

SOUTH ATLANTIC FISHERY STAKEHOLDER PERCEPTIONS OF CATCH
SHARES: A THEMATIC ANALYSIS OF PROPOSED AMENDMENT COMMENTS

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ABSTRACT

SOUTH ATLANTIC FISHERY STAKEHOLDER PERCEPTIONS OF CATCH SHARES: A THEMATIC ANALYSIS OF PROPOSED AMENDMENT COMMENTS

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How to effectively manage fisheries has been a topic of much debate throughout the academic literature. Recently, many academics and fisheries' managers have called for the implementation of catch share programs, a market-based solution to fisheries management. While many fishery councils in the United States have successfully implemented these programs, the South Atlantic Fishery Management Council (SAFMC) has struggled. In order to better understand how stakeholders in the South Atlantic feel about catch shares, a thematic analysis was conducted using comments submitted to SAFMC concerning three separate catch share amendments. The study results revealed that majority of the stakeholders who were financially invested in the fisheries (fishermen and industry workers) were overwhelmingly against the catch share amendments. On the other hand, nonprofits were consistently in support of catch share amendments. Those against catch shares discussed the potential impacts on the economy and the lack of data, whereas those in support of catch shares more frequently discussed environmental impacts. This thesis concludes that SAFMC could benefit from increased communication with stakeholders and collaborative research initiatives.

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DEDICATION

This thesis is dedicated to my father, Paul Wiegand. You have always had faith in my ability to work hard and to achieve great things. My life lesson: Never stop chasing your dreams; there is nothing that hard work and passion can't achieve.

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Introduction

The struggle to find a successful way to manage natural resources is nothing new to policy makers, resource managers, and resource users. The management of fish stocks is no exception to this rule; and as more research is conducted, it is becoming more and more apparent that strong and successful management techniques are going to be necessary to prevent the collapse of the world's fisheries. The United Nations' Food and Agriculture Organization report on the State of the World's Fisheries and Aquaculture found that half of the world's fisheries are fully exploited, and another quarter of the world's fisheries are overexploited or severely depleted. The numbers don't look much better in the South Atlantic region of the United States, which includes North Carolina, South Carolina, Georgia, and Eastern Florida. According to the National Oceanic and Atmospheric Administration's (NOAA) Fish Stock Sustainability Index (FSSI), as of June of 2012, five species in the South Atlantic are overfished, while eight species, including three species already overfished, are currently experiencing overfishing (National Oceanic and Atmospheric Administration (NOAA), 2012)¹.

The fishing industry, as in many other parts of the world, is an important component of the coastal communities in the South Atlantic, providing not only jobs for commercial fishermen but also jobs for fish processors and dealers, boat sales and repairmen, and those involved in the tourism industry such as dive shops and charter boat

¹ NOAA considers a fish stock overfished when it drops below the minimum stock size and management is necessary to rebuild the stock to its Maximum Sustainable Yield (MSY). NOAA defines overfishing as occurring when a fish stock or complex is experiencing a rate of fishing or fish mortality that prevents it from producing the MSY.

owners. Between 2007 and 2009, commercial fishermen in the South Atlantic landed 108 million pounds of fish and shellfish, amounting to \$151 million dollars in revenue to the coastal community. Recreational fishing also has quite an impact on the region with 84 million fish caught in 2010. With the coastal community's population at 15.7 million people in 2010, both the direct and indirect benefits generated by the fishing industry are important for the community (National Oceanic and Atmospheric Administration, 2011).

It is the job of the South Atlantic Fishery Management Council (SAFMC or the Council) to make sure that fisheries in the South Atlantic are protected. In 1976, Congress enacted the Magnuson Fishery Conservation and Management Act. The Magnuson Act extended the United States' Exclusive Economic Zone (EEZ) to 200 nautical miles off of the coast. The Act also established eight fishery management councils whose responsibility it would be to create fishery management plans for all fisheries located within the EEZ. Members of the fishery councils are appointed by the Secretary of Commerce from a list of nominees created by the state governors. Members consist of state representatives, the National Marine Fisheries Service (NMFS) region director, and other individuals with fishery knowledge such as academics, fishermen, government officials and fishing industry employees. The fishery councils also receive advice from numerous committees such as advisory panels for individual fishery management plans (FMPs), the Catch Share Committee, Scientific and Statistical Committee, and many, many more (see Appendix A). The councils are required to hold annual committee meetings that are open to the public; for example, SAFMC holds four meetings annually, one in each state under its jurisdiction. Finally, before enacting any

new regulations, the councils allow for a commenting period and often have public meetings to discuss the impending regulations.

There have been two major reauthorizations to the Magnuson Act since its introduction that affect the fishery councils. First, in 1996, the Sustainable Fisheries Act was combined with the Magnuson Act (now known as the Magnuson-Stevens Act). This reauthorization charged the eight fishery management councils with additional responsibilities in order to prevent the collapse of commercially important fish stocks. The councils, in addition to providing management measures that would protect fish species from being overfished, were now required to lessen the amount of bycatch and protect important habitats. The second reauthorization, which happened in 2006, also changed the responsibilities of the fishery councils. They are now required to establish Annual Catch Limits (ACL) for all fisheries under their jurisdiction and to increase fishermen's accountability. The 2006 reauthorization also states that fishery councils should begin considering market-based solutions to fisheries' management, such as catch share programs or limited access privilege (LAP) programs. Catch shares is an umbrella term for the method of setting an annual total allowable catch (TAC) and allocating shares of that catch to fishermen.

SAFMC has attempted to implement catch shares and LAP programs but has been unsuccessful, especially in comparison to the other fishery councils, five of which have multiple active programs. SAFMC, on the other hand, has only one active catch share program, the Wreckfish individual transferable quota program, which was implemented back in 1991 before the reauthorization of the Magnuson-Stevens Act. The goal of this study was to understand the opinions fisheries' stakeholders have of catch share programs

and how those opinions vary across stakeholder groups. In order to investigate stakeholder opinions, comments concerning three catch share amendments, each at a different stage of implementation, were analyzed by conducting a thematic analysis. The results showed little variation between stakeholder groups, with the most important themes being management specifics and economic impacts and the least important theme being environmental impacts. The lack of thematic variation between stakeholder groups who were in favor of catch shares and those who were against catch shares coupled with the presence of themes expressing concern about science and data and stakeholder relationships could be indicative of low social capital between stakeholder groups. This thesis concludes by providing implications for fisheries management and continued catch share development.

Chapter one of this thesis will discuss the difference between open access fisheries and managed fisheries as well as traditional fisheries management methods. Chapter two will discuss the move to market-based management: the theory as well as the practical application within fisheries. Chapter three reviews stakeholder participation in the management process. Chapter four will feature the three catch share amendments that are part of the analysis. Chapter five will detail the data used in the analysis as well methodology. Chapter six will present the results of the analysis as well as a discussion of the results. The final chapter will conclude with aspects of the research that could be improved as well as avenues for continued research.

Chapter 1: Fisheries as a Common Pool Resource

Open Access vs. Managed Fisheries

The cost of allowing our natural resources to remain open to all individuals has been well-known and understood since Garrett Hardin's famous article *Tragedy of the Commons* (1968). In this article, Hardin illustrates how this "tragedy of the commons" works by explaining how farmers shepherd their cattle in a common field. The story goes that a farmer has the incentive to continue adding cattle to a field with limited spaces because the benefit of having the extra cattle is felt only by the farmer whereas the cost of less grazing spaces is felt by all of the farmers. This situation is essentially the same for fisheries: the benefits of overfishing are felt by the fisherman but the costs of overfishing are felt by the entire fishing fleet.

The key to preventing this situation is management. In his article Hardin suggests management by a strong central government or by privatization of the resource. Experience thus far has shown that Hardin was correct: Open access fisheries have resulted in overexploitation and collapse (Hardin, 1968). Even further, management methods that rely on the consensus of stakeholders or do not provide the ability to monitor and enforce regulations have continually resulted in collapse (Hilborn et. al., 2005). Successful institutions, however, include strong government control, defined property rights, and even, in some cases, local cooperatives (Hilborn et. al., 2005). Getting to this type of management is not a simple endeavor; it requires a strong institutional system that provides the incentive for fishermen to act in a way that fosters

the conservation of their resource. The most important step toward creating institutions that have the ability to foster sustainability is looking for equity, stewardship, regulatory resilience, and efficiency (Hanna, 1995). Whether or not the current fisheries management mechanisms are achieving these goals is up to significant debate.

Traditional Fisheries Management

Failure of fisheries management is often blamed on a lack of science or poor stock assessment methodology. While science clearly plays a role in how well fisheries are managed, sound scientific data is not sufficient to guarantee successful fisheries management (Dietz et. al., 2003). In fact, focusing solely on the biological issues and problems creates management mechanisms that ignore the economic value of fisheries as well as human welfare (Davis & Gartside, 2001). Fisheries are fundamentally based on relationships: the relationship between those who are governed (resource users), the institutions, rules and management mechanisms used to govern, and finally the ecological systems (Jentoft, 2007). How traditional fisheries management methods have failed or succeeded depends on the specific management institution. Private property, top-down government management, and community management all have distinct costs and benefits (Acheson, 2006).

