).*

*The mailings you get from the council aren't enough to keep up with the changes. The processors keep up
with the regulations and act as a liaison between the regulators and the fishermen. Management enacts the
policy and informs the plant but there is a lag between the plant informing the fishermen and the
relationship between the plant and the fishermen is sketchy. If the fishing boat is leased then the person*
who leases the permit is not directly informed by the management agency - the loop breaks down there. There is lack of communication between the regulators and the person operating under the permit (Garibaldi fisherman).

There is a weak link in communicating regulations to the fleet which occurs when the management plan is sent to the Secretary of Commerce and then goes into the National Register. Fishermen don't have good access to the information at this point (Fishery biologist).

Local newspapers have regulation information but are not very reliable. Enforcement officers on the docks can give information to fishermen but fishermen don't trust this source and aren't likely to go to these people. When you purchase a commercial license through a state agency you receive their "boiler plate regulations" but this publication tends to be too general and is not a great source for commercial regulations. The grapevine also is a source of information but is the most prone to misinformation (Industry leader).

The lack of direct, effective communication between the fleet and the management agencies is related to the themes discussed above. The politics and bureaucracy which is pervasive in the decision making process extends into the communication outreach phase of policy implementation. The frustration that fishermen expressed with the politics, bureaucracy and structure of the system also limits their activity in the decision making process and seeking out the necessary information. As noted by Smith & Jepson (1993:47), "... Fishers denounced the increasing political pressure on fisheries management [yet] claimed that they were too angry about the system's biases to participate in the decision making process." Effective communication is important to the management of fishery resources because communication determines how well the policies and prescriptions are executed. The success of management plans are dependent upon the communication between the stakeholders and the
cooperation of those affected by the policies and their behavioral choices to follow
the guidelines or to act outside of the law (Peyton 1987; Schramm & Hubert 1996).
Analysis

The purpose of this study was to uncover the underlying structures and functions which contribute to the conflicts over fishing regulations. To achieve this purpose the study has been designed to: 1) gather data from the field, 2) apply a sociological filter and 3) illuminate the underlying contributing factors at work. These three steps are analogous to opening a locked door. On one side of the door is the empirical world or the field where the data exists. The themes which emerged from the field will be used as the primary keys to understanding the conflict between commercial fishermen and management agencies. These keys need a context or lock in order to function. Social theory provides the lock which these keys can be inserted and understood. On the other side of the door is an image of the conflict as seen sociologically. The view of the conflict on the other side of the door is a result of the keys (empirical data) passing through the lock (social theory). This research does not attempt to test social theory, rather, it uses sociological theories as an analytical tool to bring about a better understanding of the conflicts over fishing regulations.

The contextualist perspective argues that the independent parts of a phenomenon can not be fully isolated or understood from the whole and the other parts interacting in the system. This perspective is useful in understanding that the themes which emerged from the field are interrelated. However, the conflict phenomenon is too large to be viewed as a whole, therefore, the themes will be analyzed independently. Despite the independent treatment of the themes their interrelatedness has the potential to reveal common underlying structures and functions operating in fishing regulation conflicts.
The variety of themes which were produced by this investigation suggest that a single sociological theory might not be appropriate or sufficient to analyze all of the themes. Therefore, a theoretical perspective will be chosen depending on its' ability to explain why the theme has emerged. Some of the themes shed light on structures and functions operating on a large scale while other themes point to structures and functions which are operating on a smaller scale. For organizational purposes, those themes which are best understood by sociological theories operating on a large scale will be analyzed first (i.e., threatened culture, lack of organization and politics and bureaucracy). This will be followed by the themes which are best understood by the application of social theory to smaller units of analysis (i.e., lack of representation, competing funds of knowledge, frustration keeping informed, lack of organization and poor communication). It should be remembered that the societal, institutional and organizational level of analyses which are focused on in this project are also interrelated and therefore what happens at one level has impacts on other levels.

**Rationalization of Fisheries**

Weber’s theory of rationalization has four fundamental dimensions: calculability, efficiency, predictability and a decreased level of human involvement. Rationalization theory operates at the societal level and can be used to understand why modern society has a high level of bureaucracy and upholds the principles associated with scientific management and assembly line production (Ritzer 1996:25). There are also two outcomes of rationalization: the iron cage of rationality and the irrationality of rationality (Ritzer 1996:121 & 143). These outcomes of the rationalization perpetuate the process and undermine its' intent respectively.
As in other modern industries, the fishing industry has been transformed. Historically the fishing industry had low levels of capital investment and technology and was comprised of many individual businesses. This venture has transformed to an industry that requires a high level of capital investment and technology and is comprised of fewer, but larger businesses. The process of rationalization can be used to understand why the fishing industry has undergone this transformation. The change in the fishing industry is a result of a change in its' material condition (i.e., technology) which impacts the structure of the fleet (i.e., many small businesses changing to fewer, larger businesses). Technological innovations include: hydraulic hauls, electronic "fish finders", synthetic fibers and on-board freezing facilities. These technologies have increased fishermen's calculability since they know how many fish can be frozen in a given amount of time; and has increased efficiency since it takes less time to get the fish on board using a hydraulic haul compared to man power. Utilizing sonar and echo-location fish finding devices has increased predictability since fishermen can "see" where the fish are. Thus, the human element has been drastically reduced due to the adoption of such technology. The increased use of technology has increased fishermen's control over fishing effort since they rely on machines rather than deck mates. The components of rationalization, (increased calculability, efficiency and predictability with a decreased level of human involvement) are evident in the commercial fishing industry. Adopting technology brings the advantages of rationalization, and the bottom line is that technology has increased the harvest levels.

