Using the IDA Framework to Examine the Relationship Between Regulating Enforcers and the Commercial Trawl Fishery of Newport, Oregon

by

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Abstract

This research uses the Institutional Development Analysis (IDA) framework to examine the relationships between the individual levels of enforcement and the commercial trawl fishermen in Newport, Oregon, to determine if there is a difference in relationships and whether those differences impact compliance. While a difference in the relationships between the varied levels of enforcement and the fishermen was noted, this difference did not constitute a shift in compliance. Compliance remained high at all levels of enforcement. The real difference in relationships between enforcement and the trawl fishermen was found to be within the make-up of the fleet and it is responsible for a variety of outcomes that have the potential to impact not only the fishery, but the Newport community, as a whole.

Introduction

Newport is a coastal community located in Lincoln County, Oregon. Newport is also known as a fishing community (Conway and Gilden, 202; Package and Conway, 2010; NOAA, 2007). The economic structure of the community is somewhat diversified, but the community still has a relative dependency on fishing. One of the biggest factors influencing fishing practices are regulations. Regulations are designed to protect natural resources for use today and into the future. An often conflicting but necessary goal of fisheries management is to balance the protection of the resource with the protection of the people dependent on the resource (Wallace, et al). One of the prominent gear groups in the community is the trawl fleet. The trawl industry is facing a high level of regulation, which has been applied in a relatively short period of time, and a poor public image.

Compliance with natural resource regulation is an area with continual need for improvement. Both the enforcement community and the commercial fishing community complain and speculate on the causes of problems with compliance. This research focused on how the relationship between regulation enforcers and commercial trawl fishermen might impact compliance. Communication has the ability to impact the relationship between and within groups of people in both positive and negative ways. This research consisted of a series of interviews conducted with both commercial trawl fishermen and the regulation enforcers in order to examine what impact communication has on compliance, especially the number and level of infractions incurred by fishermen.

Commercial fishermen rely on information to effectively run their business (Conway and Gilden, 2002). If fishermen do not receive the necessary information to run their business effectively and legally, the price of doing business increases in the form of fines and penalties.

When fishermen incur these unexpected expenses they may be forced out of business, which has the potential to create economic instability in the community. A ripple effect can be felt throughout the community when fishermen are eliminated; bait shops, boat shops, canneries, processors, net shops, fuel stations, and many others are impacted (Conway and Gilden, 2002). These extra costs may be passed on to the consumer in the form of higher prices for seafood.

One complication in the communication process is that fishing practices are regulated by multiple agencies depending on which fisheries and the specific activity of the fishery. The agency responsible for regulating specific fisheries and the subsequent enforcement agency, depend on the species being fished and its habitat location. For example, "near shore" fisheries are fish harvested in state waters (defined by zero to three nautical miles off shore) and this is regulated by Oregon Department of Fish and Wildlife (ODFW). The enforcement arm of the State is the Oregon State police (OSP). Federal waters, on the other hand, are defined as the area between 3 and 200 nautical miles (Government, 2009; NOAA, 2010; Conway and Gilden, 2002).

However, there are exceptions. For example, federal regulatory agencies also regulate and enforce the groundfish fishery, which are typically harvested in state waters (Opsommer and Conway, 2005). The federal agency responsible for regulation is National Marine Fisheries Service (NMFS). NMFS also regulates migratory species such as salmon and tuna, regardless of where they are harvested. The enforcement arm for federal regulation is the United States Coast Guard (USCG).

The following table displays the agency responsible for fishery regulation and the associated agency responsible for enforcing the regulation:

Table 1. Relationship between regulating agencies and enforcement agencies.

	NMFS	ODFW	USCG	OSP	NOAA
Federal Fishing Regulations (Policy Development)	X				
State Fishing Regulations (Policy Development)		X			
State/Federal Safety Regulations (Policy Development)			X		
Federal Fishing (Regulations Enforcement)			X	X	X
State Fishing (Regulation Enforcement)				X	
State/Federal Fishing Safety (Policy Development & Regulation Enforcement)			X		

State and federal fisheries regulation enforcers communicate in different ways. The varied communication practices create confusion and misinformation within the fishing community (Conway and Gilden, 2002; Opsommer and Conway, 2005). Fishermen have been noted as saying they don't like working with fishery managers, because they feel devalued and unimportant in the process of fisheries management (Conway and Gilden, 2002; Package and Conway, 2010). The regulatory agencies enforce regulations differently and impose different repercussion for similar infractions. The state regulators answer to the federal regulators when designing state rules. State regulations must meet the minimum federal requirement, but can be more stringent in its regulations. State regulators submit their plan to the federal level that has the power to approve or ask for amendments (Government, 2009; NOAA, Investigations and Protocols, 2010).

Fishermen are divided within the industry and this effects communication. Fishing is known as an independent way of life (Package and Conway, 2010). Managers have been noted as saying they are uncomfortable working with the group, due to the intimidating nature of their communication style (Conway and Gilden, 2002). Depending on what species a fishermen is fishing for determines his main interest. Because the rules and regulations are difficult and complex, the majority of fishermen only get involved with ocean issues directly related to them or when the fisheries are in crisis (Conway and Gilden, 2002).

Regulations enforcers use a variety of strategies to communicate information to the fishermen. However, as Conway and Gilden (2002) reveal, many of these enforcers have difficulty in reaching portions of the fleet. This is for a variety of reasons. Outreach efforts are hindered by not having contact information for all of the fishermen (Conway and Gilden, 2002). There is no central registry for deck hands or other hired crew members. There is a disconnection with some crew members and the industry's culture. Some crew members are "just doing their job and simply collecting a paycheck, not looking to make a career out of fishing"; those that do want to make a career out it become skippers or boat owners and seek out opportunities to be involved in management development (Package and Conway, 2010). However, when crew members do want to be involved, the boat owner must choose between, an informed crew or a working crew (Conway and Gilden, 2002). Because word of mouth is the primary means for disseminating information among this population it is entirely up to an owner or captain if he even tells his crew what is happening (Conway and Gilden, 2002; Opsommer and Conway, 2005).

Informal networks have proven to be most effective in developing and maintaining relationships with the fishing community. Meeting at local fishermen hang outs can prove to be

beneficial for both fishermen and regulators (Conway and Gilden, 2002; Package and Conway, 2010). While there is a sense of independence that comes with the fishing lifestyle, there is also a sense of isolation. Proximity to management meetings determines who will be given the chance to participate. Often fishermen who do want to be involved in the policy process have to make a decision between being involved or fishing (Package and Conway, 2010). Fishing is not a typical, predictable job; if the weather is good, you go fishing, and not to a meeting.

Although other studies have investigated regulation compliance, no study has investigated the relationship between regulation enforcers and the trawl fishermen in determining the level of compliance. This research is important because it sought to fill a significant gap in the research on the impact of relationships between natural resource regulation enforcers and those they regulate. In addition to seeking observational differences in relationships, this study investigated concerns of livelihood impact expressed by participants. Both communities showed strong support for this research.

Literature Review

Institutional Development Analysis Framework

The IDA framework was used to analyze "how institutions affect the incentives confronting individuals and their resulting behavior" (Ostrom, 2007, p. 21). The term institution can be ambiguous, but as defined for this research institution refers to the structure of a group that promotes social order and cooperative decision making of the individuals within group. It has been long believed that common property will inevitably be over-exploited, as the lessons of the 'Tragedy of the Commons' has revealed. When no one owns the resource everyone will use the resource to maximize their own benefit, but when institutions are in place that basically

establish group ownership of the resource social norms can develop that protect the resource for all users. Avoiding over-exploitation is achieved through the collective choice of those that make up the institution. Agreements, understandings and constraints are established by the group repeatedly interacting. The interactions are similar to game theory, in that each player will make the choice that benefits themselves. However, if cooperation within the group increases the benefits for the group as a whole, individual's actions are incentivized to go beyond the instantaneous self-benefit and act in a way that benefits the group as a whole, mainly because they will interface with other users within the group and have to be accountable to the group for their individual choices.

There are two separate aspects of the framework. The first aspect of the framework consists of the three tiers where decision making is occurring and reveals the relationship among those tiers. The first tier is the constitutional situation; ground rules are established and those that will be involved in decision making are determined at this level. The next tier is the collective choice situation, which is where policy is actually formulated. The final tier is the operational situation, which is where the implementation of the policy occurs. These tiers act as building blocks, where each level builds on the previous level (Ostrom, 2007). This research focused on the top tier (the third / implementation tier) of the decision making process. However, both of the foundational tiers will be addressed in the development of the trawl industry in order to set the stage for current implementation.

The second aspect of the framework magnifies the policy development tier being used (in this case the operational tier) to examine the specific interactions occurring within that tier and predict potential outcomes. This portion of the framework works like a funnel. The physical material conditions of the community, the structure of the groups being examined, and the

culture of those groups are examined and defined; this represents the opening of the funnel. The funnel narrows in the action arena portion of the framework and allows for specific types of communication, interactions, and relationships between the groups and within the groups to be discerned. The final product produces patterns that reveal potential outcomes to be predicted (Ostrom, 2007). The following illustration depicts the idea of a funnel in understanding the necessary elements that go into determining outcomes under an IDA framework.