Fisheries are commonly managed via top-down regulations. This causes stakeholders to believe that the government is exclusively in charge, preventing beneficial communication (Lane & Stephenson, 2000). This is often a result of the scientists, engineers, and managers having too little concern or consideration for the local culture. This may seem like an insignificant factor; but, in fact, if managers do not properly understand the local culture, they will be unable to select the appropriate

incentives for conservation. This lack of concern for local cultures often leads to frustration through the community and, ultimately, poor management techniques (Acheson, 2006). For example, case studies have shown that the permit system that is currently in place throughout fisheries in the United States and abroad offers the wrong incentive to fishermen. Instead of focusing on conservation, fishermen are focused on fishing as much as possible as quickly as possible (Cinti et. al., 2010). Even worse, when all stakeholder opinions are considered, governments often place more concern on being fair to all stakeholders as opposed to achieving goals. This focus on “being fair” simply results in all stakeholders viewing some part of the process as flawed (Eagle & Kuker, 2010).

One could argue that local cooperatives would be a more successful method of management because those that are involved in management are a distinct part of the local culture. While there has been evidence of this type of management working, it has all been theoretical (Hilborn et. al., 2005). However, in order for local cooperatives to be successful, numerous societal elements need to be present including a community with a high amount of social capital, secure resource boundaries, and homogeneity (Acheson, 2006; North, 1990; Ostrom, 1990, 2000).

Some scholars argue that the correct tools for managing fisheries, clear and well-defined property rights, exist but have not been legally enforced (Beddington et. al., 2007). It is often thought that property rights are most successful when they are coupled with other management mechanisms such as regional management, protected areas, and strong monitoring (Couper & Smith, 1997). Property-rights, often coupled with market-

based management mechanisms, have been widely discussed throughout the literature and are now regarded as the future of successful fisheries' management.

Chapter 2: Market-Based Management

Theory Behind Market-Based Management

Property rights and market-based mechanisms are based on neoclassical economic theory of property rights and privilege (Wingard, 2000). The argument for market based solutions to common resource management stems from many disciplines. The key issue is that when held as a common property, resources do not yield any economic rent. The lack of economic rent results in the overcapitalization of the fisheries and eventual depletion (Gordon, 1954). Following this idea, the issue with fisheries becomes a question of ownership. Common property is typically open access or “owned” by the government or sometimes by a community or other collective entity. This often results in practical confusion. In order to help better conceptualize property rights, Schalger and Ostrom developed five levels of property rights: access, withdrawal, management, exclusion, and alienation. Access is the right to enter a specific property; withdrawal is the right to extract from the property (ie. the right to fish); management is the right to regulate the resource; exclusion is the right to determine who does and does not have access to the property; and finally, alienation is the right to buy or sell any of the previous rights (1992). Market-based solutions typically give resource users the right to alienation. However, there has been research that shows that market-based regulation, while supported theoretically, in practice collaborative management often appears more successful; and managers should focus on splitting the right to management between public authorities and civil societies, including resource user groups (Dubbink & van

Vilet, 1996). Property rights are inherently embedded in all aspects of resource management, including the ever changing historical, political, and social climates. Current resource management has failed examine how property rights are affecting management and, instead, have focused on resource communities. This has unfortunately led to a focus on community failures instead of market failures. What needs to happen is a focus on how markets are affecting user groups' actions as opposed to how user groups are affecting the market (McCay & Jentoft, 1998).

In simple terms, the goal of property rights and market based solutions is to provide resource users with a stake in the resource that will provide them with the incentive to make sacrifices in the name of sustaining their resource (Acheson, 2006). Property rights achieve this by altering the economic flow of the resource in a way that essentially eliminates competition, allowing resource users to make decisions towards sustainability (Beddington et. al., 2007). When it comes to property rights for extractive resource users, the goal is to decrease overcapitalization of the resource, while at the same time, achieving efficiency by increased income to users. This can be done through the leasing of shares or other similar arrangements (Acheson, 2006).

Simply establishing property rights is not sufficient for successful management; there are other management mechanisms that need to be in place in order to protect resources. First, the rights need to be clearly defined. Often times, confusion of property rights is the result of freely giving rights out to resource users. This method almost always results in the failure of property right regimes (Acheson, 2006; Bromley, 2008). Second, there needs to be enforcement to ensure that those who have shares are only extracting the resource amount that they are allotted by their shares and that those

individuals who do not own shares are not participating in extraction. This enforcement also needs to be low in cost to both the managers and the resource users (Acheson, 2006).

Property rights may not always be the correct solution to common resource management, depending on the characteristics of the resource to be managed. For example, in situations where there are long time horizons, uncertainty about the continued availability of the resource or increasingly high economic pressures, users may have more of an incentive to exploit the resource even in the presence of clearly-defined property rights (Acheson, 2006; Coleman, 2011). Also, in situations where the growth rate of the resource is less than the discount rate, there is increased incentive to exploit the resource (Acheson, 2006).

Application to Fisheries Management

Property rights and market-based management solutions are applied to fisheries in the form of catch shares. As stated in the introduction, “catch shares” is an umbrella term for the method of setting an annual total allowable catch (TAC) and allocating shares of that catch to fishermen. There are many forms of catch shares, but the ones most commonly used in fisheries include limited access privilege programs (LAPPs), individual fishing quotas (IFQs), individual transferable quotas (ITQs), community quotas, and regional fisheries associations. LAPPs, sometimes referred to as dedicated access privileges (DAPs), are federal permits allowing the harvest of a specific amount of the TAC that can be issued to individuals or groups. IFQs and ITQs on the other hand are harvest privileges given to an individual or entity. The difference between IFQs and ITQs is that ITQs allow fishermen to sell or lease their share of the TAC to others. Community quotas are shares that are allocated to communities that are dependent on fishing for their

livelihood. Regional Fishing Associations (RFAs) are voluntary organizations that include recreational and commercial fishermen and industry workers that can be granted harvest privileges if they meet a list of specific criteria. These organizations may only receive access after initial allocation of rights (SAFMC).

All types of catch shares provide property rights that are more exclusive than traditional management methods. With traditional fisheries management mechanisms, there is no incentive for fishermen to conserve; and without that incentive, they will simply over-harvest the fishery with no regard to the long term consequences. This lack of incentive causes over capitalization and use of poor gear that typically results in high levels of bycatch. Traditional management mechanisms are not only failing to solve this problem; they tend to make it much worse (Fujita & Bonzon, 2005). As was discussed above, when catch shares are successful, they have the ability to prevent fisheries' collapse, while at the same time increasing efficiency and reshaping the political landscape (Hannesson, 2005; Huppert, 2006). They also can prevent overcapitalization of the fishing fleet by getting rid of the excess effort that is often present under traditional fisheries' management. As a result, there is an increase in fishermen's safety and ecological and economic gains (Chu, 2009; Fujita & Bonzon, 2005; Gibbs, 2007; Hilborn, 2007; Mackino & Bromley, 2002).

Catch shares are able to do this because they provide an individual incentive for conservation; and even more importantly, they provide a financial incentive for conservation. This financial incentive has the ability to decrease the level of competition making it easier for fishermen to make sacrifices for the long terms sustainability of the fish stock (Costello et. al., 2008; Hilborn, 2007). Large-N studies of catch statistics have

supported the idea that catch share management has the ability to prevent overfishing as well as help improve stocks (Costello et. al., 2008). The increased economic gain from catch shares can even be used to counteract the initial cost of implementation. Managers could take out loans from different organizations to be paid back using money from the economic gain, or they could enact user fees which would help extend the economic gains to the wider public (Fujita & Bonzon, 2005; Hannesson, 2005). Depending on the type of catch share program, other benefits can accrue. For example, community based quotas have the ability to keep all of the usual benefits of catch shares, while at the same time addressing costs within the community and minimizing social impacts (Wingard, 2005). It is important to note when investigating catch shares that the research is often focused on one discipline. This results in the identification of advantages in the eyes of one discipline while discounting the disadvantages to other disciplines (Gibbs, 2009).

Despite these theoretical benefits of catch share programs, opposition from stakeholder groups has resulted in many policies' failing before they have even begun (Hannesson, 2005). As a result, in 1996 the Sustainable Fisheries Act, an amendment to the Magnuson Stevens Act, placed a moratorium on catch share programs until 2002. Many argue that the issue with catch shares is that they are not full property rights and thus do not yield all of the supposed benefits (Copes, 1986; Mackino & Bromley, 2002). Others argue that the disagreement is not about the property rights but is about the economic windfalls some stakeholders will receive and the economic rents they will have in perpetuity (Mackino & Bromley 2002). This is especially true because with catch shares the benefits that are accruing are only experienced by those who are participating in the program (Branch, 2009). Since the goal of catch shares is to prevent

overcapitalization and excessive effort, consolidation of the fishery is a natural occurrence, meaning that there will be fishermen who are left out of the program and thus the benefits (Branch, 2009).