The rationalization of the fishing industry has lead to fishermen being caught in a reinforcing feedback loop of getting in debt due to investments in technologies in order to remain competitive in the industry. This feedback loop of
investment and debt can be understood by the theory of rationalization which includes a condition of being trapped in the iron cage of rationalization (Ritzer 1996). Fishermen are "forced" into the iron cage because they must invest in these technologies if they wish to continue to remain in the industry. These technologies are not cheap, and therefore, the fishermen are placed in a state of debt. This means that even if the fisherman is harvesting more fish by implementing the technology, they may not be economically better off since the increased production drives prices down and they have greater operating costs due to their investments. This iron cage explains why the faces of the fleet have changed from many small, independent operations to a few larger and often corporate owned operations. The rise in capital investments necessary to participate in commercial fisheries today limits the number and size of the operations in the fleet. Larger operations which are owned independently or by corporations are better able to make the necessary investments than smaller operations, and therefore, have been able to remain in the fleet while small owner-operator businesses leave the industry.

The changes in the fleet have also changed the culture of the fishing industry. The rugged individualism which typified the identity of the small owner-operators of yesterday's fleet is being challenged by a new identity of savvy economic, political and business dealings promoted by large operations and corporations. The homogenization of the fleet, from many diverse operations to a few large businesses, is seen as a direct threat to those individuals' identity which is tied to the traditional fishing industry.

The greater technological efficiency of the fishing industry, has resulted in higher harvest levels, but has simultaneously resulted in the decline of many fisheries. With the decline of fish populations, fisheries management agencies have
imposed regulations limiting or forbidding the harvest of imperiled stocks. Thus, the result of higher harvest levels has had the unintended result of reducing stocks to a level at which management agencies have exerted control and limited or ceased further fishing activity. This unintended result can be understood as the irrationality of rationality. Ritzer (1996:121) states that, “Rational systems inevitably spawn a series of irrationalities that limit, eventually compromise, and perhaps even undermine their rationality.” Therefore, while the commercial fishing industry has become more efficient, calculable, predictable, controllable, and able to yield higher harvests, it has also contributed to a condition where there is reduced or eliminated harvest potential. Conflict regarding fishing regulations is based on threats to identity and culture, the loss of income fishermen experience and the high level of debt due to their technological investments.

The limitations placed on harvest levels is a new phenomenon to many of those participating in the fishing industry. Seasoned fishermen talk of open-access and a time of few regulations (i.e., prior to the 1960’s). This open-access, unregulated past suited the rugged individualism which was pervasive in the fleet. The rationalization of the industry and the subsequent rise in harvest restrictions has meant that those participating in the industry will have more and more interaction with management agencies. Changing business conduct has been difficult for those individuals who fished, in part, for the opportunity to express and live out their individualism. Commercial fishermen’s independent culture did not foster the organization of groups or political activity. The rationalization of the fishing industry has resulted in new operational structures in the industry which are not readily accepted by fishermen coming from a culture that stresses individuality rather than bureaucratic formality. This offers some explanation why fishermen
have had difficulty in organizing and their lack of involvement in the decision making process.

Power and Control in the Decision Making Process

All of the themes have ties to the structure and function of the regulatory decision making process. Bureaucracy is another aspect of Weber's theory of rationalization which can be used to understand the themes of: the lack of representation and the frustration associated with the politics and bureaucracy of the regulatory decision making process. The theory of rationalization operates at the societal level. Embedded within the theory of rationalization is the theory of bureaucracy which can be appropriately applied at the institutional level. Bureaucracies emphasize the four components of rationalization: efficiency, predictability, calculability and a decreased level of human involvement resulting from the adoption of technology (Ritzer 1996:19). Weber used bureaucracy as a model of formal rationality which is a result of, "...the search by people for the optimum means to a given end [and] is shaped by rules, regulations and larger social structures" (Ritzer 1996: 18).

In order to understand the bureaucratic context of the decision making process, an overview of the organizational structure of a management agency is warranted. This overview will be based on the PFMC's structure, which is the management agency most often discussed in this investigation. (Although the PFMC is the agency reviewed, other natural resource management agencies are structured in a similar manner.) Following the brief description of the PFMC's structure, the theories of power and control and bureaucracy from Marx and Weber (respectively) will be discussed.
The most common agency model found in fisheries management is characterized as top-down, science-based and bureaucratic (McCay & Jentoff 1996:238). One useful analogy of this structure is that of a ladder with the rungs representing varying levels of authority, power and control in the decision making process (Figure 6). The most powerful positions are those with judgment power. The "top of the ladder" position gives the final "Yeah" or "Neigh" to the proposed regulations. In the case of the PFMC this top position is the Secretary of Commerce. Stepping down the ladder, are the positions which "appoint" those who are responsible for determining the course of action. The governors of the states represented in the PFMC appoint council members which serve as the "board of directors" of fisheries management regimes. The PFMC council members occupy the next rung. Council members are the decision makers and are in the position to determine what management options are the most appropriate. The next rung down the ladder are positions which advise and offer technical support for the council members. These positions are technical teams, advisory committees and occasionally ad hoc committees. The final rung on the ladder contains lobbying positions which vie for power by attempting to influence decision makers at the upper levels of the power structure (as indicated by the arrows in Figure 6, where the thicker arrows represent a higher level of lobbying effort). The lobbying groups which are most often represented and active in the PFMC decision making process are commercial fishermen, commercial fishing industry groups, environmental organizations and seafood processing interests.
Figure 6.

Power Structure Ladder of Management Agencies

High Level of Power and Control in the Decision Making Process

Final Judgment Power

Appointment Power

Decision Making Power

Advising & Technical Support Power

Lobbying Power

Low Level of Power and Control in the Decision Making Process
The regulatory decision making process is political and is structured in a hierarchical manner distributing power unevenly among the stakeholders. The regulatory management agencies are, "...institutionalized in rules, regulations and structures" which maintain the distribution of power and control (Ritzer 1996:19). Due to the structure, rules and regulations of the system, the various positions in the regulatory hierarchy are limited in the manner and amount of participation they have in the decision making process. The hierarchy of power, in part, determines the status of the position; thus, those high powered positions receive more status and respect than lower power positions. The theme which reflected the fishermen's perception that their involvement in the decision making process as only superficial reflects their power as lobbyists. Lobbyists participate in the decision making process by attempting to influence the decision makers rather than having control over the final decisions regarding fishing regulations.