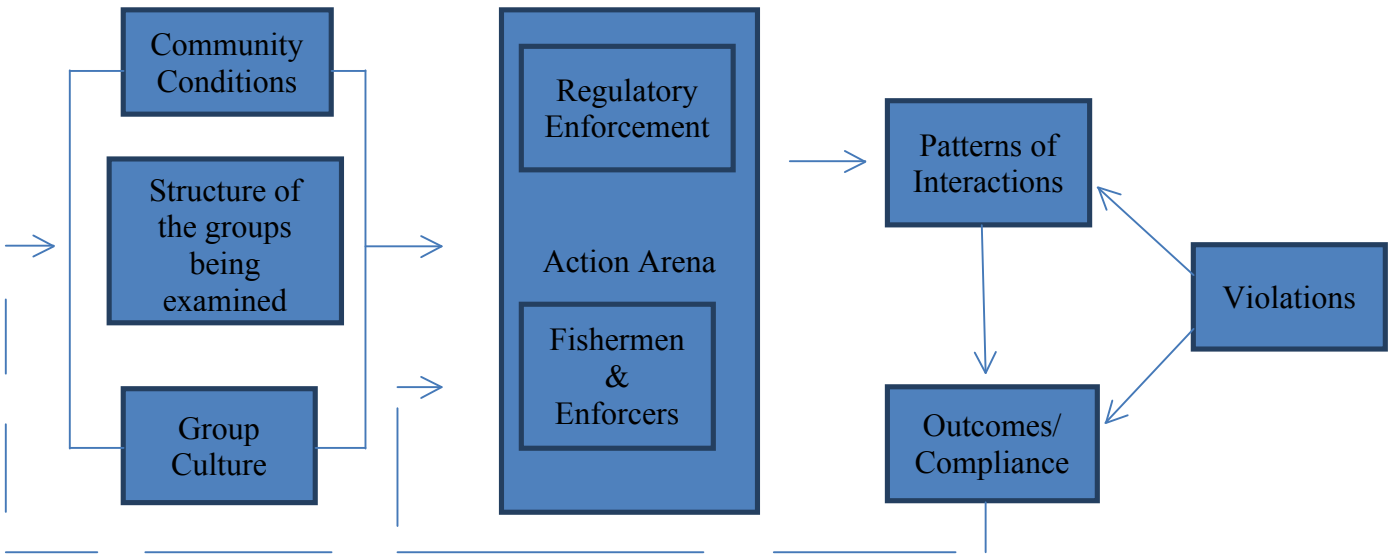


Figure 1 A Framework for Institutional Analysis
Source: Adapted from E. Ostrom, Gardner, and Walker (1994, p. 37)

The necessary components for this aspect of the analysis will be covered in the discussion and reviewed in the conclusion. The components consist of: 1) defining the participant and their position; 2) the potential outcomes that exist; 3) the linkages between actions and outcome; 4) the amount of control participants' exercise; 5) the available information and; 6) the cost and benefits associated with those outcomes (Ostrom, 2007).

This research followed the IDA framework by investigating the current conditions of the Newport, Oregon fishing community structure, various enforcement agencies' structure, fishing

culture, agency culture, interactions between fishermen, interactions between agency members, and interactions between the two groups to assess potential outcomes including compliance. But first, in order to gain a better understanding of the current conditions of the community and the fishing structure, it is essential to have an understanding of how the trawl industry has developed and lead to the current management system where decision making is occurring.

Development of the Trawl Industry

The development of the trawl industry plays a major role in the current state of the fishery, as well as dictates the types of interactions occurring today. Before 1976, trawl fishing was "open access" and dominated by foreign fleets. American fishermen did not have the infrastructure to compete or the market to motivate the development of the fishery. It wasn't until the Magnuson-Steven Act of 1976 claimed the waters from 3 nautical miles to 200 nautical miles off the coast, as an exclusive economic zones (EEZ), essentially closing the commons and created a "commodity" of the resources. American fishermen became efficient as trawlers, as the technology, infrastructure and fleet grew. Initially the government's goal was to develop the fishery and regulations were minimal, relying on local communities to manage the common pool resource. Government aid and support were used to build it into an economic industry to benefit the nation (Mansfield, 2010; Hanna, 200: Package and Conway, 2010).

The few regulations that existed were there to benefit the development of an American industry, one of which consisted of optimal yield. Optimal yield was defined as being the amount that the American fishermen could catch. By not quantifying this amount the fishery was allowed to grow, which was the goal and became the social norm under which fisherman operated (Mansfield, 2010). The fleet continued to grow. Two decades after the initial phase of the

development of the industry, the fleet was large, stocks were declining and science began to inform management decisions, the optimal yield became a quantifiable number known as the maximum sustainable yield (Mansfield, 2010; St. Martin, 2001), which still held the capitalization of the resource to be of the greatest importance. It was at this point that failures within the market began to emerge and the need for governmental intervention became evident. The first trimming of the fleet was determined necessary to further capitalize on the resource.

Management responded by assigning property rights through the implementation of a "limited entry" permit program, based on historical catch. This meant that a number was set and all the vessels that had landed at least that amount were given a permit and those that fished under the amount were not. The value of landing high volumes of fish in the past gave fishermen a right to continue to fish, whereas vessels with lower levels of catch and smaller impacts on the stock were excluded from fishing. By reducing the number of vessels in the fishery, those that remained would be able to make more money (Mansfield, 2010; Package and Conway, 2010), while minimizing or maintain the current impact on the stock. However, this reduction of the fleet proved insufficient in both its ability to provide profit for those that were permitted in the fishery and the ability to maintain the fishery long-term due to the overcapitalization of the trawl industry and its impact on the stock.

A further reduction was required, which led to the second trimming of fleet, in the form of a fleet funded, federal buy-back program (Hanna, 2000; Package and Conway, 2010; NOAA, Press Release 2000-R103, 2000). This action reduced the number of vessels fishing by offering permit holders the opportunity to sell their permits and or vessels and basically decommission them from the ability to ever fish again, which would leave greater opportunity for profit maximization for those left in the industry. Many fishermen staying true to the social norms

established, sold their vessel and bought a bigger, newer vessel to fish their permit. However, some did opt out of the fishery and ultimately the program was successful in reducing the size of the fleet. The majority of vessels that were eliminated from the fleet were the middle sized vessels. The buy-back left behind the largest most efficient vessels and the small family owned vessels (Package and Conway, 2010).

The development of the trawl industry was a capitalistic venture. It was anticipated that it would be able to work out conflict through the free market. It essentially closed the commons and allowed for the accumulation of wealth to be concentrated. This was the necessary economic driver in altering the fishery into a national resource capable of providing employment but failed to be an adequate solution for the issues facing the fishery and the community dependent on it today (Robbins, et al, Political Economy, 2010; St Martin, 2001; Mansfield, 2004; Acheson, 1981).

A more recent management approach, known as Individual Transferable Quotas (ITQ), is essentially the third trimming of the fleet. It has the potential to create a profitable, efficient groundfish fishery that attempts to protect both the resource while allowing for the utilization of the resource. However, it also has the potential to eliminate the small family owned vessels and impact fishing community in undetermined ways.

ITQs are the latest attempt by the government to intervene where the market has failed. It attempts to manage the resource from an ecosystem-based management approach. The Pacific Fishery Management Council's (PFMC) final environmental impact statement describes the objective of the trawl rationalization (also known as the ITQ system), as follows:

> *"Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and*

> *achieves individual accountability of catch and bycatch."* (PFMC & NMFS, 2010b., 2010)

When the ITQ system is viewed at the constitutional level, limited entry and the buy-back set the stage for which stakeholders would participate in the development of the trawl rationalization. Those that were included had a direct stake in groundfish. Captains, crew, and fishermen of other fisheries were not initially included in the rationalization (PFMC, 2004) even though all trawl fisheries are managed through the groundfish regulations (due to the potential to catch groundfish). Limiting stakeholders to those with direct groundfish interest created issues of inequality within the fleet. Furthermore, large trawl vessels that participate in distant water fishing had an advantage over the small family owned vessel, because they had fished under an ITQ system in Alaska and knew what to advocate for, to benefit their own interest in the collective choice stage of the rationalization process.

At the collective choice tier an attempt to address potential problems was made through the implementation of a moratorium on vessels selling their quotas for the first two years of the program (PFMC and NMFS, 2010a., 2010; PFMC and NMFS, 2010b., 2010). During the first two years only percentages of the poundage of a quota can be transferred. Newport is approaching the end of that two year period of time and the true impact of the ability to transfer quotas is yet to be realized. ITQs have the potential to incentivize smaller vessels to lease their quotas to the larger more efficient vessels and, in the process, limit the opportunity for fishermen to participate in the fishery. This would further consolidate the fleet and concentrate the wealth into fewer hands (Hanna, 2000; Package and Conway, 2010; Robbins, et al, Political Economy, 2010). In order to address the potential consolidation of the fleet, a maximum quota amount has been set (PFMC and NMFS, 2010a., 2010; PFMC and NMFS, 2010b., 2010), but loop holes may exist. For example, the ability to develop many separate corporations under one owner may

allow for few to possess the majority of quota, leaving the effectiveness of this protection to be determined.