There are also concerns about whether or not catch shares will be able to protect fish stocks and the environment. Studies have shown that while catch shares have a positive effect on the target fish species, there are mixed effects on non-target fish species. This is possibly due to spillover from participants who have been pushed out of the target fishery and now must make a living by fishing the non-target species. It is also possible, especially in areas where there has been significant recent development of catch share programs, that fishermen will increase the amount they catch in order to increase their historical landings, a common element factored into initial catch share allocation (Branch, 2009). There are also certain characteristics that might make certain fish species unfit for catch share management. For example, those species that are short-lived, change quickly or are relatively unstable are likely to continue to collapse under catch share management (Copes, 1986).

The costs of catch share programs can also be a concern. Managers will need to invest in monitoring and enforcement in order to prevent by-catch, high-grading, and quota-busting. Without proper monitoring and enforcement, there is always a possibility that fishermen with shares will fish more than they are allocated or that those without shares will continue to fish regardless (Copes, 1986). The view fishermen have of property rights also has the potential to cause spatial problems, for instance, creating conflict when others want to use fishing grounds for the development of marine protected areas or coastal wind power initiatives (Gibbs, 2007). The biggest concern is that

biological and economic impacts will prevent catch shares from achieving their ultimate goals (Wingard, 2000).

There are some necessary requirements for catch share programs that may prevent or at least decrease possible damages. The way to decrease these damages is to make sure that catch share programs are coupled with other beneficial mechanisms such as strong monitoring and enforcement, marine protected areas, and effective TACs (Chu, 2009). For example, if managers establish the quota as the weight of fish a fisherman catches while fishing as opposed to the weight of fish a fisherman lands at the dock, there will be an incentive to use more efficient gear preventing bycatch and providing a negative incentive for highgrading (choosing only the highest quality fish and discarding the rest) (Branch, 2009). Determining how a catch share program should be designed in order to prevent damages is challenging. It is important to make sure that each program is designed with a specific fishery and community in mind (Copes, 1986; Fujita & Bonzon, 2005).

The literature is full of suggestions on how catch shares should be altered. For example, it has been suggested that fishermen should have to bid for shares via an auction process and that these shares should be for a limited term only (Bromley, 2008; Mackino & Bromley, 2002). In the end, while it appears that catch shares are theoretically sound, caution is warranted; and continued research into practiced catch shares is necessary (Copes, 1986).

Chapter 3: Stakeholder Participation in Management

How much participation stakeholders have in fisheries management varies with each individual situation. Even when stakeholder participation is encouraged long held tensions can make moving forward challenging. Despite the challenge, research has shown that management institutions that prevent fishermen from being involved and thus from becoming responsible resource users, prevents successful management methods from being developed. Instead, the development of management programs should be centered on the resource users (Lane & Stephenson, 2000).

Unfortunately, communication between stakeholders and managers is remarkably one-way. Often, the information that is communicated to stakeholders is not easily understandable (Government Accountability Office, 2006). An analysis by the Government Accountability Office determined five areas of communication that needed to be improved. First, there need to be more education and outreach efforts conducted. Second, the location, time, and format of annual meetings needed to be varied. Third, the development process should be simplified and streamlined. Fourth, diverse interests should be represented within the council process. Finally, the authority to make decisions should be shared among stakeholders (2006).

There is also a movement to make science more accessible to fishermen, but the democratization of science does not come without its challenges. It often involves the justification of allowing some individuals into the realm of science while still excluding other individuals. This is why fisheries' management should focus on the idea of

expertise as opposed to science. This requires the acknowledgement that some stakeholders might have expertise that is not traditional science. For example, fishermen's stories should be treated as experience that is valuable for fisheries management (Carolan, 2006).

Research has shown that involving stakeholders, especially fishermen, in the policy formulation process is especially important for fisheries' management. In particular, understanding fishermen's behavior can help managers implement the correct incentives for conservation of the resource (Hilborn, 2007). Fishermen often have beneficial knowledge of the fish stocks with which they interact on a regular basis (Neis et. al., 1999). In order to capitalize on this knowledge, other stakeholders, in particular fishermen and industry members, need to be given a leadership role within the government (Hanna, 1995; Lane & Stephenson, 2000).

The extent to which the South Atlantic Fishery Management Council is obligated to involve fisheries' stakeholders is outlined in the Magnuson Stevens Act's guidelines for implementation of amendments. The Council is required to publish in the Federal Register a notice of a 60-day public comment period with details about the implementation plan including details of the regulations, fishing eligibility, needs of the fishing community, costs of the program, and the procedures for implementation. During this 60-day window, the Council is also required to hold public hearings in all of the states that will be affected by the new regulations. Finally, within 45-days after the public comment window has closed, the Council must analyze the comments received and publish a final implantation plan in the Federal Register.

Chapter 4: Catch Shares in the US South Atlantic Region

Amendment 20A to the Snapper Grouper FMP (Wreckfish)

The only active catch share program in the South Atlantic is the Wreckfish ITQ. Developed in 1992 and preceded only by the Ocean Quahog and Surf Clam program in the Mid-Atlantic region, the Wreckfish ITQ is one of the oldest ITQ programs in the United States (NOAA, 2009). The directed Wreckfish fishery started in 1987 with only six vessels, but it began to increase rapidly once fishermen realized that Wreckfish could be marketed as a substitute for grouper (Gauvin, 2004). By the time SAFMC decided to try to bring the fishery under control, there were over 40 vessels in the fishery landing over 4 million pounds of Wreckfish (Gauvin, 1994).

Initially, a permit system and a Total Allowable Catch (TAC) were established, but this quickly led to a derby style fishery (Gauvin, 1994). As with all derby fisheries, not only did this make fishing particularly dangerous by increasing conflict and forcing fishermen to go out to sea in bad weather, but also it decreased the dockside prices fishermen could get for the Wreckfish because the market became flooded with fish (Gauvin, 1994).

These issues are what initially caused SAFMC members to begin considering an ITQ as an alternative method for managing the Wreckfish fishery. The goal was to address the economic and safety issues created by the derby fishery while, at the same time, giving fishermen a firm stake in the fishery and, as a result, an incentive to conserve

and protect the resource: the basic theory behind catch share systems of management (SAFMC, 2011). After a significant amount of debate surrounding who would be eligible for shares and how those shares would be allocated, the final rule for the ITQ program was listed in the Federal Register on March 5, 1992 (57 Fed. Reg. 7886-7892, 1992). Initially, the ITQ program struggled because fishermen were inexperienced and lacked the education necessary to make the ITQ a success. As a result the market place for Wreckfish shares did not run efficiently, and those who were looking to get out of the fishery were unable to sell their shares to other fishermen (Gauvin, 1994).

Currently, SAFMC is working on Amendment 20A to the Snapper Grouper Fishery Management Plan, of which the Wreckfish is a part, to redistribute all of the shares that are considered inactive to fishermen who are still active in the fishery (SAFMC, 2011). Committee meeting minutes reveal that many individuals, particularly those on the Snapper Grouper Advisory Panel, feel that Wreckfish ITQ program should simply be invalidated; and the fishery should be treated as open access (SAFMC, 2011). Others, like the Social and Economic Sciences Panel, believe that instead of redistributing inactive permits, an auction should be held; this way the money from the auctioned shares would be given to the original shareholder (SAFMC, 2011). Still others believe that it would be best to wait two years and let the fishermen know that shares not used in those two years would be redistributed (SAFMC, 2011). These differences in opinion all focus on one common theme: how to define an inactive permit and the appropriateness of interfering with the share market, regardless of whether or not it is functioning as initially intended. Once the Council decided to start looking into redistributing Wreckfish catch shares, they attempted to get into contact with all

fishermen currently holding a permit. As a result, the percent of inactive shares dropped from 41% to 28%, showing that some inactive permit holders were still capable of making the decision to sell their permits (SAFMC, 2011).

In addition to addressing the issue of inactive shares, Amendment 20A adds additional regulations, now required by the 2006 Magnuson Stevens Act Reauthorization. It establishes a share cap that will prevent any one stakeholder from owning more than 49% of the shares and creates an appeals process that would give fishermen a 90-day period to contest the number of shares they received during allocation (SAFMC, 2011).

Amendment 6 to the Golden Crab FMP

Along with Amendment 20A, SAFMC is also working to push through Amendment 6 to the Golden Crab Fishery Management Plan, which would establish a catch share program for the fishery. The hope is that establishing a catch share program will, among other things, prevent derby fishing, keep experienced fishermen who know how to protect deep-water coral habitat in the fishery, and create an incentive for fishermen to protect the economic efficiency of the resource (SAFMC, 2012).