Control of the Fisheries

Marxist theory explains social phenomena on the basis of people's relations to the means of production. Marx viewed the organization of work as the institution which is the driving force in society (Abrahamson 1990:58). A person's work determines their roles, relations, values and material conditions. Marxist theory is applied at the institutional level in order to bring about understanding of the themes regarding the lack of representation and the politics and bureaucracy found in the regulatory decision making process. Fishermen share many common material conditions: they are subject to fishery management regulations, they often live in communities which are, or historically have been, reliant on fishing for economic support, they share similar working conditions and schedules and have similar
lifestyles. Fisheries management agencies also share material conditions: they are organized in a hierarchical manner, they operate in a bureaucratic system, they control fishing regulations and management regimes and they value scientific knowledge. It is important to note that management agencies and commercial fishermen also share common material conditions and values including: participating in the same decision making process (although at different capacities) and valuing the continued exploitation of fishery resources.

Marx's theory is centered around the idea of class conflict, where differential class relations to the means of production result in conflict between the workers (proletariat) and the owners (bourgeoisie). In fisheries, the resource is often thought of as a commons with no group exercising ownership over it. However, there is much debate on this issue (as evident by discussions on the FISHFOLK internet newsgroup and in academic literature); and while perhaps there is not ownership of fishery resources in the terrestrial sense, the agencies act as gate keepers to the resource. Fisheries management agencies function on behalf of all citizens since ocean resources can not be "owned" in the same manner as cattle on a ranch. However, management agencies can function as the "owners" of fishery resources since they control access through regulations thus, they can be viewed as the bourgeoisie. Fishermen can be viewed as the workers in commercial fisheries since they do not own the means of production (i.e., have ultimate control over access to the resource) thus, they can be considered the proletariat.

The establishment of fisheries management agencies, in a sense, privatized the resource. When open-access fishing characterized the commercial fishing industry, the fishermen where functionally owners of the means of production. The fishery resources of the oceans (within the exclusive economic zone of 3 to 200 miles
offshore) became effectively private property when fishing regulations were established. The establishment of regulatory management agencies was, in part, due to a recognized need to sustain fishery resources for future harvest and ecological functions. Management agencies replaced the fishing industry as the owners of the resource and also broadened the interest base of the resource, by including other nonextractive values of the social constituency in the decision making process. Marx views the process of privatization as an element of alienation, "...a result of the movement of private property that we have obtained the concept of alienated labor (of alienated life) from political economy" (Farganis 1996:65). Fishermen have become distanced or alienated (to a degree) from the institutions which set the management regulations because fishermen are no longer in complete control over the means of production, rather, they now operate in a position of less power over the determination of fishing regulations. These two groups are in conflict since they have differing levels of power over the means of production (fishing regulations).

When fishermen express that they are disrespected and not adequately represented during the regulatory decision making process, they are expressing their unrest regarding their relationship to the means of production. The view that their involvement in the decision making process is superficial comes from their position of power in terms of their relationship to the means of production. The decline in control of the means of production which commercial fishermen have experienced and their position in the hierarchical structure of management agencies offers some explanation for the frustration regarding their involvement in the decision making process.
Bureaucratization

Applying Weber's theory of bureaucratization at the institutional level of analysis, (discussed on pg. 56) offers an explanation of why commercial fishermen feel frustrated when they attempt to participate in the decision making process. The procedures and politics embedded in the management institution make participating in the decision making process difficult for those with low levels of power and control over the means of production. Because the fishery resource management agencies operate under a rational-legal mode of legitimation and therefore are bureaucratized, commercial fishermen are required to go through specific, defined procedures when attempting to participate in the regulatory decision making process.

The fishery management agencies have risen in power and now "...direct and administer activities in... [fisheries] with increasingly rational views associated with modern industry and science" (Abrahamson 1990:107-8). When a fisherman attempts to become part of the decision making process they often experience obstacles in the form of policies and procedures which dictate how the management regulations are developed. The decision making process in fishery management agencies is directed by formal rules or management regulations (Abrahamson 1990:114). The relationship one holds to the means of production determines when, where and how they may participate in the process determining the fishing regulations.

Because the fishery management agencies are operating under rational-legal authority (i.e., are part of the governmental institution) they are characterized by strict rules and hierarchical arrangements which have a lawlike quality (Abrahamson, 1990:112). In order to effectively influence fishing regulations, fishermen must enter this organization and "play by its' rules" if they are to ensure their future participation in the fishing industry. Not only do individuals who lack
complete control over the means of production face limitations on how they are able to be involved in the decisions, they also encounter the use of power and control by others whose positions in the bureaucratic structure give them more political leverage.

The political alignments evident in fishery management agencies are a result of interest groups exerting their positions of power onto the regulatory decision making process (Golden, 1996). These positions of power have different material conditions which determine their influence. The most notable source of political power comes from the interest group's economic status. Groups with the financial means to lobby for fishing regulations which are in the favor of their interests are able to increase their power and control in the decision making process in several ways. Firstly, financial power can "buy" positions which operate at higher levels of power in the bureaucratic structure of the agency. This purchase can be done legally and illegally. For example, bribes to individuals with more power and control in the agency are an illegal form of financial power exertion; while hiring consultants such as private fishery biologists to conduct scientific investigations gives the interest group a voice which can operate at a position of higher power (i.e., the consultant can boost the group's position of power from a lobbyist position to a technical advisor position).