Community Conditions

Newport relies on fishing for economic stability. The industry brought in over 30 million dollars to the area in 2010 from fish landings (Van Voorhees, 2010). However, the community has a higher rate of dependency than that of just relying on income brought into the community from fishing alone. There are all the fishing related businesses that are impacted by what is going on in the fishing industry as well (Package and Conway, 2010). Businesses such as bait shops, marine stores, net shops, boat yards and many others when considered as a cluster is reported to give Newport a 6.7% dependency on the fishing industry (Watson and Beleiciks, 2010; Houston, et al, 2000; Package and Conway, 2010). While fishing may no longer be a major economic contributor for the state or even Lincoln County, it still remains an important sector for Newport's economy. Even though Newport is the largest port on the west coast in terms of revenue generated from fish landings, its economy is diversified. Newport has a 31% dependency on tourism. However, fishing and tourism have been linked (Watson and Beleiciks, 2010; Package and Conway, 2010). In addition, because of the infrastructure that exists due to commercial fishing, many people are attracted to the area for sport fishing and this brings revenue to the community in the form of tourism. Therefore, fishing remains an important economic driver for the area (Watson and Beleiciks, 2010; Houston, et al, 2000; Package and Conway, 2010).

Fishing Culture

Fishing is important to the community and this makes fishermen important to the community (Package and Conway, 2010). It takes a special kind of person to be a fisherman. Fishing requires hard work in a harsh, unforgiving environment. Fishermen live for prolonged periods of time on small, often cramped, vessels with other crew members and limited privacy. However, fishermen take pride in the ability to withstand the rigorous work conditions and the ability to withstand the work conditions makes one an insider (Ashford and Bourassa, 1998). Being an insider is essential. Much of the work of fishermen is dependent on other fishermen, for safety and to decrease the uncertainty associated with fishing. Studies have suggested that fishermen share similar characteristics cross-culturally: aggression, courage and independence (Acheson, 1981). Acheson (1981) points out the necessity for fishermen to be organized and be able to work well in groups. A man's very life may depend on his fellow boat mates. "Fishing takes place in a very heterogeneous and uncertain environment. This uncertainty stems not only from the physical environment, but also from the social environment in which fishing takes place. The sea is a dangerous and alien environment, and one in which man is poorly equipped to survival" (Acheson, 1981, p. 276). Fishermen form obligatory relationships with other fishermen that simulate a brotherhood, an understanding that they are dependent on each other for safety and to decrease the uncertainty associated with fishing. They help each other in times of need and share information in a reciprocal way to benefit all (Acheson, 1981).

Even though it takes a special kind of person to fish for a living, there are incentives. The monetary promise of the next big catch provides a strong motivating incentive for most that accept the challenges of the sea. Historically, shares from the harvest were divided in set percentages, dependent of position and experience. A guaranteed portion of the catch provides

the necessary enticement to stimulate a crew to work long hard hours (Ashford and Bourassa, 1998; Acheson, 1981). The independent work environment, and the vastness of the ocean, attracts some. Fishermen like their work (Package and Conway, 2010). They like the independence, the income, the variety in tasks, and working outdoors. Others fish because it's a family tradition. Most crews are made-up of friends and family members and engage in egalitarian relationships, which strengthen a crew's ability to work cooperatively and help to ensure vessel safety (Acheson, 1981; Ashford and Bourassa, 1998; Package and Conway, 2010).

Agency culture

Regulation enforcement impacting the trawl industry happens at the federal fishing regulation level, the state level and cross over the two levels with safety regulations. All the agencies have heavy workloads, limited funding and use a variety of ways to communicate with each other and with the fleet. None of the agencies have an official educational outreach employee position (Conway and Gilden, 2002). The three levels of enforcement are also all intertwined with the federal level being the umbrella in which the others operate under. The top-down management with federal regulation has great regional influence and power in policy implementation, failing to recognize local community ecology or consider local knowledge (Package and Conway, 2010). Agencies do not attempt to organize the fishermen that are affected by the policy being implemented. Often agencies do not understand social organization or human motivation and implement policies that have unpredicted and adverse side effects. Top-down management approaches curtail adaptive management at the local level and the ability to problem-solve management issues through the use of blanket regional regulation (Acheson, 2006).

There are some noted differences amongst the regulating agencies cited in the literature. The federal agency was perceived by the fleet in more negative terms than the other regulating agencies. They have little to none physical presences in the community and even though they want to work with and communicate with the fleet they have been reported to only work with the fleet when they have to. The administrative structure of the agency impacts the interaction they have with other agencies and with the fleet. Federal level regulation enforcers have been reported to suffer from low morale due to lack of staff recognition, heavy workload, limited funding and connectivity to others in the agency (Conway and Gilden, 2002).

The state agency and the regulation enforcers enjoy a more positive image with the commercial trawl fleet (Package and Conway, 2010), in part due to its past outreach efforts, but also because the state has a presence in the community. State fishery biologists frequent the docks and work as a liaison between the state and the fleet. ODFW, which is the agency responsible for state regulation, is funded through user fees and has a commitment to users. Part of their customer service action plan includes ensuring stakeholders feel heard, valued and part of the decision making process, like holding regular meetings to gain input from the fleet (Conway and Gilden, 2002).

The U.S. Coast Guard (USCG) is a branch of the military and therefore operates with a top-down, authoritarian decision making manner. Even though the coast guard is considered a branch of the military and operates as a military arm, it is not the first to be considered in budgeting matters and is currently operating with insufficient funds and outdated equipment. The USCG not only is assigned the duty of national security, but also enforces federal fishery regulation and sea safety. It has been reported that the local USCG station has had a positive

working relationship with the fleet and the fleet depends on the local USCG for safely crossing the bar and in times of crisis like when a vessel goes down (Package and Conway, 2010).

Research Methodology

This research used a qualitative approach to investigate the relationships between enforcement agents and trawl fishermen. The goal was to determine if there are different relationships at the different levels of regulation, and, if so, what impact do those different relationships have on compliance. The interviews were a sample of convenience that began by first identifying key contacts in each of the targeted audience groups. Business cards with researcher contact information were given to key commercial trawl fishermen notifying them of the opportunity to voluntarily participate in the study. From there a snowball sampling method (Berg, 2001) was used to establish a database of participants for ethnographic interviews.

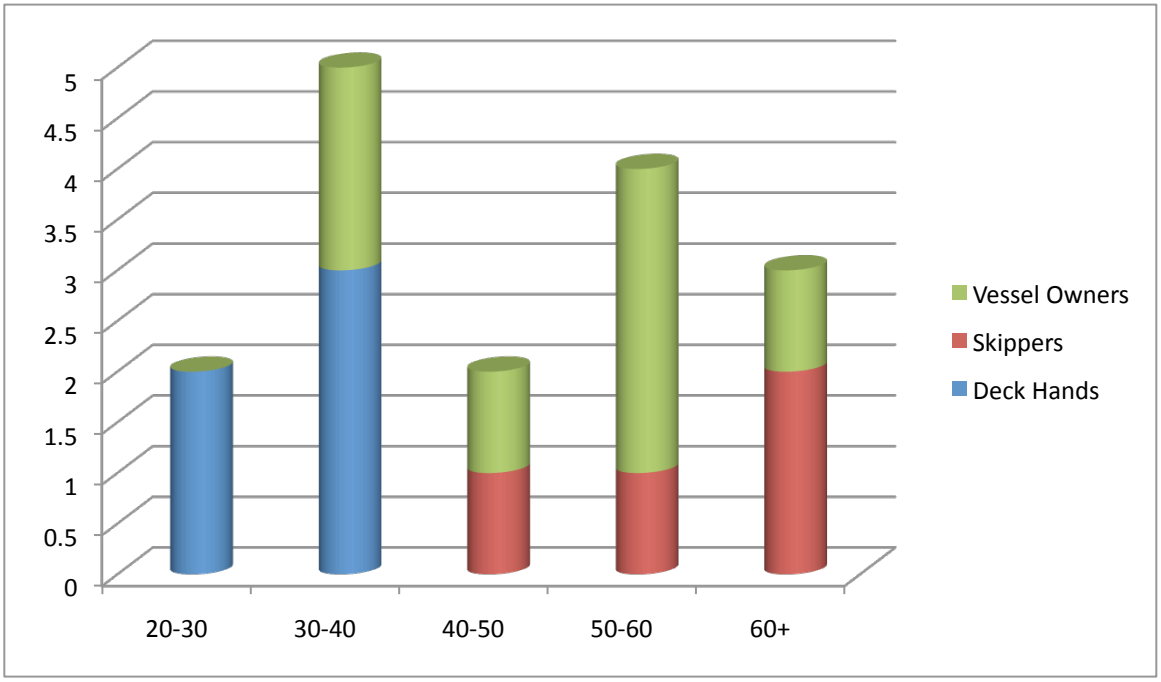
Twenty-one semi-structured interviews were conducted; 16 from the commercial trawl fishing community and 5 from the enforcement community. The commercial trawl interviews consisted of bottom and mid-water groundfish trawlers and shrimpers, and participants included boat owners, skippers and crew. The enforcement community interviews consisted of federal, state and coast guard enforcement agents. Table 2 presents the groups being interviewed. - The totals add up to more than the total numbers of interviews as some participants were involved in more than one fishery.

Table 3 looks at the age demographics of the fishermen interviewed. The fishermen interviewed ranged in age from their early twenties to over sixty years of age. The two youngest vessel owners were sons of vessels owners and the family had a corporation with several vessel of which the sons had ownership of vessels within that family corporation.

Table 2. Distribution of interviewees.

Bottom trawl	4 boat owners
	5 skippers
	3 deck hands
Mid-water	3 boat owners
	3 skippers
	1 deck hand
Shrimpers	2 boat owners
	7 skippers
	2 deck hands
Enforcers	1 Federal enforcer
	2 Oregon State Police
	2 United State Coast Guard

Table 3. Age demographic information of the trawl fishermen interviewed



All trawl fishermen were made aware of the study before having to make the decision of whether or not to participate. Only one fisherman chose not to participate and a separate fisherman that did interview chose not to answer specific or general questions about marine protected areas, all others that contact was made with chose to participate and permitted the interview. All trawl fishermen contacts were given informed consent documents before

interviews began. Members of the regulation enforcement community are well documented on agency web sites or at agency offices, and were contacted directly to request an interview, at which time they were presented with the informed consent document. Members of both communities were contacted initially in person or by phone.