The Council and the various Golden Crab committees and advisory panels have spent a significant amount of time discussing the development of the catch share program including the common issues of eligibility, allocation, and interaction with other regulations. However, meeting minutes indicated that Golden Crab stakeholders hold a multitude of opinions on why they do or do not want a catch share program for their fishery. For example, some are convinced that the catch share program will benefit the fishery and the environment as a whole by keeping experienced fishermen in and inexperienced fishermen out of the fisheries. Others have concerns about eligibility. The

current Amendment 6 legislation distributes 25% of shares equally among those fishermen who are eligible for the program and splits 75% of the shares based on historical landings from 1997-2010 (SAFMC, 2012). This would mean that the smallest permit would receive 2.27% of the Annual Catch Limit (ACL), which equates to approximately 44,000 lbs. of Golden Crab. The Council agreed that 44,000 lbs. would allow a fisherman three trips a year (SAFMC, 2012). The question then becomes whether the benefits (revenue gained from the landing of golden crab) of those three trips outweigh the costs associated with spending three days fishing (maintenance, gear, safety costs etc). If the costs outweigh the benefits, fishermen will likely be unable to continue fishing for Golden Crab.

Some stakeholders are also concerned that the goal of protecting the fish stock and environment will not be achieved due to how Amendment 6 may interact with or negate other regulations. Under the current regulations, Golden Crab permits are divided into three different sections: the southern fishing section, the middle fishing section and the northern fishing section. In order to fish in either section, you must have a permit specific to that section (SAFMC, 2012). Some fishermen hold permits for both sections, while others hold permits for only one of the sections. The new catch share program being proposed could potentially alter the functionality of this system. Once the catch shares have been allocated to individuals, there are no regulations in place that would prevent a fisherman who holds permits for both of the fishing zones from transferring all of his shares to a single permit or vessel (SAFMC, 2012). This has the potential to cause heavy exploitation of the species in one of the zones. The fishermen with permits for both zones would simply be able to move to the other once the crab became overexploited, but

fishermen who only hold a permit for the overexploited zone would be forced to stay in the devastated area, making it more challenging for them to land a substantial catch (SAFMC, 2012). It is also possible that a fisherman who holds a permit for the southern zone to buy shares from a fisherman who has a permit to fish in the middle zone; and as a result, the southern zone will be fished more than it was after the initial allocation of shares (SAFMC, 2012). SAFMC believes that because catch share programs are market-based management mechanisms that the market will take care of any potential exploitation issues and that the location of fishing vessels will be self-regulating (SAFMC, 2012).

Amendment 21 to the Snapper Grouper FMP

The most thoroughly researched fishery for catch share implementation has been the Snapper Grouper fishery complex. In order to better understand how catch share type programs would work in the South Atlantic, SAFMC formed the LAP Program Workgroup in 2006 to investigate how a LAP Program might work for the large and financially significant Snapper Grouper fishery complex. In 2008, two years after its creation, the LAPP Workgroup issued their final report. Ultimately, the Workgroup was unable to come to a consensus on whether or not a LAPP should be implemented in the Snapper Grouper fishery, but they did encourage the Council to continue to research the idea of LAPPs as a management method (Hartig, 2008).

The final report listed numerous benefits and concerns about the effects LAPPs might have on the environment and on the economic and social aspects of the fishing community. The primary concern was that there is a serious lack of data on the Snapper Grouper fishery, particularly in relation to looking at stock abundance (Hartig et. al.,

2008). This makes it challenging to tell whether or not species are overfished; and more importantly, it makes it challenging to set a TAC that accurately reflects how the stock has changed since the implementation of the LAPP. The workgroup wanted to make sure that improved methodology was introduced to ensure that, as time passed, the TACs would increase (Hartig et. al., 2008).

The yearly TAC increasing as time passes is particularly important in the Snapper Grouper fishery, which in the past few years has seen a number of species with TACs decreased drastically (Hartig et. al., 2008). This was another big concern for the workgroup: With TACs being set so low, it was possible that even fishermen with high historical landings, who would receive a large percentage of the allocation, would end up with such a small amount of actual poundage that they would be unable to stay in the fishery (Hartig et. al., 2008). If this LAPP program would have the potential to force the large fishermen out of the fishery, then the small fishermen would not have a chance to continue fishing. This could have devastating effects on the coastal economies, especially in areas like South Carolina, where majority of fishermen have permits to fish Snapper-Grouper species (Jepson, 2005).

This was not the only concern the workgroup had with how LAPPs were going to affect local fishing communities. The workgroup felt that a LAPP had the potential to change the geographic distribution of landings (Hartig et. al., 2008). If this were to happen, there might be communities that thrived with increased landings leading to increases in revenue and jobs; but there would also be communities that would be negatively impacted, losing not only economically but also culturally (Hartig et. al., 2008).

Fortunately, all of these concerns were coupled with possible benefits for the environment and fishing community. The Workgroup believed that a LAP program could benefit the environmental, economic, and social aspects of the Snapper Grouper fishery. Primarily, they felt that catch shares would give fishermen an incentive to participate in preservation of the fish stock, as is supported by market-based management theory. Coupled with increased incentives, catch shares would also prevent the overages that are common with the current quota management system. The local economy would benefit from catch shares because they would, theoretically, increase the TAC as well as allow fishermen more flexibility. Next, a decrease in the size of the fleet will result in an increase in the profits made from landings. Lastly, and perhaps most importantly, catch shares are socially beneficial because they are the most efficient management method for consolidation of the fishery, a necessity to prevent overfishing (Hartig et. al., 2008).

As a result of this study, the SAFMC not only continued to look into a LAP program for the Snapper Grouper fishery as recommended by the LAP Program Workgroup; but in 2010, it began developing and taking comment on Amendment 21 to the Snapper Grouper FMP. The purpose of Amendment 21 was to reduce the overcapacity of the fisheries, particularly with the goal of reducing the impact of the commercial fishing sector. However, due to strong opposition from stakeholders in March of 2011, SAFMC voted to terminate any more movement on Amendment 21. At this time, there has been no move to begin reconsidering catch shares for the Snapper Grouper FMP (NOAA Southeast Regional Office (SERO)).

In order to get a more complete picture of stakeholder opinions, comments submitted to SAFMC concerning the three amendments above are analyzed. This goal of

this thesis is to understand the opinions of different stakeholder groups regarding different aspects of the catch share programs for Wreckfish, proposed Amendment 20A to the Snapper Grouper FMP, Golden Crab, proposed Amendment 6 to the Golden Crab FMP, and Snapper Grouper, the proposed Amendment 21 to the Snapper Grouper FMP (Wreckfish). Specifically this thesis addresses two questions: “What are the biggest concerns about the catch share programs expressed by stakeholders in the comments?” and “How do the opinions of different stakeholders on catch share amendments vary from one another?” For more information on each amendment see Appendix B.

Chapter 5: Data and Analysis

Data Source

Amendments 6, 20A and 21 (Golden Crab, Wreckfish and Snapper Grouper, respectively) were chosen for analysis because they are all at different stages. Amendment 20A is addressing the Wreckfish ITQ which has been implemented for ten years; Amendment 6 is in the process of being developed and implemented; and Amendment 21 was discarded during development. While looking at the meeting minutes from the annual SAFMC meetings as well as advisory panel and other committee meetings gives a general indication of how fisheries stakeholders feel about these Amendments minutes are hardly exhaustive. Many fisheries' stakeholders may have other commitments or financial constraints that prevent them from attending a meeting. While only some stakeholders will be able to attend a SAFMC meeting, most stakeholders have the ability to submit a formal comment to SAFMC.

In order to investigate the opinions of different stakeholders regarding the Snapper Grouper, Wreckfish, and Golden Crab catch share amendments, a qualitative thematic analysis was performed on stakeholder comments on each amendment submitted to the South Atlantic Fisheries Management Council between late 2010 and early 2012. Data was obtained by contacting individuals at SAFMC to gain access to their database, which contains all of the comments submitted to them concerning current and past amendments. The comments include both emails and letters submitted to SAFMC during comment periods and otherwise, as well as submitted petitions and

transcripts from public comment hearings. The data set used for this research includes all of the comments available for each amendment. The amendments are all recent or currently still being discussed within the Council, so the data ranges from late 2010 to early 2012. There were a total of 4,874 comments. The majority of them concerned the Snapper-Grouper amendment (n = 3,811), followed by the Golden Crab amendment (n = 1,057), and the Wreckfish amendment (n = 6). For all three amendments, nonprofits submitted the most comments, followed by fishermen.

Analysis

An inductive thematic analysis of stakeholder comments was conducted, with a ground theory methodology originally discussed in Glaser and Strauss (1967). The purpose of grounded theory is to analyze the data to determine the theory as opposed to theory informing the data analysis. There are four parts to a grounded theory analysis: identification of codes that help to group the data, the creation of concepts, collections of codes that discuss similar concepts, the creation of categories that contain similar concepts, and the theory or explanation of the data.