Secondly, a group's financial standing determines whether or not (or to what degree) they can afford to participate in the decision making process. For example, a large seafood corporation may have the ability to pay an employee to attend and testify at a PFMC meeting on behalf of the company's interest while a small owner-operator may not have financial means to take time off from their fishing activity to attend and testify at a meeting.
Finally, the financial means of an interest group affects their social status and legitimacy. The financial standing of an individual or group influences their legitimacy and position of authority in the eyes of others. For example, when the PFMC hears testimony from the CEO of a large fishing corporation or small independent fisherman, they also "hear" the characteristics which are ascribed to that individual based on their position (financial and social). The CEO may be viewed as an educated, astute businessman whose position comes from their ability to be a successful member of the fishing industry therefore, they must know what they are talking about. The small scale fisherman may be viewed as an uneducated, narrow minded individual who does not grasp the big picture or the issues that face the industry as a whole. The level of material resources one has is related to one's position of power and ability to function successfully in the bureaucratic structure of the regulatory process.

Other sources of power which operate in fishery management politics come from positions of authority and the relationships interest groups have with other groups and individuals holding various positions in the bureaucratic structure of the management agency. These relationships color the composition of the decision making body which is, "comprised of citizens appointed by the Governor. Appointment is largely based on political ties" (Weeks 1995:430). The credentials which a group member holds influences the level of authority granted to them by the decision makers. One's credentials are comprised of their leadership abilities, level of education, associations and reputations. The more creditability one has the more power they gain when participating in the decision making process. The alliances one has with other members of the industry and management agencies also affects their ability to effectively participate in the regulatory decision making process. The
saying "it's not what you know, but who you know" is supported by other research projects which found "... a core of key players from the fishing industry, universities and [management agencies] knew each other quite well...They formed a type of sub-community based on long association with each other, regulatory problems and the bay [environment] itself" (Weeks 1995:435). These relationships play out in the form of political alliances operating in the decision making process.

The Role of Knowledge as Power

The commercial fishing industry has experienced technological and cultural changes as revealed by the application of the theory of rationalization. These changes combined with the power, political and bureaucratic structures uncovered with the use of Marxist theory of power and control and Weber's bureaucratization theory, give a context to the analysis of the theme of competitive funds of knowledge. A materialist perspective is based on the belief that knowledge, values and paradigms are a result of people's material conditions and life experiences. The knowledge and beliefs one has reflects the material conditions of that person (i.e., college educated and life experiences). The analysis of competing funds of knowledge operates at the institutional level and employs the perspective that, "technology and/or economic conditions are considered the main determinants of both social organization and values" (Abrahamson 1990:172). Thus, people's perspectives change in response to changes in their material conditions which determines their relationship to the means of production and positions of power.

Commercial fishermen and fishery management agencies have two distinct cultures and ways in which they view the world. Fishermen see the world through their experience and have "big picture" understandings. They often refer to
themselves as "jacks of all trades and masters of none" which demonstrates their overall perspective of the industry rather than professing being an "expert" on a particular aspect of commercial fishing. Management agencies operate in a very defined environment which is structured by rules, policies and procedures. Those operating within the parameters of the management agencies are technically trained and are concerned with the details and specifics (variables) of fishery resources. Because these two groups operate in different environments and therefore have different knowledge bases and paradigms, they often conflict when they are in the same arena.

Since fishermen and fishery management agencies do not have the same relationship to the means of production and do not occupy the same power position in the bureaucratic structure of the regulatory institution, they do not share the same level of influence. Scientific knowledge is often favored over experiential knowledge in the regulatory decision making process for several reasons: 1) those with a high level of decision making power tend to come from scientific backgrounds and training, 2) society as a whole values science and believes it to be the objective truth and 3) the bureaucratic structure of the regulatory system is weighted towards science. Science has been seen as a vehicle which, "...may be used as a legitimating frame for policy decisions through the translation of social issues into technical ones...Such a translation is an appeal to objectivity in a contested and value laden domain" (Weeks 1995:429).

One way of viewing the competition between these two funds of knowledge is by framing fishermen's and management agencies' views of the world as two different lenses which focus on different aspects of the same phenomenon. A useful analogy is to think of the world of fishery resources as a puddle. The commercial fishermen's
perspective sheds light on one portion of that puddle, while the perspective of management agencies sheds light on a different portion of the puddle (Figure 7). The portion of the puddle which is illuminated represents the fund of knowledge particular to that beam of light, or the perspective of fishermen or fishery resource management agencies. The two perspectives will (in most cases) share a portion of puddle thus, some agreement or shared perspectives will be encountered with the unshared portions of the puddle being the focal points for debate and conflict.

Figure 7.

Puddles of Experience
The material conditions of these two groups form the lens through which they view the world. Since the material conditions of the commercial fishermen and fishery resource management agencies differ, they view the management of fisheries resources differently and therefore acquire different funds of knowledge.

The perspectives of commercial fishermen and fishery resource managers is also a product of their relationships to the means of production and their positions in the bureaucratic structure of the management agency; that is, understanding of fishery resources comes from experiences as the recipients or the makers of regulations. Their positions in the bureaucratic structure produce different vantage points. Thus, a lobbyist has a different vantage point or perspective than a person who is the final arbiter in the decision making process. The two competing funds of knowledge are produced in part by: the different positions held in the bureaucratic structure of the regulatory institution, the relationships commercial fishermen and management agencies have to the means of production, differences in their material conditions and their distinct cultural and ideological backgrounds.

Lack of Communication

The final themes: frustration keeping informed and poor communication, can be understood by the Marxist and bureaucratization theories previously discussed. Applied at the institutional level, these theories offer some explanation why there is a lack of good communication systems between the stakeholders.

The frustration and inability to keep abreast of the regulations demonstrates how the structure of the regulatory decision process and bureaucratic system keeps those positions with a high level of power and control over the means of production and those positions with less power and control over the means of production in a
steady state. Bureaucracy functions to maintain the power structure of the institution and maintain the relationships to the means of production as the status quo. Information regarding the decision making process and the resulting regulations is controlled by the rules and procedures of the bureaucratic structure. Thus, commercial fishermen learn about fishing regulations when the policies and protocols operating in the regulatory institution dictate. During times when information is not released from the agency or if the fishermen are not involved in the decision making process, they must seek it out or use other channels of communication. Both formal and informal channels of communication regarding fishing regulations were described as inadequate in this investigation. The question remains, why isn’t there effective direct communication between commercial fishermen and management agencies?