Interviews were tape recorded, transcribed verbatim, and content analysis conducted. During the semi-structured interviews, open-ended questions were presented according to a predetermined interview guide (see Appendix). Each interview took between 30 to 90 minutes, and took place at a time and location convenient for each participant. Participants freely asked questions of the interviewer. In addition, the interviewer asked probing questions when issues were brought up in the interview process (Berg, 2001).

Question development was determined by the research question's initial focus, which was to discover if there were different relationships at different levels of regulation enforcement and if so, what effect those relationships had on compliance within the trawl fleet. The questions were designed to elicit information about communication within and between the groups, relationship development within and between the groups, the culture of each group, as well as the interactions within each of the groups and between the groups.

Newport, Oregon provided the ideal place of study due to having an active trawl fleet and having each of the enforcing agencies located within the community. While the insight gleaned from the study will not be generalizable to other fishing communities, it may provide insight into the role relationships between enforcers and fishermen play in compliance within the community of interest.

I was able to interview fishermen from over half of the trawl vessels in the fleet and interviewed a representative sample of deck hands, a portion of the fishermen not commonly

interviewed. I was able to accomplish this through my familiarity with the local fishermen; as a result of living in the area for over twenty years; being raised in the industry, as the daughter of a deck hand that spent much of my childhood on the back of a fishing boat and due to my intern work with Oregon State Sea Grant and the local outreach agent.

The data collected were analyzed by coding and grouping common ideas, thoughts and themes. Themes that emerged supported the primary objective of the research and gave insight into the existing relationships and the various factors impacting relationships within each of the groups and between the groups. Furthermore, a fuller understanding of issues impacting compliance emerged.

Results and Discussion

The IDA framework requires a level of understanding about the conditions of the community and the structure of the groups before an analysis of the interactions can be examined. Once the basic structure is laid out, a closer examination of the specific attributes of the groups was investigated, along with the types of interactions that occurred within the groups and between the groups. Within this analysis, three major themes reappeared throughout the interviews regarding the culture of the groups which dictated the interactions within and between the two groups. The first theme had to do with the connections a person has with others in order to gain regulatory information. The second theme had to do with the various tools that are used to ensure compliance. The final theme had to do with the level of knowledge and understanding regarding regulation, as well as the actual level of compliance. The basic structure of the community and the groups involved is discussed followed by a more in-depth discussion of the characteristics of each of the groups and the resulting interactions within and between the

groups. The themes that emerged throughout the interviews will be used to guide the more in-depth discussion.

Conditions of the Community

As revealed in the literature review section of this paper, Newport is a centrally located coastal community with the highest level of revenue from fish landings in the State (Van Voorhees, 2010). Fisheries are regulated by different entities depending on the location of the fishing activity. State regulation covers from the shore 3 nautical miles out to sea. ODFW is the regulating agency for state fisheries and the enforcement arm for the state is the Oregon state police. Federal regulation covers fisheries that take place in federal waters, 3 nautical miles to 200 nautical miles, including the EEZ. NMFS is the regulating agency for federal fisheries and the enforcement arm is the USCG (see Appendix: Table 1). All federal regulation has been adopted by the state and therefore all state troopers are deputized to enforce federal regulations, as well. The USCG, in addition to acting as federal fishery enforcement, also regulates and enforces sea safety (Wallace, et al). The port is unique due to all of these regulating and enforcement entities being located in the same community. In addition, Oregon State University is a short distance inland from the port and has many scientists and affiliations in the community that interact with the local fishing fleet, including the Hatfield Marine Science Center. The enforcement community felt having all the regulating and enforcement agencies locally in the community accounts for a portion of the level of compliance in the port.

Fishing Community Structure

Newport has roughly 250 commercial vessels, 18 of which are trawl vessels. Each vessel operates with at least three crew members. A trawl vessel pulls a funnel-shaped net through the water to harvest groundfish or shrimp. The net is wide at the mouth and tapers back to a narrow tube called a cod end that collects the catch. There are different types of trawl gear for fishing different depths of water. There are mid-water trawlers, bottom trawlers and shrimpers. Trawlers fish in both federal and state waters (Grant, 2003), and they have undergone numerous layers of regulation in a relatively short period of time. One enforcer reveals how the level of change in regulation is a hindrance:

> *"Part of the problem [is] there are all these changes and it doesn't give enough time to see how the third, the second or the fifth change has worked. So here you have a change, you have it implemented for a year, that's not working or we're gonna change it to something better, but how do you know this wasn't working and I just finally figured out this one… I think it would be nice to just let it be for a while to see how the species are reacting, to see how fishermen are reacting, to see who is in compliance, who isn't,… why aren't people in compliance, what's making them out of compliance."* (Enforcement Agent)

Both enforcers and the fleet agree that the level of regulation within the industry is high:

> *"And right now I think it's pretty, pretty regulated. And I think it's the most regulated it's ever been."* (Enforcement Agent)

Or as a local trawler put it:

> *"We're regulated out the whazoo."* (Skipper)

Regulation Agency Structure

Many agencies are involved in fishery enforcement, but there are few enforcement officers. There are two Federal agents for the entire state. There are 8 state level enforcers with one that is responsible for commercial fish for Newport and while the USCG has a local coast guard station and numerous regional personnel on its large cutters, they have only 1 local safety

enforcer. Basically there is an enforcer for each level of regulation and often they are responsible for covering large areas usually more than simply one port. One enforcement officer summed up the issue of limited enforcement agents by saying:

> *"The problem with fishing is its 24 hours a day, 7 days a week. It never sleeps and there is always something going on. So Newport has 4 troopers, 1 primarily concentrates on commercial fish, so we can't touch it to really adequately monitor it probably how it needs to be monitored, we just barely scratch the surface."* (Enforcement Agent)

Fishing Culture

Theme 1 - Connections

Fishermen reported being connected to each other. The majority of fishermen agreed that they have good relationships with each other and are committed to looking out for one another. While competition is part of fishing, so too is cooperation. The reality of fishing requires cooperation and the fleet reports not having any secrets amongst them. They talk regularly and communication is comfortable:

> *"Umhum. Directly talking. Basically anything we have to do- we trade between fishermen. It's traded between the fishermen now. Not between law enforcement and fisheries. We have to figure it out for ourselves."* (Skipper)

Owners share information with skippers and skippers talk across boats. Over half of the fishers interviewed agreed that the majority of information about regulation comes from other fishermen, specifically owners. Whether that information is passed down to crew members depended on the owner of the vessel and or the skipper. Some skippers reported that owners do not necessarily keep them informed of regulations and the majority of skippers interviewed said they only told crew about specific regulations when it directly impacted fishing practices, as indicated in the following quote regarding the dissemination of regulatory information:

> *[It's the vessel owner's responsibility]"To convey it [regulatory information] to the captain… Well the crew doesn't need to know whether or not; I mean the crew is informed if they happen to be driving a tow. No it doesn't go to the crew; unless they are on wheel watch and you say don't cross this red line. You know?"* (Vessel Owner)

The way fishermen related to enforcers varied to some degree and will be discussed in greater detail in the interaction between groups section of the discussion. However, the idea that individual attitudes determined if and how relationships with enforcers developed came up in a quarter of the interviews along with the idea that there is a generational difference between attitudes of fishers towards regulation and enforcement. When asked to expand on that idea, it was reported that the older generation of fishermen fished in a time when few regulations existed and they had a harder time adjusting to the new way of fishing, which consists of heavy regulation. Whereas, the younger generation of fishermen never knew any other way and have only fished under heavy regulation and accepted it as part of doing business. The younger generation also expressed a need for regulation:

> *"Some of the old timers don't like the coast guard just because they're old timers and stubborn in their ways but things are changing as far as safety regs now. They're [older fishermen] being stubborn, about you know- we have new regulation and they're [older fishermen] like why do we have a new regulation? The younger generation is more in tune with it because it is more safe.* (Deck Hand)

Over half of those interviewed expressed the idea that fishermen felt enforcers did not think highly of them, those sentiments ranged from simply not trusting or caring about their opinions, to viewing them as criminals. As a result there was a small portion of fishermen interviewed that did not trust enforcers and an increased amount of fishermen that simply chose to avoid enforcement officers.

Theme 2 - Tools

Some of the tools that are used for compliance aid in this feeling of distrust. The Vessel Monitoring Systems (VMS) is a compliance tool that many of the fishers interviewed harbored ill feeling towards, at first but have come to accept it as part of doing their job. Besides not feeling trusted and therefore requiring a monitoring system to track where certain types of fishermen are, there is also the increased expense to fishermen associated with the VMS monitoring and having to pay to be enforced.