The thematic analysis presented here consisted of three different stages: manual coding of comments by amendment, stakeholder group, and “for/in favor” or “against” catch shares (the codes step); a thorough reading of sixty-six comments to identify key themes (categories) and subthemes (concepts); and coding for the identified themes using the qualitative software NVivo 10 (identification of the theory). Initially, comments were separated by amendment, stakeholder group, and method of comment submission (transcripts for public hearings, emails, letters and petitions). The separation resulted in the identification of five different stakeholder groups: fishermen, industry workers,

government officials, managers, and nonprofit organizations. It is important to note that not all amendments received comments from every single stakeholder group. The fishermen stakeholder group included both commercial and recreational fishermen. Industry workers included those stakeholders who owned businesses directly affected by fisheries' management such as bait shops or charter owners. Government officials included congressmen. Managers included any stakeholders identifying themselves as a member of SAFMC or a member of one of the various committees. Finally, nonprofits included both environmental organizations and fishermen's advocacy groups.

Once all comments were separated by stakeholder group, five comments from each stakeholder submission type were selected randomly for in-depth analysis using a random number generator (a total of 66 comments). The comments were read individually, and the key points or themes in each comment were identified. A second researcher read and identified key points in order to ensure the reliability of theme identification. The second researcher identified similar key points. Then, collaboratively, these key points were classified into broad themes.

Five key themes were identified: environmental impacts, economic impacts, science and data, stakeholder relationships, and management methods. The themes were then divided into subthemes in order to get a more accurate picture of what stakeholders were discussing in their comments. The environmental impact theme includes discussion on the overfishing status of amendment species, displacement of fishing effort, protection of species, highgrading, bycatch, and habitat damage. As a result, the environment was divided into two subthemes: discussion of species impacts (overfishing and stock improvement) and discussion of habitat impacts (environmental damage or protection).

The economic impact theme includes discussion on how catch shares affect the number of jobs available, tourism, local seafood availability, price of landed fish, fishing fleet size, and the cost of going fishing. The economic theme was then divided up into three different subthemes: the discussion of jobs, costs, and tourism. The science and data theme deals with opinions on the data being used to establish catch shares including the availability and reliability of the data, possible bias within the data, and transparency of the data. The science and data theme was specific enough that the original read through of comments did not indicate the need for any subthemes. The fourth theme, stakeholder relationships, discussed the trust between managers and fishermen, the relationship between the recreational and commercial fishing sector, and the influence of nonprofit organizations on Council decisions, each of which were used as subthemes. The fifth theme, management methods, included discussion on the increase and decrease of regulations, traditional management methods, perceived ownership of the fisheries and property rights. The management methods theme was divided into two subthemes: discussion of traditional management methods and discussion of catch share specific regulations.

In conjunction with the identification of themes, all 4,874 comments were separated based on whether or not they were for or against catch shares. Each comment was briefly scanned to determine whether or not the commenter was for or against catch share amendments. A comment was identified as against a catch share if they expressed the opinion that catch shares should not be implemented in any fishery or if they were against the specific amendment. For example:

“Catch Shares are NOT about the resource they are all about creating a handful of fish lords who retire on the front porch collecting money from leasing public resources. They

shut out small businesses, eliminating countless JOBS and prohibit the young from participating in an honorable industry.”

Comments were identified as in favor of catch shares if they expressed support for catch shares in general or the specific catch share amendment. For example:

“I support the Council's progress toward better fisheries management through catch shares for the snapper, grouper and golden crab commercial fisheries.”

Once the comments were separated based on support of catch shares, a text-based analysis of all comments was conducted to identify the existence of themes within each stakeholder group and feeling toward catch shares. In order to analyze quickly a large number of comments based on these criteria a keyword search using NVivo 10 was conducted. NVivo 10 (QSR International) is qualitative analysis software that allows a researcher to analyze and organize textual data based on specific criteria. This includes the ability to run complex key word searches as well as the ability to code data into specific nodes or groups. When conducting a keyword search, NVivo allows researchers to determine how exact they would like the software to be when searching for a word. This can include a search for the exact keywords to a search for all the synonyms of a keyword. For the purposes of this analysis, the second exactness setting was used, which allowed for the search of keywords and all associated stemmed words (ie. overfishing and overfished). Keywords representative of each subtheme were used for the thematic analysis and were identified based on the initial thematic reading of the comments (see Table 1 for a list of keywords). The initial thorough reading of comments to identified themes showed little variation between submission type (email, letters etc.), so comments were analyzed based on amendment, stakeholder group, and catch share support only. The number of comments that mentioned one or more of the keywords was recorded. The

percentage of comments discussing each theme was calculated to determine how the themes varied between amendments and between stakeholder groups.

Table 1. Keywords used for stakeholder comment analysis.

| Theme | Subtheme One | Subtheme Two | Subtheme Three |
|----------------------------------|---|--|---|
| Environmental Impacts | <i>Biological:</i> overfishing, collapse, extinction, rebuild, discard, bycatch | <i>Habitat:</i> protection, damage, habitat, environment | N/A |
| Economic Impacts | <i>Jobs:</i> access, unemployment, employment, livelihood, participation, consolidation, jobs | <i>Cost:</i> price, value, profit, sell, buy, boom, bust, cost | <i>Tourism:</i> charters, vacation, tourism |
| Stock Research | <i>Data:</i> assessment, science, transparency, collection, information, evidence, data | N/A | N/A |
| Stakeholder Relationships | <i>Nonprofit Influence:</i> nonprofit, Pew, EDF | <i>Recreational vs. Commercial:</i> mixed, sector, trawlers, longliners | <i>Managers:</i> trust, honest, dishonest, lies, exclusion, voting, communication |
| Management Methods | <i>Traditional:</i> bag, gear, seasons, size, limit, ban | <i>Catch Shares:</i> closure, quota, owner, shares, transfer, TAC, Annual Catch Limit, rights property | N/A |

Chapter 6: Results and Discussion

Results

Results of the “in favor” and “against” comment analysis are summarized in Table 2 on page 34, followed by the thematic analysis results in Appendix C. The results of the thematic analysis of stakeholder groups for the Golden Crab Amendment 6, Snapper Grouper Amendment 21, and Wreckfish Amendment 20A are summarized in Tables 3-5, respectively. Each of the tables is organized based on the percentage of comments that expressed a certain opinion of catch shares or presented a specific subtheme. For example, four out of seven Golden Crab fishermen expressed that they were against catch shares, so the table shows that 57% of Golden Crab fishermen are against catch shares; or two out of four Golden Crab fishermen that were against catch shares, 50%, indicated concern about biological factors.

Only eleven comments were submitted for the Golden Crab amendment, the low number of comments is likely explained by the fact that the Golden Crab fishery is relatively small and localized when compared to the Snapper Grouper fishery. An analysis of the comments showed that only a small majority of fishermen were against the amendment. Only one government official submitted a comment, and that comment expressed a disapproval of catch shares as a management mechanism. All of the stakeholders identifying themselves as managers or committee members were in support of catch shares. Finally, majority of the comments submitted by nonprofits were in

support of the amendment. The number of comments made by nonprofits was considerably more than any other stakeholder group.

With a total of 3,493 comments, the Snapper Grouper Amendment 21 received the most comments, likely because the fishery complex consists of numerous commercial and recreationally important species involving a large number of fishermen. Analysis of Snapper Grouper amendment comments revealed that a majority of stakeholders with a financial stake in the fishery (fishermen and industry workers), as well as those identifying themselves as managers, opposed Amendment 21. Government officials and nonprofits, on the other hand, were in support of the amendment. As with Golden Crab, nonprofits submitted significantly more comments than any other stakeholder group.

The Wreckfish Amendment 20A received the fewest number of comments with only six stakeholders voicing their opinions. The Wreckfish amendment addresses a catch share program (ITQs) that is already in place and, like the Golden Crab fishery, consists of only a small number of fishermen. The small number of comments makes it challenging to draw significant conclusions. With this limitation in mind, the data shows that Wreckfish fishermen are against the new amendment, while industry workers and two out of three nonprofits are in support of the new amendment that would revert inactive catch shares and the other nonprofit is against reversion because they feel the catch share program is detrimental to recreational fishermen.

Table 2. Distribution of Comments by Catch Share Opinion and Stakeholder Group

| | | % Against | % In Favor | Total |
|------------------------|------------|----------------------|-----------------------|--------------|
| Golden Crab | Fishermen | 57 | 43 | 7 |
| | Government | 100 | 0 | 1 |
| | Managers | 0 | 100 | 3 |
| | Nonprofits | 2 | 98 | 1046 |
| Snapper Grouper | Fishermen | 99 | 1 | 1172 |
| | Government | 0 | 100 | 1 |
| | Industry | 98 | 2 | 41 |
| | Managers | 100 | 0.00 | 2 |
| | Nonprofits | 3 | 97 | 2277 |
| Wreckfish | Fishermen | 100 | 0. | 1 |
| | Industry | 0 | 100 | 2 |
| | Nonprofits | 33 | 67 | 3 |

The results of the thematic analyses of stakeholder groups show that there is only minimal variation between different amendments and between different stakeholders. Golden Crab stakeholders that support catch shares discussed catch share specifics, species, and jobs. Golden Crab stakeholders against catch shares discussed jobs, traditional management, and the specifics of catch shares. Snapper Grouper stakeholders in favor of catch shares discussed jobs, relationships with managers, and the specifics of catch share programs. Those against catch shares discussed the data, the relationship between recreational and commercial fishermen, and the specifics of catch shares programs. Wreckfish stakeholders in favor of catch shares discussed the data, relationships with managers and traditional management. Those against discussed all of the five themes.