Social Integration

Another useful sociological concept for understanding the lack of good communication between commercial fishermen and management agencies is social integration. The concept of social "...integration involve[s] the strength of individuals' ties to society... [these ties] are a function of the stability and durability of social relationships" (Abrahamson 1990:160). This perspective is useful at many levels of analysis (i.e., societal, institutional, group, and individual), however, it is appropriate to apply this theory at the institutional level in the analysis of the theme of poor communication. Social integration is based on the notion that the maintenance of social relationships is due to people conforming to socially sanctioned expectations (Abrahamson, 1990:160). The commercial fishermen's relationships with fisheries management agencies determines their level of social integration. The socially sanctioned expectations refer to the bureaucratic rules and procedures which
are in operation in the regulatory decision making process and the resulting regulations. These rules, procedures and regulations govern the fishermen's activity in the decision making process and their fishing activities. Not following the rules, procedures and regulations is considered deviant behavior.

The stability and durability of the social relationship between commercial fishermen and management agencies is tenuous for several reasons. One reason for the delicate relationship is due to the instability and decline of many of the fisheries. The regulations associated with various fisheries change from season to season and even within a season in some cases. The instability of the regulations results in a low level of social integration between commercial fishermen and fishery management agencies because of the lack of dependability and consistency of the fishing regulations.

The instability of the relationship between fishermen and management agencies is mirrored in social relationships in other industries as our society shifts to the Post-Accord or Flexible Economy Era (Rubin 1996:26). The Accord era was characterized by a contract ("...the social contract...underpins society...[and is] the underlying shared social understandings that structure cooperation within a world of self-interested people possessing unequal resources" (Rubin 1996:4) between employers and employees which ensured a stable and secure relationship. The current Post-Accord era is characterized by the absence of a social contract between workers and employers, resulting in a lack of job security and long term, dependable relationships. The instability of the regulations creates a low level of social integration between the fishermen and management agencies because there are no long-term contracts governing the relationship between management agencies and fishermen. Because there is a low level of social integration, it is expected that commercial fishermen
and management agencies would be less likely to have strong, effective communication channels regarding fishing regulations. The absence of a social contract between fishermen and fishery management agencies offers an explanation for the lack of effective communication channels.

Examining the conflict over fishing regulations by filtering the themes through social theory has uncovered some of the underlying structures and functions contributing to the on-going disputes in fishery management. The bureaucratic structure of the decision making process and the uneven distribution of power and control resulting from political, social and economic sources are the foundations of the themes brought forth by this study. The cultural differences produced by the material conditions of the stakeholders also contributes to the conflict. Identifying the fundamental causes of the conflict is useful for efforts which attempt to lower the level of conflict and increase cooperation between the stakeholders.
Discussion

The overall purpose of this study was to: 1) provide a rich description of the fishing regulation conflicts between commercial fishermen and management agencies, 2) apply a sociological lens to the phenomenon and uncover the underlying structures and functions contributing to the conflict and 3) make recommendations which could decrease the level of conflict. The first two aspects of the study have been executed. However, before discussing the recommendations and implications of this study, the specific objectives of this investigation (discussed on pg. 34) are revisited. This investigation did address: the relationship between commercial fishermen and management agencies in terms of their communication and participation in the decision making process (objective 1); the impact of fishing regulations on the industry (objective 2) and the information systems regarding fishing regulations and their efficacy (objective 3). The themes which emerged from the field did not address how the source of fishing regulation information affects the behavior of the recipient (objective 4). Although the investigation did not meet all of the objectives it was successful as an exploratory investigation because it identified some of the central issues regarding commercial fishing regulation conflicts.

The conflict between commercial fishermen and fishery resource management agencies is undoubtedly complex and there are no simple answers for managing this conflict situation. The analysis of the themes uncovered some of the underlying structures and functions which contribute to this on-going conflict. In order to effectively manage the conflict, the fundamental structures and functions contributing to the conflict must be addressed.
The purpose of this discussion is to link the theoretical analysis of the conflict between commercial fishermen and management agencies, to the real world and offer some practical implications for the findings of this study. The framework used to connect the theoretical analysis back to "reality" is an interpretive approach. The interpretive approach used in this discussion utilizes grounded theory to make connections between the social phenomenon and established theoretical perspectives. The recommendations reviewed in the discussion come from the participants. The comments of the participants were categorized into thematic groups as directed by grounded theory. The suggestions were reviewed on the basis of two criteria: 1) the suggestion addresses the fundamental structures and functions contributing to the conflict as identified by the analysis and 2) the suggestion has support in the resource management literature. Thus, the data is ultimately connected to established theory, since the suggestions made by the participants of this study were found in natural resource management literature. The use of these two criteria, increases the potential for decreasing some of the conflict over fishing regulations because it can determine that the suggestion addresses the fundamental aspects of the conflict and is supported by other research as a potential aid in creating better management regimes. In order to provide background regarding fishery resource management approaches and conflict management styles, a brief review of the main schools of thought is provided, followed by a discussion on the practical implications for this investigation's findings.

The dominant resource management structure is top-down and science driven, and produces exocratic decision making processes where the decisions are made outside of those most affected by the decision (McCay & Jentoff 1996:239). The traditionally, dominant model of resource management decision making often includes
some form of public participation. This is true of the PFMC which holds public testimony periods during management meetings and includes written testimony in the information packets regarding the proposed regulation options. Despite this opportunity for involvement, one of the most often cited issues brought up in this field investigation was that the involvement of the fishing industry in the decision making process is superficial. Other research projects have also identified fishermen's perception of "a grossly unfair situation" regarding regulatory decision making processes (Davis & Bailey 1996; Smith & Jepson 1993). This schism between what is supposed to happen and what actually occurs is not unique to the PFMC,

Public participation theoretically provides a forum where the scientific information and values of the public and the agency can be integrated so that the decisions are viewed both as desirable and feasible by the broadest portions of society. In reality, public participation is often structured as an internal/external, us versus them, zero-sum conflict situation. In that context, strategies of both the agency and the publics more likely become competitive rather than collaborative, centered around the distributive allocation of a fairly fixed set of resources (Walker & Daniels 1996:80).