The observer program is another tool for improved compliance that fishermen feel disdain for. A large number of those interviewed expressed the need for accurate data collection by observers and that failure to do so could potential result in penalties to fishermen. While many in the fleet acknowledged that observers possess an abundance of biological fish knowledge, there were many that reported that having an observer was another indicator that fishermen were not to be trusted and in return observers were seen as inconvenient, as snitches, as an added expense required of fishermen in order to be able to do their job:

> *"They're [observers] alright. I mean you got to have them. It's another thing, something else you got to have. We're gonna have to pay for it. That's another thing we're gonna have to pay, right now the government is paying for it but after next year we gotta pay to actually go to work."* (Skipper)

Another topic that came up regarding the tools fishermen use for compliance was that the specific tool being used impacted the level of compliance differently. Not all fishermen use the various tools. Not all crew members know the purpose of specific tools or ever use some of the tools. Another important aspect that came up was lack of internet at sea and fishermen's lack of interest, time or knowledge to glean regulatory information from the internet:

> *"I mean who's gonna go read the federal register to see what's in there? I mean you'd have to sit there for days."* (Skipper)

Fishermen respond to new regulation through adapting fishing practices and creating innovative ways to continue to fish while meeting the new regulation. All the enforcers that were interviewed, as well as a number of those in the fleet, acknowledged the fleet self-regulates. The ITQ management system allows for fishermen to manage their own catch and be accountable for both targeted species as well as bycatch. The flexibility in the ITQ system is structured like a cap and trade system. It allows fishermen to buy, sell or trade quota. Therefore the idea is, if a fisherman lands more fish than his quota, he is able to purchase the needed quota from someone else in the fleet.

Fishermen agree that the best tool for learning about compliance is word of mouth. Both fishermen and enforcers recognize the role the processing plant plays in disseminating information about regulation. The processing plant works towards incentivizing self-regulation in the shrimp fishery. Because they have a monopsony on the product, they do not have to buy shrimp if it does not meet specific size standards and without a buyer, fishermen are unable to sell their product. Regardless of the influence, whether it's the ITQ management system or even the monopsony the processing plant has to help incentivize self-regulation, fishermen have always participated in both self-regulating and self-reporting, because they recognize the connection between self-regulation and the health of the fisheries:

> *"Well yeah fishermen by large are honest people. They want the fish to be around. They want to earn a living for years to come. They don't want to catch the last fish in the ocean and so most of them are [honest]. They stick to the rules."* (Vessel Owner)

A concern that came from fishermen related to ITQs and other management tools was the idea of the full ecological impact being ignored or at least not being considered. This ranged from effort shift, that had the potential to alter the ecosystem balance, to the way discards are

handled (no longer being dumped at sea to act as feed for other species, but being hauled in for catch accounting and used for other product production). Fishermen reported wanting to provide management with information, but because of the way fishermen report information is not seen as a valid scientific data collection and therefore undervalued.

Theme 3 - Knowledge, Understanding and Compliance

A third of the fishermen interviewed proposed wanting more workshops, where they could learn about regulation and give information regarding the impacts of regulation. There was even the desire for mandatory meetings voiced. In addition, fishermen felt the need for vessel operators to receive a separate license. The indication that fishermen want trainings and different levels of certification came out of the last theme presented in the interviews regarding the knowledge and understanding, and its impact of the level of compliance. Fishermen reported the need for information on regulation. Fishermen and enforcers alike acknowledged the responsibility of knowing the regulations is that of the fisherman. However, time constraints were the major reason reported for not being able to look up and learn new regulations. A quarter of the fishermen interviewed recognized attending management meeting was one way to get information on new regulations, but a fishermen must decide to go to meetings or fish. Therefore, the majority of those attending regulatory meeting are boat owners that do not fish, which reinforces the notion that who you know determines what you know:

> *"Not all the skippers are running around reading all the paperwork and stuff can get lost between the people who are receiving it, and the people who are actually, you know, the people who have to live by it. That can be an issue, you know."* (Skipper)

There appeared to be different levels of knowledge and understanding regarding regulation within the fleet depending on the position held by the fishermen. Deck hands were considered workers by themselves, skippers and owners. Most deck hands reported being unaware of regulations unless the regulation had a direct impact on them, like license requirements. Some skippers reported not knowing all the regulations under which they fish and stated that owners take care of any infractions or fines.

Regardless of the different levels of knowledge and understanding of the regulations and rules, the level of compliance was considered excellent by everyone interviewed. Fishermen and enforcers alike reported that most fishermen follow the rules. Fishermen report they have no choice but follow the rules. In addition a large percentage of fishermen interviewed said that the goal of regulation was sustainability of the resource, which benefits the fishermen in the long run.

Agency Culture

Theme 1 - Connections

Agency culture supports the idea that being connected to others promotes compliance. When fishermen and enforcers are connected, fishermen have a direct link to information and a clear understanding of regulation:

> *"I'll meet somebody there [at a management meeting] or I'll develop a relationship there, they'll be involved in some other industry groups and they'll invite me to come and talk. I talk to industry groups at their meetings. We've held public kinda town hall meetings when certain regulations are being looked at that might have an impact..."*
> (Enforcement Agent)

Relationships between enforcers and the fleet also benefit enforcers. All the enforcement agents interviewed relied on fishermen to disseminate information, as well as provide information. All the enforcers interviewed harbored the same view regarding the value of face to face contact with the fleet. The consensus amongst the enforcement agents was that face to face contact with the fleet was important, but their workload and other work related responsibilities often took priority. However, the officers interviewed reported being contacted on the phone by the fleet. All of the agents have published contact information that allows fishermen to access them when they need to for concerns or questions. In additions, both fishermen and enforcers interviewed acknowledged that when new regulations come out or at the opening of specific seasons enforcement agents do go down to the docks. Another time enforcer's presence was noted on the dock was when they were enforcing regulation. One of the ways the agencies attempted to address the issue of minimal physical contact with the fleet is by ensuring the relationships between agencies is strong and that all the agencies are delivering consistent regulation interpretation.

Theme 2 - Tools

The biggest impact on developing and maintaining relationships with the fleet came up in every enforcement interview and several fishermen interviews, is the lack of manpower within the enforcement community. Agents are essentially a tool for compliance and according to the interviews conducted it appears there are too few:

> *"I would say no [there are not enough enforcers] and I think we try to make that case with the council and even with the industry, we let them know we are constrained by our resources. It requires us to work together. It requires us to rely on the industry to be compliant and help us be most effective."* (Enforcement Agent)

The various agencies involved in enforcement operate in a technological environment. Agents are used to contacting each other through email, as well as locating information they need on the web. The most prevalent tool used by agents for disseminating information about regulation is the internet. Every agency had a web site with posted regulations on it. In addition, both the state and USCG have publications that can be accessed in print through their offices. Mailings came up in a large percentage of the interviews and the content ranged from bi-monthly federal registry mailings to specific fishery related newsletters:

> "*NOAA has a web site that they post information that the coast guard will often broadcast references to that information and web site links and stuff like that."* (Enforcement Agent)

> *"We're left on our own to figure out what the regulations are. You gotta go down national register and look it up on the internet, which is a joke to try to find."* (Skipper)

Theme 3 - Knowledge, Understanding and Compliance

The knowledge and understanding about the level of compliance is difficult to gage due to the number of regulations and the multiple ways to interpret the regulations. However, every enforcer interviewed agreed that compliance in Newport (and more generally on the west coast) was very high:

> *"Overall the West coast itself has the best compliance rate in the nation. Compliance here is much better than the rest of the country particularly here in Newport. Most of these fishers are very responsible."*
> (Enforcement Agent)

Enforcers from various agencies reported the goal of regulation was sustainability and therefore it was much more important that fishermen know the regulation and have a clear understanding of where the regulation stems from than simply being punished for disobeying the regulations:

> *"That's one of the things you have to balance cause if you're out there just enforcing every regulation- there is just a lot of regulation and there is a lot of ways people can mistakenly not do things they are supposed to do but we really need to look at compliance as to how it effects the resource whether it is something damaging the resource or not. And with very few resources it's hard to catch the ones that are purposely violating the law and per say hiding fish in hidden compartments and taking them off at night without the assistance of industry to help identify the bulk cause those people are taking away their livelihoods away as well. So we need that communication with them and cooperation between the two but if you're down there enforcing every little regulation there is to enforce they're not gonna have that cooperation, it's damaging to that relationship."* (Enforcement Agent)

Furthermore, a violation at the state level constitutes a criminal offense, whereas, a violation at the federal level constitutes a civil offense resulting in very large fines:

> *"NOAA has a completely different system then us. Most of their stuff is civil you know there are civil violations and civil assessments that goes through their general council in Seattle. Everything we [state] do is criminal… NOAA regulation can be handled criminally based on whatever parameters they have. I think VMS incursion or something like that I think it could go criminal for them based on whatever factors they have but I think historically most of that stuff has been handled civilly. There are some well most federal regulation is adopted by the state. You know administrative rule. We [the state] enforce all those. You know criminally."* (Enforcement Agent)

Either way the consequences of violating the regulations are stiff and enforcers want to make sure they are not just punishing fishermen that inadvertently violate regulations and rather enforce the regulations by first ensuring fishermen are aware of the rules. Each of the agencies felt it was partly their responsibility to educate fishers on regulation requirements.