In order to illustrate properly how stakeholders are discussing each of these themes, direct quotes will be presented throughout the results section. It is important to keep in mind that because the Golden Crab amendment and Wreckfish amendment received so few comments, the percentages are higher than the Snapper Grouper fishery.

Golden Crab Comments

Keeping this fact in mind, within the Golden Crab fishery, fishermen who were against catch shares primarily discussed how catch shares would impact the economy, especially in relationship to job loss (75%) and the financial cost of the program as a result of having to buy shares or a decrease in the value of fish (75%). For example, one Golden Crab fishermen stated that:

“I also just wanted to mention that although some of the permits that were leased had received some lands and held some value; some of us has purchased permits with NO lands and are now wondering as to how we are going to survive. I personally have lost a home as a result of this fishery when I started, and now I can see myself having to deal with another loss – what do I do with a boat and no permit?”

Similar to Golden Crab fishermen, the government official, who was against the amendment, also focused their comments on the economic impacts of catch shares including the effect it would have on local jobs and tourism. Unlike fishermen, he did not focus on the possible financial costs of catch shares.

“The current process often fails to consider the unintended consequences resulting in a disastrous impact on many individuals and businesses, such as those commercial and recreational fishermen who may be put out of business.”

Golden Crab managers and nonprofits that were in support of the amendment addressed themes that were surprisingly similar to those of the fishermen and the government official that were against the amendment. Specifically, all stakeholders focused on the economic aspects of catch shares such as the effect on jobs, cost of being a fishermen, and tourism. Unlike the fishermen and government officials, managers and nonprofits discussed the impact the amendment would have on the environment (two out of three and 99.61%, respectively). Nonprofits also mentioned the relationship between managers and fishermen (93.87%).

“Golden Crab Management objectives: Prevent overfishing of golden crab by preventing the fishing mortality rate from exceeding the fishing mortality rate that would produce maximum sustainable yield (Fmsy).”

“Catch shares will end overfishing and rebuild fisheries, while stabilizing good jobs, improving local seafood availability and contributing to our local economy. These actions should be a top priority for the Council.”

Snapper Grouper Comments

The results of the Snapper Grouper analysis were very similar to the results of the Golden Crab analysis. Like Golden Crab fishermen, Snapper grouper fishermen who were against the amendment most frequently discussed how the economy would be impacted as a result of job loss and costs, 75% each, but were relatively unconcerned with tourism impacts (12.08%).

“I come from a community where catch shares was implemented. All of your fishermen, what they’re saying to you, they’re correct, 100 percent correct. There will be less jobs, loss of opportunity and consolidation will happen in the remaining fishery until the rights to fish are held by very few. “

Unlike Golden Crab fishermen, Snapper Grouper fishermen were also concerned with the science and data being used to create these regulations (93.62%).

“The SAFMC/NMFS has failed in the basic data and science of fisheries management, and should be restrained from enacting any new initiatives or management policies until they demonstrate core competencies in data collection and science.”

Finally, fishermen commonly discussed the relationship between commercial and recreational fishermen (93.87%).

“SO how can you propose ANY more restrictions on recreational anglers without first STOPPING commercial fishing of these and all other species?”

Industry workers were also especially concerned about the impact the amendment would have on the economy via jobs (75%) and cost (65%), as well as the science and data being used to support catch shares (72.5%). However industry workers were less concerned about the relationship between recreational and commercial sectors (57.5%).

“If anglers can no longer catch these fish, eventually there will be no reason to have repair shops because the anglers will stop going out.”

“The SAFMC has admitted they have flawed data, yet the government continues to allow these closures to take place with this data.”

While only two managers submitted comments on the Snapper Grouper amendment they managed to discuss all of the themes and subthemes, with a particular focus on science and data, and stakeholder relationships.

“I think that you could fix a lot of these problems that we’re seeing, if we had the data instead of using the data that’s not there.”

“And I’m here to stay that with the exception of two votes, both from NGOs, they were the only ones that were interested in continuing the conversation with catch shares.”

The government official and nonprofits were similar: they were in both in support of the Snapper Grouper amendment and discussed many of the things that those against the amendment discussed including impact on the economy in relation to jobs and stakeholder relationships in relation to how stakeholders interact with managers (one out of one and 99.86% respectively). Additionally, nonprofits discussed the impact the amendment would have on the environment, particularly involving the success of biological (99.59%) as opposed to habitat protection (0.36%). The comment by the government official also brought up the issue of science and data.

“The Frank-Jones amendment [preventing catch share development] will only serve to accelerate that decline costing our local economies tens of millions of dollars in lost jobs and revenues.”

“Catch shares will end overfishing and rebuild fisheries, while stabilizing good jobs, improving local seafood availability and contributing to our local economy.”

Wreckfish Amendment Comments

Finally, those stakeholders discussing the Wreckfish amendment (n = 6) managed to discuss the all five themes (nine subthemes). The fisherman who was against the

amendment discussed the impact on the environment and economy, specifically biological aspects, and the impact on jobs, as well as issues relating to the science available and finally the relationship between fishermen and managers. Similarly, those in the industry and nonprofits that were supportive of the amendment discussed the impact on jobs (one out of two and two out of two respectively), science (one out of two each) and relationship with managers (one out of two each). For example, the following two comments illustrate how those against catch shares feel about the Council (stakeholder relationships):

“[The Council] destroyed [the Wreckfish] fishery with catch shares before it ever really got started. This gross incompetence has caused fishermen to put more pressure on the shallow water fisheries.”

“One serious concern we have is the AP panels recommendation of eliminating the ITQ program! This is not a reflection of industry opinion, an AP panel needs to reach out to fishermen prior to making such a monumental recommendation. I urge council to look into their other recommendations and make sure they reflect the needs and opinions of the men they represent.”

The comment below illustrates how Wreckfish stakeholders in support of the catch shares feel the ITQ program has improved the cost of fishing:

“For 18 years this fishery has been humming along smoothly, a paragon of how successfully a catch share program can work. It is touted by many, even the Monterey Bay Aquarium, as an excellent example of how to best manage fisheries for sustainability and profit.”

It is important to mention that for all of the stakeholder groups, the majority of the comments for all amendments discussed specifics of traditional management and catch share management. This indicates a preference for or against traditional management. This also indicates that many stakeholders may have issues with specific aspects of the catch share amendment as opposed to the amendment as a method of management. A more in-depth analysis would be necessary to tease out these patterns.

Also, the weight of the nonprofit sector is given in this study due to the number of comments submitted may be disproportionate due to the method in which the Environmental Defense Fund (EDF) submits comments. EDF encourages all of their members to submit comments on catch share amendments, often times by allowing them to submit a form letter directly available from their website (which can be edited should an individual choose to do so). This allows EDF to submit a large number of comments on their behalf quickly.

Discussion

The results of the thematic analysis identified some interesting patterns concerning stakeholder opinions of catch share programs. First, specifics of catch share management (such as eligibility, allocation and cost recovery measures) were discussed throughout all amendments and all stakeholder groups. This may indicate that the subthemes within the broader management theme were too general to specify what really concerns stakeholders when it comes to the specific regulations involved in catch shares.

Second, the economy emerged as an important theme across all amendments and all stakeholder groups regardless of whether the group was in favor of catch shares or against catch shares. Knowing that the economy is the most important factor to all stakeholders will allow the Council to frame that catch share discussion in a way that will be meaningful to the stakeholders involved. Literature has shown that how environmental issues are framed has the ability to influence greatly how an individual deals with an issue and even their competency (Bardell, 1991). By properly framing catch share regulation, it is possible that the Council will be able to help reduce resistance to catch share implementation.

When it comes to framing, it is also important to note the few discrepancies between the themes that stakeholders discuss. In particular, those already in support of catch shares, especially nonprofits, tend to discuss the environmental impacts more than those who are not in support of catch shares. Also, those against catch shares focus on the science and data that is available and its validity, whereas those in support of catch shares do not often mention this theme. Finally, the Snapper Grouper stakeholders were more concerned about the impact catch shares would have on tourism than any stakeholders from the other two amendments.

Fourth, it is interesting to note that the economy, and in particular the issue of jobs and cost, was a theme not only discussed between all amendments and all stakeholders, but also by both those who are in favor of catch shares and those who are against catch shares. This means that some stakeholders believe that catch shares will harm the economy, resulting in job loss and increase costs to fishermen, at the same time as other stakeholders believe that catch shares will stabilize and even improve the economy, resulting in more profits for fishermen and their communities. This overlapping pattern is consistent for all three of the catch share amendments. This could illustrate that there is a fundamental lack of understanding of catch share programs across stakeholder groups. It is possible that this is due to a lack of social capital between the Council and fishery stakeholders.