This traditional attempt to include the stakeholder's perspectives does not function as it is intended, so the question is, are there alternatives or changes which would remedy this disparity?

There are other approaches to management which are proposed and implemented in some instances. These "alternative" approaches to resource management and decision making processes include: arbitration, multiparty collaboration, cooperative management and adaptive management (Walker & Daniels 1996; Phyne 1996; Nugent, et al. 1996; Schramm & Hubert 1996). Arbitration is a conflict management technique which utilizes a third party that has control over the final decision, "An arbitrator is given authority to hear all sides...discuss it with each party, and then make the final decision...much like a judge in a legal case"
Multiparty collaboration also employs a third party who mediates and facilitates the negotiation process between the stakeholders, "...facilitated/mediated collaboration locates control and power in the parties and their negotiation relationship. Disputants participate jointly in the decision making process, maintaining ownership in agreements reached...this effort is often an ongoing process" (Walker & Daniels 1996:82).

Cooperative management is characterized by an endocratic decision making process where power is shared between the stakeholders and government with respect to the negotiation, definition and implementation of management plans within a legal framework (McCay & Jentoff 1996; Davis & Bailey 1996). "The basic principle of co-management is the devolution of regulatory authority to fishers' organizations. Another aspect is the systematic and formally organized collaboration between user groups and government agencies...the institutional design of co-management may take many forms" (Jentoft & Sanderson 1996:296). Adaptive management is an approach which has a long-term perspective on the resource and natural environment and is flexible so that the plan can be refined to fit the changing conditions. Initial management strategies must be based on the best available information and contain within them the intent to carry them out over an appropriate period of time. Using adaptive management, information is gathered throughout the implementation plan regarding ecosystem responses to specific initiatives. This information is then used to modify practices as appropriate" (Nugent et al. 1996:321). These management and decision making approaches have been implemented in different forms, with different natural resources throughout the world, with varying levels of success.

The question to be considered is, should the current regulatory decision making process, which was found to be a central part of the conflict between fishermen and
management agencies, be altered or should it remain the same? From a social justice perspective, (which advocates equal consideration, representation and rights for all people regardless of the socioeconomic, gender, cultural or lifestyle characteristics they may have), the argument can be made that the current process should be altered because the current system functions with an unequal distribution of power and control. "It would be simplistic and irresponsible to ignore the implications for social justice within local coastal community social structures of management proposals that may accomplish little more than the further entrenchment of relations of exploitive appropriation, ascriptive exclusion and class relations" (Davis & Bailey 1996:260).

By ensuring that all perspectives, ideologies and interests are present and considered during the decision making process, the stakeholders will gain ownership in the management regimes and feel an increased level of control over the means of production. This sharing of power and control can help decrease the level of conflict over fishing regulations primarily because it addresses the underlying structures and functions that emerged from this investigation.

Distributing decision making power and control more equitably is good in theory, but in reality this may not be easily achievable or even feasible. One of the obstacles in altering the fishery management decision making processes is that the current system is founded in law (i.e., the Stevenson - Magnuson Fishery Conservation and Management Act 1997 - originally passed in 1976), policies and mandates. Not only are management agencies legally founded but they are reinforced by bureaucracy which makes altering the system incredibly difficult. Because of these obstacles the implementation of the proposed changes may be best suited to occur within the current system. Thus, we do not need to reinvent the wheel, instead we can look for leverage
points where changes could be made within the current system to bring about a more equitable distribution of power and control.

The recommendations which are reviewed below are placed in context by linking them to the natural resource management literature and address the fundamental structures and functions which contribute to the conflict. These proposed changes are the participant's answers to the question, "what can be done to better the situation?" The proposed changes include: restructuring the decision making process and council, involving fishermen in all aspects of the decision making process and the scientific data collection, improving the level and effectiveness of communication between fishermen and management agencies and using a holistic or ecosystem approach to fishery management.

Restructuring the Process / Council

Many participants suggested that there is a need to restructure the Pacific Fishery Management Council. The proposed restructuring is a response to political processes and lack of industry (and other interest groups) representation currently exhibited in the structure and function of the decision making process. Changing some of the qualification criteria in order to achieve a representative cross section of the industry was offered as one way to bring about a more balanced distribution of power,

_How about having equal representation for all of those involved in the industry, how about increasing the number of commercial fishermen on the council_ (Winchester Bay fisherman).

_It should be a requirement of management and biologists to spend 2-3 years in the industry (fishing/processing) because the fish don't act like the models_ (Garibaldi shrimper).
There needs to be more small boat owner interests on the council (Astoria fishing family member).

There is a lack of leadership in the council and people are representing their individual agendas rather than the whole this is further compounded by the committee being stacked with salmon interests which don't have an understanding of the other fisheries they are managing like the groundfish (PFMC council member).

These comments focus on issues of equal representation and involvement of all of the stakeholders. This is one of the proponents of co-management regimes, which, "... embody a fundamental sense of social justice and fairness. The embedded notion of justice expressed is referenced by the idea that humans have an essential right to be full participants in the management of matters affecting their lives and livelihoods" (Davis & Bailey 1996:262). As full participants, the stakeholders involved in co-management gain procedural justice. Procedural justice promotes fairness in the mechanisms, structures and functions which lead to the distribution of resources (Perusse Daigle, et al. 1996:18). The opportunity to truly be a partner in the decision making process carries the potential to decrease the level of conflict between fishermen and management agencies because the traditionally, marginalized stakeholders gain ownership in the resulting regulation. "Fairness is perceived to be greater when the opportunity to voice one's concerns is combined with the possibility of influencing the decision...this increases satisfaction with decision makers" (Perusse Daigle, et al. 1996:19). Co-management regimes which are sensitive to procedural justice have the aptitude to decrease the level of conflict over fishing regulations due to the increased representation and voice of the stakeholders.
Involving the fishermen in the science of management was suggested more often by commercial fishermen but was also commented on by management personnel. The idea of getting the stakeholders cooperating in the acquisition of knowledge addresses the issue that the conflict between these two groups is in part due to the competition between experiential and scientific knowledge. Having cooperative research programs gives the commercial fishermen, biological researchers and management agencies a shared knowledge base. The sharing of knowledge has the potential to increase the understanding of one another’s perspectives and foster better communication between the stakeholders because they will have a cooperative working relationship in addition to a management-user relationship,

We need the fishermen’s information but have to have trust and confidence both ways for this to work. We need to improve our fishery data base and our relationship with fishermen (PFMC Council member).