Interactions between fishermen

Themes 1 - Connections

The interviews conducted revealed that fishermen talk regularly with each other: they meet at local taverns for coffee and breakfast; they see each other on the docks and share information. They communicate over the radio while fishing and they see each other around town and talk. Due to the small size of the community and more specifically the port, being able to identify and know all the local fishermen is not difficult. Every interview acknowledged that fishermen have ties to each other. However, there were some noted disparities within fishermen's relationships depending on position in the fishery. Owners have capital investment in the fishery and therefore have a vested interest in regulation development and keep abreast of new regulation as well as have input into the development of those regulations through council meetings:

> *"Primarily it's the boat owner or permit holder if they're different or a lot of we had some older boat owners that don't fish anymore but they still own a boat and have a crew that fishes it or their sons their relatives will fish the boat and they'll come collect information [at management meetings] to be able to share with their family and their friends that are fishing that couldn't come in."*(Enforcement agents)

> *"I'm involved in a lot of different stuff [management meetings] so I hear about a lot of stuff before the other guys do. So sometimes we get a heads from enforcement up on a particular issue they'll come down and talk with us, sometimes but not always."* (Vessel Owner)

Owner's share information that impact fishing practices with skippers and if those fishing practices impact other crewmen it will be passed to them. For the most part, crewmen are not part of regulation development and they have no idea why regulation is being adopted or what the potential impact of the regulation may be for them as individual fishermen.

Theme 2 - Tools

The tools being used for compliance reveal the pressure that is beginning to appear as the fishery continues to develop under the capitalistic conditions that exist. ITQs allow owners to buy, sell or trade quota to meet their needs. A couple of issues came out in the study regarding ITQs that need to be addressed. The first is that the quota amount was spread throughout all those who had a permit at the time, even if they did not necessarily land groundfish locally. For example, local vessels with a groundfish permit that fished groundfish in Alaska, received local quota. As a result the quota amount was spread thin between all the interested parties. Secondly, the bycatch quota assigned was so small in some instances that it did not meet the need of the vessel it was assigned to let alone provide enough to trade with other vessels, causing tension between the fleet. The third factor of ITQs that is influencing the fleet is the idea that smaller vessels are made better off if they lease their permits and do not fish their quota, which allows the vessel owner to continue to collect revenue from the permit without having to fish, but puts the vessels hired crew out of work. The consolidation of the fleet will result in winners and losers within the fishery. In addition, the ITQ system is impacting other fisheries that do not operate under an ITQ system. It was reported that due to the guaranteed quota groundfishers were choosing to fish other fisheries that were more lucrative and waiting until no better options exist before filling their groundfish quotas. This effort shift is currently being felt heavily in the shrimp fishery and is resulting in moving a cooperative fishery towards one of competition:

> "*I think are you talking about the ITQ system? I think there's gonna be winners and I think there's gonna be losers… Mmhmm. And the losers are the people that have been fishing on the same boat for 25 years or something and then they realize the owner of the boat doesn't really have enough fish to keep this boat going. So he just sells his fish and 3 people are out of a job. Those are the losers. Everything is going to consolidate and so basically people with the most money are going to win. Just like it always have been. You know? And so to me, how does that create jobs? And it pressures people into other industries."* (Vessel Owner)

Theme 3 - Knowledge, Understanding and Compliance

The knowledge and understanding about regulation within the fleet varies greatly, but does not appear to impact the level of compliance. The difference in knowledge and understanding about regulation appears to be related to the position a fisherman has in the industry. While, fishermen share information out of necessity, they only share the information that is necessary to do their job:

> *"They [Crewmembers] know because they are participating in the [gear] switch over. But that's the extent of it. It's not like, we don't sit down and have a public notice, we don't sit down with everybody on the boat and go over what we, yeah what's in the public notice. It's the skipper's obligation to abide by those rules and his crew is going to do what he's doing."* (Vessel Owner)

Interactions between Agencies

Theme 1 - Connections

The majority of interviews revealed that most of the information fishermen receive about regulation comes from other fishermen. Direct information from enforcement and management is told to a select few and the information is expected to be passed throughout the fleet. Connections and partnerships within the managing and enforcing agencies prove to be a powerful force that helps agents effectively manage the fishery with limited resources. The agents interviewed reported having strong relationships between the various regulating and enforcement agencies. Agents rely not only on internal resources within their individual agency, but rather rely on the collective resources of all the management and enforcement agencies involved in fisheries:

> *"Federally there are very few of us. We don't get down as much that is why the state is actually deputized to enforce federal law which they adopt as state law. So most of the federal fishery laws are adopted into state law. NOAA deputizes state officers to enforce and train on those regulations so they can do education at the dock generally. Cause there is a lot of them and few of us."* (Enforcement agent)

NOAA funds four Oregon State Police positions and in return is able to utilize the services of Oregon State police. In addition to state troopers being deputized to enforce federal level fishing regulations, the federal level of enforcement is able to utilize the state level enforcers to do outreach with the fleet in times of regulation change. All the enforcement entities interviewed report the common practice of joint ventures to not only display a united front to the industry, but also as a way to strengthen their individual limited resources.

Theme 2 - Tools

The biggest tool used for compliance is the agents themselves. There are the shared positions between agencies and the joint operations that alleviates burden on any one specific agency while strengthen the collective action and ensuring consistency. Consistency was brought up by every agent interviewed as well as fishermen. Agents use every opportunity possible to ensure consistency. They cross-train and use the time to ensure regulation interpretation is understood by the various agents enforcing the regulations:

> *"With these new IFQs there was training session for coast guard and OSP together which was nice. We all heard the same training from NOAA at the same time."* (Enforcement Agent)

They have frequent phone contact and predetermined line of command for clarifying interpretation. Each agency has a clear internal chain of command and a chain of command exists between the agencies.

Theme 3 - Knowledge, Understanding and Compliance

With all the opportunities to define regulation interpretation there is still discrepancy from time to time. There are a large number of regulations and enforcement agents have areas of responsibility and while those areas cross over, no one agent has all the answers. Fishermen reported that one of the biggest barriers to compliance is consistent interpretation. Consistency takes time to coordinate both between agencies and within agencies. Mandatory multi-agency meetings to ensure consistency and clear chains of command for questions regarding consistency, all take time. When a fishermen asks a question about regulation agents have to investigate the answer before giving that information out to the fleet to ensure that all fishers are operating under the same understanding:

> *"It's always stumped a cop too. We might of heard a regulation they don't agree with and want to make sure that's correct and so they'll ask me and so if I don't know I'm gonna have to research it cause I'm the one that's given them the tickets."* (Enforcement Agent)

> *"You know the biggest pit fall with communicating with fishermen is um is keeping it consistent especially with officer to officer, agency to agency, ah you know keeping that consistent message. Ah you know fishers are very innovative. And they come up with some very good questions that you know concerning the regulation you know they say why can't I do that and you know the problem with the regulation state and federal, is you know sometimes there's room for interpretation and you know so we've all learned the hard way. About going out on your own and making a call. You know 9 times out of 10 that's not right."* (Enforcement Agent)

Some of the fishermen interviewed said that answers to questions they have depend on which agent they talk to and reported that the mood of the enforcer also made a difference.

Interactions between fishermen and enforcers

Theme 1 - Connections

By far the biggest issue that came out of the interviews between the industry and the enforcement community is the lack of connections between the two groups. Most fishermen reported not having direct contact with the enforcement community at all, including not having a contact person within each of the agencies or even contact information for certain agencies. Most of the fishermen interviewed that reported having some contact with the enforcement community, said that their relationship with them was strictly professional. However, there were some fishers that reported differences in relationship development between the agencies.

Just as the literature suggested, the agencies with the most stable connection to the fleet appeared to be the agents involved in the State regulated fisheries. This was true for not only fishermen involved in state regulated fisheries, but also for fishermen involved in federally regulated fisheries. An indicator of the strength of the relation between state enforcers and the fleet is the number of fishermen that knew the local OSP enforcement officer's name. In addition, fishermen reported that the state troopers knew their name. Part of the reason for the familiarity between the two groups is the amount of time the various state agents spend down of the docks enforcing regulation, doing regulatory educational outreach for the fleet, or collecting data for management decisions. The role the state biologists play in connecting with the fleet came up in both fishermen interviews and enforcement agent's interviews. The fleet reported knowing the state biologist, because they were always down at the docks and the fleet felt comfortable interacting with them to gain information about regulation. Another aspect that helped to solidify relationships between the fleet and the state came up in the interviews with the agencies. State employees are rooted in the community. They live and work in the community and are not subject to relocation in the same way that both the USCG and the federal agents are:

> *"It can be harder to get ahold of those guys [federal agents] really of no fault of their own they are never in their office they're usually you know*

> *the agent here he could be in Astoria or he could be in Florida. They move their agents around the country and even out of the country quite a bit… we're [state agent] permanent and we're here."*(Enforcement Agent)

The fleet reported that access to OSP is good, that responses from the State are timely, and that the State offers the best source of information from an agency about regulation:

> *"Well the local state police here are really good people you know. We talk to them on the docks all the time cause they're always around. They are probably are close form of communication at an enforcement level."*(Owner)

The relationship with the USCG revealed varied response from the fleet. The majority of fishermen that commented on their relationship with the USCG said they had positive relationships with the local fleet that ensure sea safety regulations, but had very different experiences with the large regional cutters that ensured federal fishery regulations. Part of the difference in relationship development appeared to be due to the familiarity with the officers. Local USCG officers were reported to come down to the docks and complete vessel inspections, as well as offer trainings that the fleet attended. Those fishermen that knew the name of a USCG contact knew the conductor of sea safety training. The relationship with the regional cutters was reported as non-existent. Fishermen reported feeling threaten by the aggressive boardings and use of what was described as intimidation when boarded:

> *"They board the boat and search us and they take a couple of hours to do it, you know… You know the patrol boats I've been telling you about. So I called the commandeering officer at the coast guard station and I bitched. This is BS you keep on boarding us and boarding us and he said Mr. X the best thing I can tell you is to give us plans to your boat and they can search you that much faster. Just a belligerent message. I felt kicked."* (Vessel Owner)

> *"He threatened us, the guy that was in charge of the [USCG] boarding party, threatened us that if we didn't, how did he put it, if we didn't settle down he was going to go through the whole boat and find as much wrong with it as possible."* (Skipper)

The relationship with federal enforcement investigators did not appear to have such extreme differences. Some fishers did report having a good, collaborative, working relationship with the federal agent, especially boat owners that were involved in the rationalization of the fishery. However, the majority of fishermen reported having no relationship at the federal level, to the point very few fishers could name a federal agent. The fleet reported and the agencies verified that accessing a federal agent is very difficult, due to the limited number of agents and the vast area they cover. Lack of physical presence down at the dock came up in several of the interviews and appeared to be part of the barrier in forming relationships between the federal enforcement level and the fleet.