The idea that social capital is low is supported by the fifth important finding: the theme of stakeholder relationships, especially with fisheries managers, was present across all amendments and stakeholder groups. This indicates that stakeholders feel there is little social capital between them and managers. As shown in the methods chapter, the

keywords used to identify stakeholder relationships with managers included: trust, dishonest, honest, lies, exclusion, voting, and communication, all important aspects of the social capital that are necessary for effective relationships and thus effective management.

These results provide a number of implications for fisheries' management. Past study results have shown that increasing stakeholder participation in the development of catch share programs can help increase their understanding of the regulations and improve the efficiency of rule-making (Carolan, 2006; GAO, 2006; Neis et. al., 1999). In conjunction with increasing efficiency, more stakeholder communication, especially between fishermen and scientists, would help increase the faith stakeholders have in the data being used to develop fisheries management plans. Finally, an increase in communication between stakeholders and managers could help improve the level of social capital (GAO, 2006).

Fisheries Management Implications

Collaborative fisheries management may be the solution that SAFMC needs to help increase the implementation of catch share amendments. The ultimate goal of collaborative management is to create sound methods and techniques for data collection while involving the expertise of all the stakeholders involved (Kaplan & McCay, 2004). This goal can also be extended to include addressing what research techniques have failed and why, as well as seeking out new resources (Pilling & Payne, 2008). This will include all of the stakeholders discussed in this paper: fishermen, fisheries managers, government officials, industry workers, nonprofits, and natural and social scientists. Fishermen have a working knowledge of things like fish migration patterns, spawning

grounds, juvenile habitats, schooling behavior, habitat preferences, and morphological differences between different locations (Johnson & VanDensen, 2007). Along with fishermen, social scientists need to be involved from the beginning of the management process as well. Social scientists can help to create an understanding of how management practices are going to affect the local community. They also will be able to look at the social, economic, and cultural aspects of the community. If the knowledge social scientists gain is shared with the other stakeholders, particularly natural scientists, fisheries managers, and government officials, there will hopefully be an increase in understanding between the two groups which will help increase communication (Kaplan & McCay, 2004). Natural scientists need to be involved because fish stock assessments are inherently complex and challenging to understand fully. Fish stocks will often vary both spatially and temporally, and how they vary will change depending on the species of fish being investigated. Because of these natural variations in fish stocks, observations by fisherman often don't match the scientific reports presented to fisheries managers. This is likely the cause of the great amount of distrust between fishermen, scientists, and managers. This distrust will ultimately cause a breakdown in fisheries' management because the fisherman will put substantial pressure on the fishery managers who will likely succumb to the pressure and begin overlooking and not implementing regulations leading to overfishing (Johnson & VanDensen, 2007). Snapper Grouper Amendment 21 is a great example of this process. Theoretically, collaborative management will increase communication between stakeholder groups which will in turn increase trust, preventing the above scenario from happening repeatedly (Kaplan & McCay, 2004).

Specifically, cooperative research initiatives might greatly improve stakeholder relationships and improve upon the common stakeholder perception that the scientific methodology and resulting data being used to implement fisheries' management plans are incorrect. Joint research initiatives include such practices as government scientists using fishing vessels and their crews to conduct fish stock assessments as well as conducting side-by-side research with fisherman. There are two major benefits of cooperative research. The first is that it will increase the trust between fisherman and scientists. Fisherman being able to contribute to the research and to use their expertise as well as have a say in the data collection techniques used to assess the fish stocks will increase their faith in the scientific data that is used to create regulations. This increase in faith will ultimately increase compliance and maybe even support for fishing regulations. The second benefit of cooperative research is that it makes the research techniques used very transparent and put them under intense scrutiny, especially from fisherman. Ultimately, this will result in better data collection techniques, which will allow for more reliable fish stock assessments, which will lead to better regulations and better marine policies (Kaplan & McCay, 2004).

There are, however, limitations to the theory of collaborative management and institutions that would need to be set up, primarily by the government, to help facilitate the management process. There are currently no specific rules or regulations or any type of governing body that makes a decision on representation in collaborative management. With no clear way of choosing representatives and no body that makes a final decision on representation, there are bound to be disagreements. Most commonly, this will lead to fisherman feeling as though they are not getting enough representation in the

management process or that their opinions and expertise are not being taken into account by the rest of the stakeholders. These feelings, whether they are justified or simply imagined based on perceptions of stakeholders, have the potential to hinder the management process. They will result in poor communication among stakeholders, will decrease morale and trust, and ultimately will lead to poor progress in managing the fisheries (Kaplan & McCay, 2004).

This can already be seen in the SAFMC. While the numerous committees typically include a wide range of stakeholders including fishermen, nonprofits and government officials, there are still stakeholders who feel they are being underrepresented or other are being overrepresented. For example, fishermen have voiced the concern that nonprofit organizations such as EDF and the Pew Environmental Group are being overrepresented when discussing catch share amendment decisions. Another example is that recreational fishermen feel that commercial fishermen carry more weight in the Council than is appropriate. Addressing the relationship issues between stakeholder groups will be the first step SAFMC will have to take to implement collaborative management and, more importantly, collaborative research methods

Chapter 7: Conclusion

The goal of this thesis was to identify what the biggest concerns stakeholders held about catch shares and how those concerns differed between stakeholder groups. Results showed that those with a financial stake in the industry were typically against catch share programs, whereas nonprofits were typically in favor of catch share programs. Themes being discussed did not vary significantly between stakeholder groups, indicating confusion over the possible costs and benefits of catch share programs. These results could have implications for how the South Atlantic Fishery Management Council should go about implementing catch share programs. It was recommended that the Council partake in more collaborative management, particularly in the form of joint-research initiatives.

However, this thesis was not without shortcomings. Keyword analyses are inherently challenging. It is possible that the keyword analysis missed key themes that should have been identified as an important part of the analysis. Also, thematic analyses have the negative aspect of being too broad. While the five key themes and resulting subthemes attempted to investigate thoroughly the opinions of the stakeholder groups, it is likely that there were some important subtleties that were missed.

As a result, this topic would benefit greatly from continued research, especially through more direct means of communication with stakeholders such as surveys and even better, interviews. This type of research would be able to pick up important factors that this thematic analysis may have missed. For example, this research also indicated the

importance of specific aspects of traditional management and catch share management such as a preference for bag and gear limits over catch shares or concerns about the appeals process or cost recovery plans involved with catch share programs. While this research study simply identified their importance, a more in-depth research study would be able to identify the specific actions and alternatives that were affecting the perceptions stakeholders had concerning catch shares. Understanding these key points could help managers write policies in a way that would appeal more to stakeholders.

Finally, a next step after this research could be to compare the South Atlantic Fishery Management Council's attempts to implement catch share programs to other councils' attempts, such as the Gulf of Mexico Fishery Management Council's efforts. This could provide valuable insight into how stakeholder opinions vary between the two councils as well as how the process of implementing catch share amendments differs. Overall, this study has shown the importance of the economy, scientific data, and relationships to stakeholders in the South Atlantic region. It is argued that improving communication between stakeholders via methods such as increased collaborative management and implementation of collaborative research initiatives is necessary to increase the success of proposed catch share amendments

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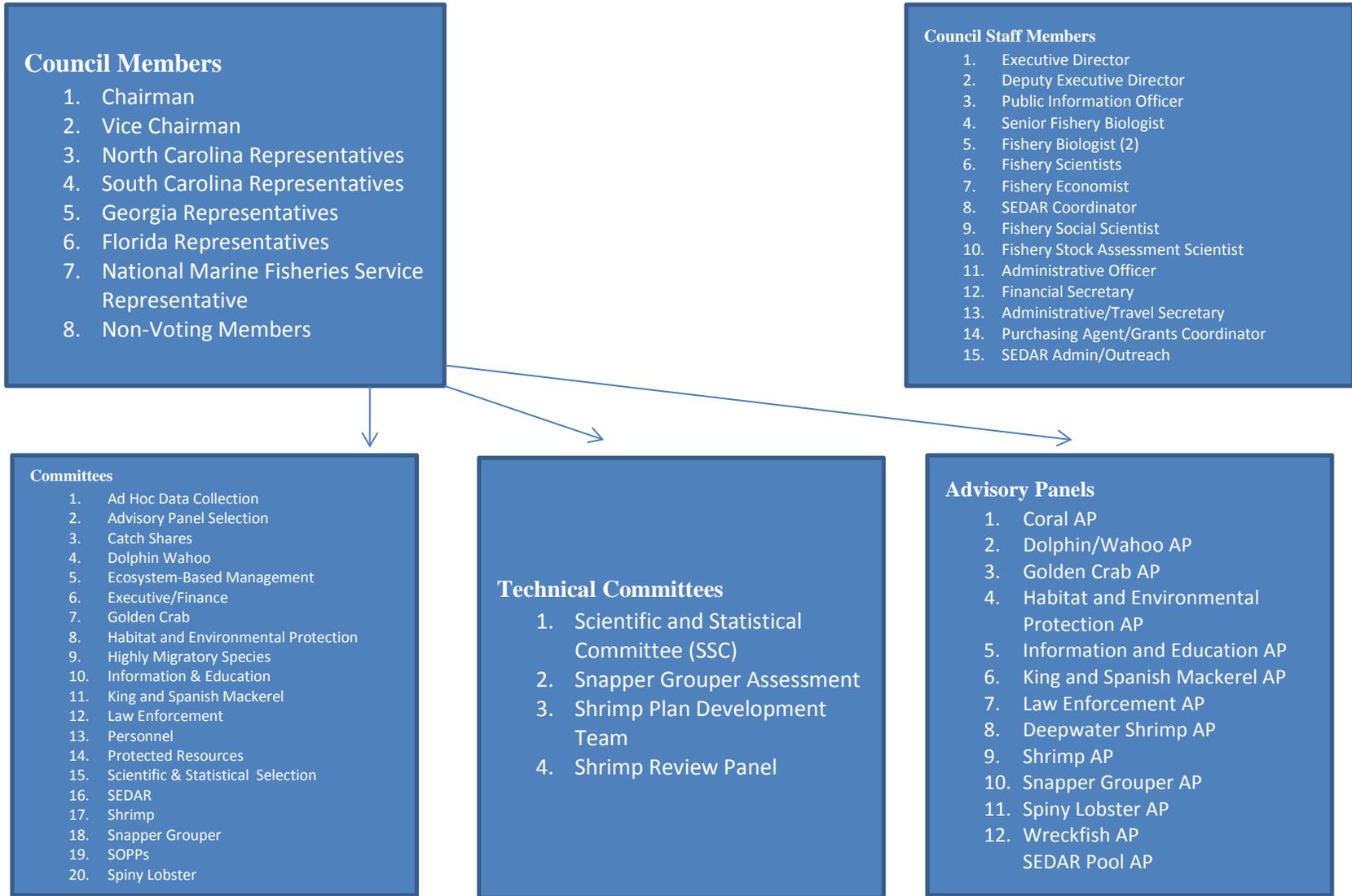
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Appendix A. Diagram of the South Atlantic Fishery Management Council