Fishermen can qualify the trends which they observe (not giving specific biomass for a stock assessment) but they can offer support (Industry leader).

We should be working on getting industry and GAP individuals involved in the stock assessment by doing collaborative projects (PFMC committee member).

We [the seafood processing industry] are willing to work with the agencies with data collection (Industry leader).

I have really enjoyed the working with researchers on my vessel. Both sides have learned a lot about the resource (Garibaldi fisherman).

These comments indicate that there is interest from both management personnel and commercial fishermen in conducting cooperative research projects.
There has been much research on the use of indigenous or experiential data in agriculture and natural resource management (DeWalt 1994; Waterman 1997; Weeks 1995; Nugent, et al. 1996). This suggestion of cooperative research is in line with the philosophy of co-management. "It is important that we see indigenous knowledge systems and scientific knowledge systems as complementary sources of wisdom...we need to try to achieve the holistic understandings that are characteristic of indigenous knowledge systems [and] ... combine [these systems] with the experimental methods of scientists" (DeWalt 1994:127). One example of the use of experiential data has been in studies for the New England groundfish stocks, "...this project...combined the information from the fishermen with bathymetric and other oceanographic information to help validate the identified spawning areas" (Waterman 1997: 21). Working cooperatively has the benefit of establishing better communication between fishermen and management personnel. Working together these groups must use terminology which is understandable to each other and yet conveys the complex, technical information in manner which doesn't "dumb it down" or lose the content. It was found that when scientists and fishermen had communicative relationships the language barrier was broken down, "[fishermen] gained a rationalized language to describe their own observations...they learned that criticizing scientific method... by claiming faulty research design... [made it] easier to argue [against]" (Weeks 1995: 433). Working together establishes relationships and dialog and thus, facilitates the functioning of co-management regimes.

Better Communication

There were many suggestions made by respondents regarding the communication systems and their effectiveness when asked the question, "what
should we do to make it better?" There was quite a bit of commentary that the communication needs to be improved but there was little advice on how or what improvements may be desirable and feasible,

We need better communication through all aspects of the process and with all of the people involved. We need to work together. Fishermen need to be more cohesive and work together (Garibaldi fisherman).

Fishermen feel apathetic about getting involved in management and politics but we need to start a dialog (Garibaldi Fisherman).

The current communication system is clumsy and has some weak links so even though the information eventually gets to the fleet it is not always done in a timely manner especially on small ticket items (ODF&W fishery biologist).

Industry, science and management need continued conversations (Newport Fisherman).

Other research has also pointed for the need to have more effective, timely, trusting communication between management and fishermen. The need for communication which involves intersubjective understanding and coordinated actions in cooperative, adaptive management strategies is a fundamental aspect which will determine the success of the management (McCay & Jentoft 1996:246). Establishing better communication systems could take many forms including: written, oral, electronic, through formal and informal networks or individuals. Participants of one study suggested that face-to-face interaction may be one way to establish trust and communication between fishermen and management agencies: "Fishing Families suggest that increased contact between commercial fishers and policymakers is a key to improving understanding" (Smith & Jepson 1993:48). Effective communication not only holds the promise of decreasing the level of conflict but also increasing the
potential for a shift to an ecosystem management approach, "When ecosystem
management philosophy is adopted by an agency's administration, managers and
field staff must understand the philosophy, how to implement it, and - most
importantly - how to communicate it to the public" (Schramm & Hubert 1996:9).

There has also been research on the role and effectiveness of a third party
mediator/facilitator in natural resource disputes. The use of a mediator/facilitator
helps parties maintain a constructive dialog and arrive at a mutually agreeable
decision in a manner which, "encourage[s] direct communication between the
disputants" (Walker & Daniels 1996:81). There is no single recipe for improving
communication, and good communication may take different forms depending on the
circumstances of the populations which are involved; however, it is clear that there
is a demand for better communication and also some willingness to work towards it.

Changing the Management Perspective

Another suggestion which was commonly raised during discussions with
fishermen and management personnel was to adopt a new perspective in management.
It was suggested that the traditional paradigm needed to be replaced by a
management perspective which was holistic, adaptable and long-term. The current
perspective was criticized because it did not take into account the cumulative impacts
and interactions of all of the species specific regulations. The operating paradigm
was also criticized for its' short term view of the resources and lack of understanding
of the ecosystem(s) of the species being managed,

>You need to look at the big picture, focus should be on
global circulation changes not just upwelling
(Brookings fisherman).
The council needs to understand and take into account the entire ecosystem. They need to understand that when bycatch is discarded it increases the sand flea production which decreases suitable spawning habitat which in turn limits next year's stock (Winchester Bay fisherman).

The life cycle of salmon is perfectly orchestrated, carcasses of the spawned adults nourish the eggs, provide nutrients for the stream which support the aquatic food chain for the fry which emerge in the spring. The cycles and systems need to be incorporated into management (Newport fisherman).

The council needs long-term strategic planning and thinking, right now we are in a crisis management situation and the fundamental problems aren’t adequately addressed due to the continuing crisis management (PFMC council member).