The observer program is a federal program and it did receive mixed reviews from the fleet. For the most part the observer program was seen as an inconvenience. Because Newport is a small community and the port is relatively small, there are a limited amount of observers, which actually appeared to act as a buffer in forming relationship between observers and the fleet. Inevitably observers are going to serve on multiple trips with a vessel, which gives them time to get to know each other and form more meaningful relationships. In addition, due to the size of the community fishermen and observers are bound to interact on land, as well.

Theme 2 - Tools

Again the most effective tool for compliance is the agent themselves. Observers are not considered enforcement agents; however, they are in a position to provide information to the

fleet as well as to enforcement agents. The importance of observers providing correct information was stressed in more than one interview as well as the importance of providing up to date data to both the enforcement community and the fishing community. The use of observers seemed to solidify the lack of trust fishermen feel enforcers have for them. The recent implementation of regulation, requiring a crew member and an observer to stay onboard until the offload occurs, came up multiple times as proof that no trust existed between the two groups:

> *"The observer has to stay on the boat until they start the off-load. So for example you go out and you come in on a Saturday night and the processor says no we're not gonna unload you until Monday morning. One of your crew men and that observer has to stay on that boat until the off-load starts. In other words they think you're probably gonna climb down in the fish hold and sort fish at the dock and through it in the bay or something, whatever they think."* (Vessel Owner)

Another position that could enhance the enforcement role is that of an outreach agent. Having no formal ongoing regulatory educational outreach at any level of enforcement proves to be a great barrier to equitable access to regulatory information. However, the biggest barrier to compliance that resides in an agent's power is the consistent interpretation and application of the regulations. Over half of the interviews conducted revealed that uneven implementation of the rules within a fishery as the leading cause for issues around compliance:

> *"No. you just get 1 answer from 1 guy and another answer from another guy, and neither are right, so. And if they're the ones writing you the ticket then they are right."* (Owner)

Theme 3 - Knowledge, Understanding and Compliance

Cross training helps solidify the collective responsibility of regulation. The strong relationship between the agencies also proves an important piece of effective service delivery, as

well as the clear chain of command and open communication within and between the agencies. However, the most impactful reason for the high level of compliance that appeared to be evenly distributed between the various fisheries appears to be due to State enforcers being charged with not only enforcing state regulations but federal regulations as well and because of the strong relationship they have built with the fleet this may account for the even level of compliance across the different levels of enforcement.

Conclusions

The IDA framework provided a template for organizing a way to think about the complexities of the interactions of fishermen and enforcers and lead to an understanding of potential outcomes that could result from those interactions. However, some of the necessary components identified by Ostrom's and there assumptions did not appear to be reflective of the realities of all fishery interactions. Ostrom suggests the major participants and their position must be defined (Ostrom, 2007) and they are well defined in the trawl industry and the enforcement community. There are clear positions and a separation within the enforcement community. The State, federal and safety enforcers all worked under a chain of command within each of their agencies and an overarching chain of command existed between the agencies. Boat owners, skippers and deck hands from the bottom, mid-water and shrimp fishery all held specific positions within the industry and had different expectations depending of the position held.

Ostrom reveals that each participant must be aware of the potential outcomes that exist and the linkages between their actions and outcome when determining the appropriate action (Ostrom, 2007). The potential outcomes that existed in the examination was basically to comply with regulations and continue to fish or violate the fishing regulations and incur the expenses

associated with the getting caught. However, violations occurred at the fishermen level whereas, expenses incurred was at the owner level. The level of regulation and monitoring left little room for cheating the system and very few opportunities to cheat and not get caught existed, regardless there appeared to be a miss alignment between who commits an action and who pays for the action.

Ostrom states, the amount of control participants have matters (Ostrom, 2007). The assumption is that if a participant has control over regulatory issues it will lead to compliance. The amount of control participants' have in regulation development and exercise in complying with regulations varied. Boat owners that do not fish have very little control over what happens when the vessel is fishing, yet they are the main entity involved in regulation development. Deck hands also appeared to have little control over whether a vessel fished legally or not, due to the perception that they were workers following orders, no deck hands examined actually participated in regulation development. Skippers appeared to have the highest level of control over whether a vessel followed regulations, yet very few are involved in regulation development.

Ostrom outlines access to information as a necessary component for compliance (Ostrom, 2007). However, the access to information did not support this idea of who has control. Owners were the ones with access to regulatory information, but not all of them passed the information to the skipper running the vessel and even fewer crew members had access to regulatory information. This seems counter intuitive due to the high level of compliance. Those fishermen actually out on the ocean fishing were not necessarily the ones with access to information.

A partial explanation for this discrepancy might be explained by some of the tools being used by the fleet and management. Fishermen have plotters that tell them where they cannot fish. In addition, management's decision to move to an ITQ system has the potential to alleviate the

number of enforcers needed to enforce regulation within the fishery. Because the number of vessels is smaller than the number of fishermen and because vessels are more permanent than some positions within the industry, most of the regulations being applied happen at the vessel level and not necessarily at the individual level, making it possible to utilize fewer enforcers, while keeping the appearance of a compliant fleet. Cost and benefits play out differently for vessel owners working for long term gains versus crew members working toward short term pay offs. Cost of violating the rules could potentially jeopardize the vessels ability to continue to fish, due to the expense associated with violations being assessed to the vessel owners, whereas the benefit of violating certain fishing regulations may result in a small but immediate monetary gain for crew members with fewer enforcers under an ITQ system to ensure individual accountability.

This study revealed that regardless of the effort to provide consistency throughout the enforcement community, there are different types of relationships between the various levels of enforcement and trawl fishermen. However, compliance remains consistently high among the various levels. The real difference in relationships occurs within the fishing community. Boat owners have a higher level of access to information. Crew members' access to information is limited, which creates barriers to fully understanding regulations. Furthermore, crew members have minimal incentive to participate in regulation development and in a sense the development of the fishery has eliminated the need for them to participate in the process.

A potential policy solution could be embedded in the development of the ITQ system. The groundfish rationalization is still in the process of being fully developed and it is still possible to address issues to strengthen the system to benefit those involved in and those dependent on the resource. If the ITQ system were to consider crew shares it could create the incentive for crew members to be involved in policy development, ensuring their participation

and a more complete representation of those impacted by regulation, in fishing policy development, as well as create incentive for crew members to value long term fishing investments, alleviating the temptation for illegal short term pay-offs. Furthermore, crew shares would require the knowledge of who the crew members are and may result in a crew registry which could serve as an avenue for tracking crew members and disseminating regulatory information to those that actually fish.

The ITQ system has the potential to offer solutions to some of the issues plaguing enforcement and the industry, but it also has the potential to create negative impacts for other fisheries, the Newport community and the groundfish fishery specially. As a result of the ITQ system an effort shift is beginning to happen amongst the Newport fishermen. Groundfishers have a guaranteed quota and they are shifting their effort to more profitable fisheries and returning to fish their groundfish quota when no other opportunities exist. The interviews conducted revealed that the majority of this effort shift in Newport is happening in the shrimp industry and a once cooperative fishy is becoming competitive. This effort shift has wider implications for the Newport community and could potentially result in the overcapitalization and stock decline of other fisheries.

Although each region has unique issues that management needs to tailor individual solutions for, effort shifts under an ITQ system is not one of them. It's evident that a guaranteed quota will result in advantaging some and disadvantaging others. Its rational behavior for fishermen with that guaranteed quota to engage in other more profitable fisheries and hold off fishing their quotas until no other opportunity exists. ITQs have been used in many other areas of the world and they offer a wealth of knowledge and guidance in developing the West coast groundfish rationalization. Alaska has fished under an ITQ system for nearly two decades and

has implemented side boards to protect against this effort shift. The West coast needs to be pro-active in protecting its fishing diversity and fishing communities by not waiting for issues to arise before addressing them. Having a more complete representation of the entire fishing community in the rationalization process could assist in ensuring that their interests are considered when developing the specifics of the ITQ system.

A further complication of the ITQ system for the community is the incentive smaller vessels have in leasing or selling their quotas to the larger more efficient vessels. Vessel owners/permit holders would be able to make money from their quota without even fishing but the crew of those vessels would be left without work. Considering that most trawl vessels operate with a skipper and 2-3 deck hands this could result in huge impacts on employment opportunities for local fishermen. Crews could benefit from organizing and participating in policy development. The idea of crew shares discussed earlier could serve as a platform for organizing and incentivizing the participation of crew in the policy development as one way to protect their interests.

The final potential outcome for fishermen working under an ITQ system is the unforeseeable consequences the management system might have on fishermen's safety. The idea that 100% catch accounting may mean that a skipper has to make a choice between dumping an overloaded vessel's catch and losing that portion of the quota and the revenue it would have generated for his crew or hauling in a load too large for the vessel to safely transport and putting himself and his crew in jeopardy is a reality the fleet is currently facing. Adaptive management may be the only answer to address unforeseen issues like this that may arise.