The proposed shifting of the current management paradigm to one which is based on a long-term perspective of ecological systems was echoed at an American Fisheries Society symposium in 1995 (Schramm & Hubert 1996). Participants of the symposium included: university researchers, biologists and managers from various land management and regulatory agencies; and despite some criticisms and the varied interpretations on the approach, there was agreement that, "...maintaining healthy ecosystems, ecological integrity, biological diversity, and sustainability will require...[ecosystem management's] philosophy as a necessary and functional change in resource management" (Schramm & Hubert 1996:8).

The literature on ecosystem management does not limit the variables to those operating in the natural, physical environment rather, definitions of ecosystem management often encompass social, political and ethical considerations as well. The broad array of considerations encompassed in many of the ecosystem management definitions makes this management approach conducive to being blended with adaptive and co-management approaches. A land management employee noted that,
"It will be necessary to involve a broader array of disciplines and areas of expertise in formulating our policies and management plans, and to find productive ways to ensure better and more meaningful ways for more public participation in our efforts" (Schramm & Hubert 1996:9). Ecosystem management is a natural evolutionary step as the science of natural resource management progresses. Furthermore, the coupling of co-management with ecosystem management will help address the ecological integrity, resource depletion, commodity production, biological conservation, socioeconomic and ethical issues which contribute to the complexity of natural resource management conflicts.

The proposed changes of: restructuring the decision making process and council, using a holistic or ecosystem approach to fishery management, involving fishermen in all aspects of the decision making process and the scientific data collection and improving communication between fishermen and management agencies all address the bureaucratic structure and the use of power and control in the decision making process. The policies and proposed management regimes for the salmon of the Pacific Northwest are indications that ecosystem management and cooperative and adaptive approaches will be implemented in greater numbers in the future. These management approaches will need to be evaluated not only on their ecological and biological successes, but the social justice which they provide.
Conclusion

The purpose of this study was to further understanding of fishing regulation conflicts and to identify leverage points which could be altered to produce a decreased level of conflict and increase cooperation between the stakeholders. By providing a rich description of the conflict between commercial fishermen and fishery resource management agencies to which sociological theories of rationalization, power and control, bureaucratization and social change could be applied, the underlying structures and functions of the conflict were revealed. The bureaucratic structure of the decision making process and the politics and power structure operating in the process were identified as key forces contributing to the conflict. Changes which address these structures and functions are thought to help alleviate the level of conflict. Altering the way in which stakeholders are involved in the decision making process in a manner which redistributes power and control over the means of production was proposed as one way to address the conflict. Research on natural resource management indicates that co-management, participatory decision making processes, adaptive management and ecosystem management are approaches which attempt to effectively redistribute power and control equitably.

As these alternative management and decision making approaches are employed, it will be important to evaluate their ability to maintain biological diversity, environmental system functions and socioeconomic well-being. The use of socioeconomic and environmental factors as criteria for determining the success of a management regime, calls for communication and cooperative, interdisciplinary research projects by biological and social scientists, management and regulatory agencies, industry, the general public, environmental organizations and other interest
groups. Continual monitoring of the social and environmental criteria will be needed as these approaches are implemented in order to bring about social and environmental health.
Bibliography


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Appendices
Interview Protocol for Commercial Fishermen

1) Marine fisheries regulations have had a ___ effect on your ability to make a living from commercial fishing.

   A) very negative   B) no effect   C) very positive

2) Have recent fishing regulations (i.e. seasons, limited entry provisions, gear restrictions, quotas etc.) affected your fishing activity?

3) How have regulations affected you? -- economically, leaving the fishery, changing fisheries etc.

4) In what fisheries did you experience changes in regulations?

5) Were these regulation changes expected?

6) How do you learn of changes in fishing regulations?

7) What are your sources of regulation / management information? (i.e. fishing organizations, management agencies, council meetings / hearings, port councils, news letters, extension services, grapevine etc.)

8) Are some sources of information better than others?

   Why? (i.e. more accurate, time of learning proposed changes vs. imposed changes etc.)

9) Do you belong to any fishing organizations? Do you sit on any advisory committees, boards, hold an office in an organization or another leadership position?

   What one(s)?

10) What actions (if any) have you taken to influence fishery management regulations? (write a letter, give testimony, phone or speak in person to an agency representative etc.)
11) What (re)actions have you taken due to information received regarding regulation changes?

12) Do your (re)actions vary according to the source of the information?

13) People have given the following statements about fisheries conflicts
   1) Conflict could be avoided
   2) Conflict is inevitable but promotes necessary change
   3) Conflict is inevitable and prevents changes
   4) Conflict is inevitable but can be resolved
   5) Conflict can never be resolved, only managed

   which statement do you think is most appropriate _____
   which statement do you think is least appropriate ______

14) What changes would you like to see regarding regulation / management information and communication systems?

15) How long have you been involved in the fishing industry?

16) Do you support a family?

17) Do you own a fishing vessel? How large is it? What type?

18) How large is the fishing vessel you work on? What type of fishing vessel do you work on?

19) What fisheries do you participate in?

20) What ports do you fish from?
Interview Protocol for Management Personnel

1. On a scale of 1 to 5 (where 1 = very negative effect, 3 = no effect and 5 = very positive effect), how do you see fishing regulations impacting commercial fishermen’s ability to make a living from fishing?

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2. How do you inform commercial fishermen of fishing regulation changes? Please describe.

3. Do you involve commercial fishermen in the regulation decision making process?

   yes______ no______

   if yes, how and when?

4. People have given the following statements about fisheries conflicts.

   1) Conflict could be avoided
   2) Conflict is inevitable, but promotes necessary changes
   3) Conflict is inevitable and prevents change
   4) Conflict is inevitable but can be resolved
   5) Conflict can never be resolved, only managed

   which statement do you see as most appropriate? ____ least appropriate?____

5. What are the strengths and weaknesses of the current regulatory decision making process?

6. Is the fleet adequately informed of regulations? (timelines, accuracy etc.)

7. What changes (if any) would you like to see regarding how information on fishing regulation changes is disseminated?