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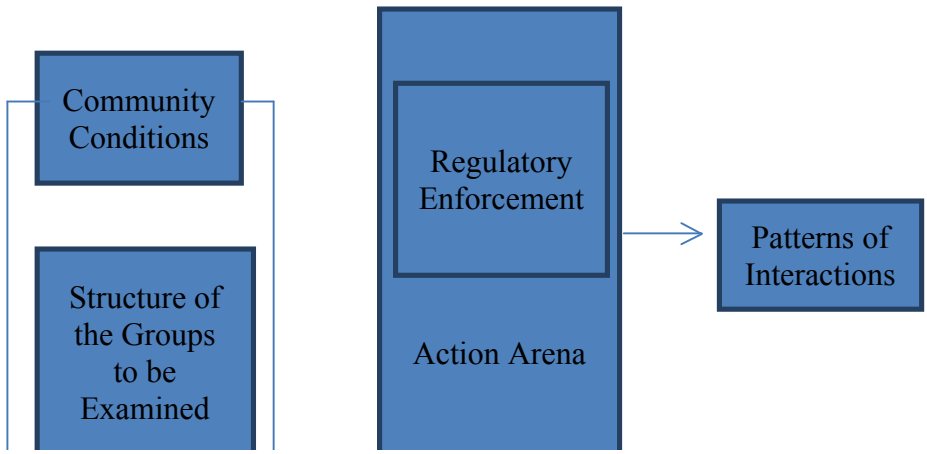
Appendix

Table 1. Relationship between regulating agencies and enforcement agencies.

	NMFS	ODFW	USCG	OSP	NOAA
Federal Fishing Regulations (Policy Development)	X				
State Fishing Regulations (Policy Development)		X			

State/Federal Safety Regulations (Policy Development)			X		
Federal Fishing (Regulations Enforcement)			X	X	X
State Fishing (Regulation Enforcement)				X	
State/Federal Fishing Safety (Policy Development & Regulation Enforcement)			X		



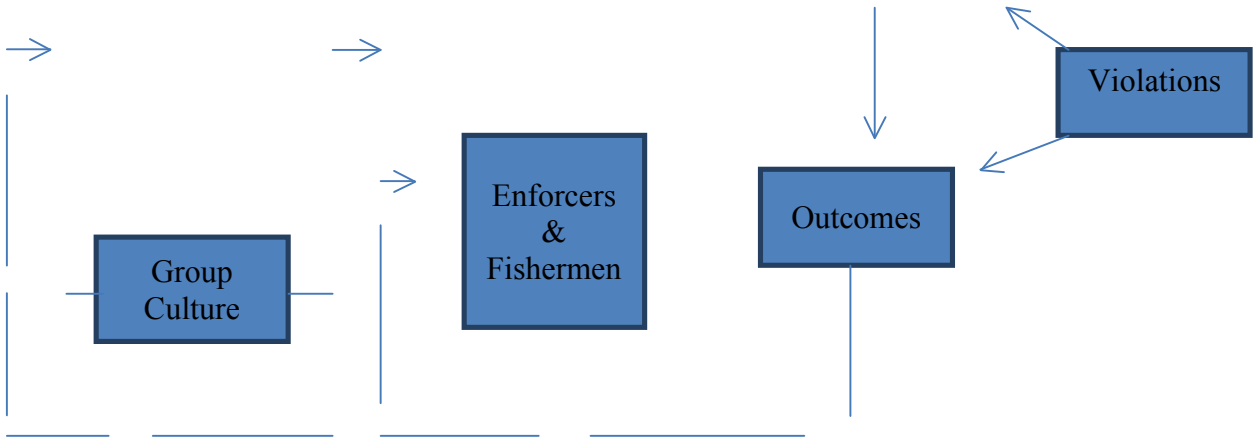


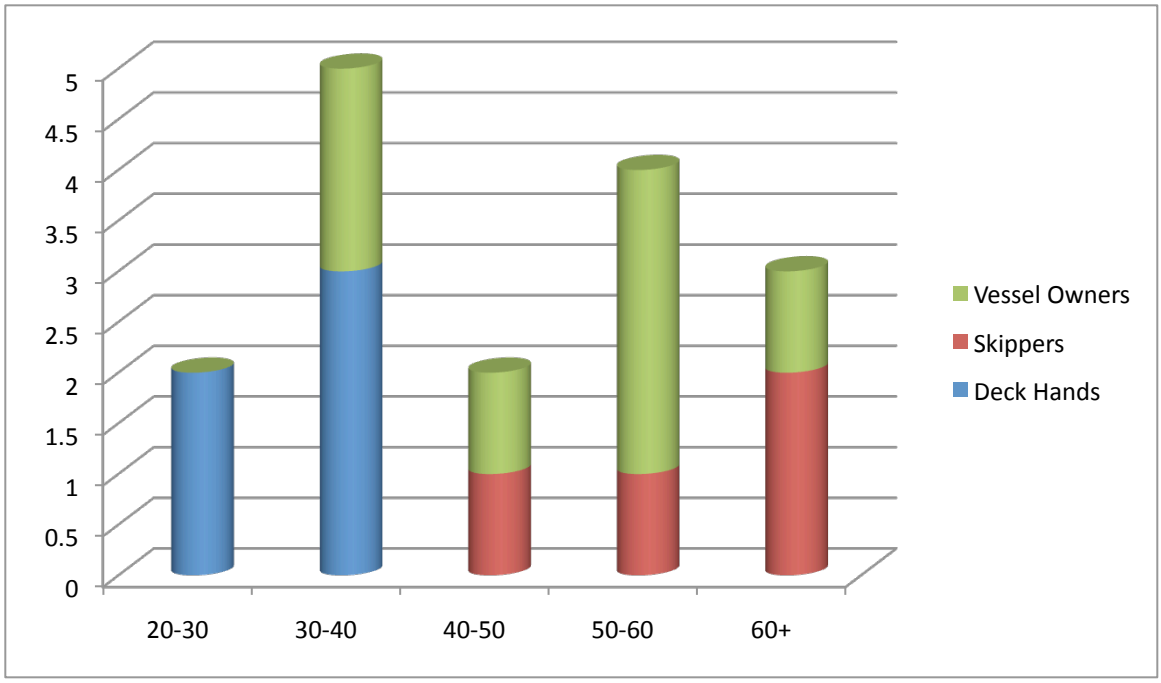
Figure 1 A Framework for Institutional Analysis
Source: Adapted from E. Ostrom, Gardner, and Walker (1994, p. 37)

Table 2. Distribution of interviewees.

Bottom trawl	4 boat owners
	5 skippers
	3 deck hands
Mid-water	3 boat owners
	3 skippers
	1 deck hand
Shrimpers	2 boat owners
	7 skippers
	2 deck hands

Enforcers	1 Federal enforcer
	2 Oregon State Police
	2 United State Coast Guard

Table 3. Demographic information of the trawl fishermen interviewed


5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
20-30
30-40
40-50
50-60
60+
Vessel Owners
Skippers
Deck Hands

Guide for Interview Questions

1. Tell me about your communication with fishermen/enforcers regarding regulation?
    - Content (what)
    - Process (how formal vs. informal)
    - Time (when)
    - With whom (who)
    - Where (location)
    - What are some ways to improve communication, if any?

2. Please talk with me about your relationship with fishers/enforcers?
    - Comfort with communication, connection, interaction
    - Access to them
    - Timing of interactions
    - What are some ways to improve relationships, if any?

3. Talk with me about the tools that are used for Compliance
    - Log books
    - VMS
    - Self-regulation

- Observers
- Enforcement agents
- Other

4. Talk with me about the places of compliance
   - At sea
     - RCA
     - MR
     - NNMREC test berth
   - on shore

5. Please share your perceptions about the level of enforcement (at land and on sea)
   - adequate,
   - appropriate
   - How is the knowledge of the infraction delivered?
   - What are some ways to improve enforcement, if any?

6. Please share with me your perceptions about the level of compliance
   - adequate,
   - appropriate
   - What are some ways to improve compliance, if any?

Definitions

- Agency: Refers to the individual enforcement agencies or a combination of the three.
- Agent: Agent refers to the individual enforcers from the State, federal or the USCG.
- Communication: Refers to the sending and receiving of information.
- Fishery: Refers to a group of fish that are managed together.
- Fleet: Refers to the fishing vessels in Newport community- specifically the Trawl fleet, but can also mean the entire fishing fleet across different fisheries.
- Industry: Is the Trawl fleet and the fishermen that make up the fleet.
- Institution: Refers to the structure of a group that promotes social order and cooperative decision making of the individuals within group.
- Interaction: Refers to the communication both verbal and nonverbal between two or more individuals or groups of individuals.
- ITQ: Individual Transferable Quota. Refers to the management system that that accounts for 100% catch accounting of both targeted species and bycatch. Permit holders are given set guaranteed quota for the year for both their targeted species, as well as their bycatch and allowed to buy sell or trade portions of their quotas as needed to self-regulate and remain compliant.
- Rationalization: Is the process that NMFS went through to implement the ITQ system. Also known as catch shares.
- Relationship: Refers to interactions between two or more individuals or groups of individuals that are built on familiarity with each other and a certain level of trust.
- Trawler: Refers to a fishing vessel that pulls a net through the water to harvest groundfish and shrimp.