Appendix B. Summary of Amendment Actions and Alternatives

Table 3. Actions and alternatives for Amendment 20A to the Snapper Grouper FMP (Wreckfish). For more information see: South Atlantic Fishery Management Council. (2011). *Amendment 20A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Environmental Assessment, Regulatory Flexibility Act Analysis, Regulatory Impact Review, and Fishery Impact Statement.* Retrieved from SAFMC website: www.safmc.net.

| Action | Alternative One | Alternative Two | Alternative Three | Alternative Four | Alternative Five | Alternative Six |
|--|--|--|--|---|---|---|
| One: Define and revert inactive shares. | No Action. Do not define or revert inactive shares for redistribution. | Define inactive shares as shares belonging to any ITQ shareholder who has not reported wreckfish landings between April 16, 2009, and January 14, 2011, and revert inactive shares for redistribution among active shareholders. | Define inactive shares as shares belonging to any ITQ shareholder who has not reported wreckfish landings between April 16, 2006, and January 14, 2011, and revert inactive shares for redistribution among active shareholders. | N/A | N/A | N/A |
| Two: Redistribution | No Action. Do not redistribute reverted shares. | Redistribute reverted shares to remaining shareholders based on 50% equal allocation + 50% landings history. | Redistribute reverted shares to remaining shareholders based on landings history. | Redistribute reverted shares based on proportion of remaining shares held by each remaining shareholder after inactive shares are reverted. | N/A | N/A |
| Three: Share Cap | No Action. Do not establish a share cap. | Establish a share cap as 15% of the total shares. | Establish a share cap as 25% of the total shares. | Establish a share cap as 49% of the total shares. | Establish a share cap as 65% of the total shares. | Establish a share cap as the percentage of total shares held by the largest shareholder after redistribution. |
| Four: Appeals Process | No Action. Do not specify provisions for an appeals process associated with the ITQ program. | A percentage of the wreckfish shares for fishing year will be set-aside to resolve appeals. | A percentage of the wreckfish shares for fishing year will be set-aside to resolve appeals. | N/A | N/A | N/A |

Table 4. Actions and alternatives for Amendment 21 to the Snapper Grouper FMP. For more information see: South Atlantic Fishery Management Council. (2011). *Scoping document for Amendment 21 to the fishery management plan for the Snapper Grouper Fishery of the South Atlantic region*. Retrieved from SAFMC website: www.safmc.net.

| Action | Alternative One | Alternative Two | Alternative Three | Alternative Four | Alternative Five | Alternative Six | Alternative Seven |
|--|--|--|--|---|--|--|--|
| One: Selection of an effort management. | No action. Do not change management regime of one or more snapper grouper species. | Establish trip limits for one or more snapper grouper species. | Establish an endorsement program for one or snapper grouper species. | Establish quotas for the snapper grouper fishery. | Implement rules for establishing cooperatives for one or more snapper grouper species. | Establish TURFs for one or more snapper grouper species. | Establish catch share program for one or more snapper grouper species. |
| Two: Selection of species. | No action—Do not establish LAP programs for snapper grouper species in the South Atlantic. | Establish a LAP program for one or more species. | N/A | N/A | N/A | N/A | N/A |
| Three: Establish trip limits. | No Action. Do not establish trip limits. | Establish trip limits for one or more snapper grouper species. | N/A | N/A | N/A | N/A | N/A |
| Four: Initial allocation of endorsements. | No action. Do not allocate endorsements. | Allocate endorsements based on average annual landings during the qualifying years for all snapper grouper stocks of a certain poundage. | N/A | N/A | N/A | N/A | N/A |
| Five: Establish state-by-state quotas. | No action. Do not establish state-by-state quotas. | Establish state-by-state quotas using historical landings data. | N/A | N/A | N/A | N/A | N/A |

Table 4. Actions and alternatives for Amendment 21 to the Snapper Grouper FMP.

| | | | | | | | |
|-----------------------------------|--|--|---|---|---|-----|-----|
| Six: Establish regional quotas. | Do not establish regional quotas. | Establish regional quotas for NC-SC, GA-northern Florida, and southern Florida | Establish regional quotas for NC, SC-GA, northern Florida, and southern Florida | Establish regional quotas for NC, SC, GA-northern Florida, and southern Florida | Establish regional quotas for NC, SC-GA, Florida north and south of Monroe/Dade line. | N/A | N/A |
| Seven: Set aside for research. | No action. Do not set aside annual pounds for research or an experimental fishery. | Set aside a total of X percent of the current commercial quota for a share category for research or an experimental fishery. | Set aside a total of Y percent of the current commercial quota for a share category would be set aside to for research or an experimental fishery. | N/A | N/A | N/A | N/A |
| Eight: Catch share participation. | Do not establish criteria for participating in a catch share program for South Atlantic snapper-grouper species. | Participation would be mandatory for fishermen harvesting catch share managed species. | Participation would be mandatory for fishermen harvesting catch share managed species if a majority of eligible fishermen approve implementation of the catch share program through referendum. | 4: Initial participation would be voluntary for fishermen harvesting catch share managed species. Prior to the start of the catch share program, fishermen could decide whether or not they would like to participate in the catch share program. | N/A | N/A | N/A |
| Action Nine: Define participants. | No action. Do not identify substantial participants. | Identify commercial snapper grouper permit holders as substantial participants | Identify commercial snapper-grouper permit holders, vessel owners, captains, and crew as substantial participants. | Identify U.S. citizens and U.S. permanent resident aliens as substantial participants. | N/A | N/A | N/A |

Table 4. Actions and alternatives for Amendment 21 to the Snapper Grouper FMP.

| | | | | | | | |
|----------------------------------|--|---|---|---|---|--|--|
| Ten: Eligibility. | No action. Do not specify initial allocation eligibility requirements. | Restrict eligibility to valid commercial snapper grouper permit holders. | Restrict eligibility to valid commercial snapper grouper permit holders and snapper grouper captains and crew. | Restrict eligibility to valid commercial snapper grouper permit holders and federally permitted snapper grouper dealers. | Restrict eligibility to valid commercial snapper grouper permit holders, permitted snapper grouper dealers and snapper grouper captains and crew members. | Restrict eligibility to based on a minimum percentage of the quota shares. | Restrict eligibility based on catch history. |
| Eleven: Initial apportionment. | No action. Do not specify a method for the initial allocation of LAPs. | Distribute shares proportionately among eligible participants of a catch share program based on average annual landings from logbooks associated with current snapper grouper permits during a particular time period | Distribute catch shares proportionately among eligible participants based on average annual landings from logbooks associated with current snapper grouper limited access permit holders during the time period with an allowance of dropping one year. | Distribute X% of catch shares equally among eligible participants and distribute the remaining X% of catch shares based on average annual landings from logbooks associated with current snapper grouper limited access permit holders during the time period 1998 to 2005, with an allowance of dropping one year. | Distribute catch shares through an auction system. All eligible entities under Action 3 would be allowed to place bids. | Distribute initial allocation using tiers | N/A |
| Twelve: Multiuse trip allowance. | Do not establish multiuse annual pounds or trip allowances. | Establish multiuse annual pounds or trip allowances. | N/A | N/A | N/A | N/A | N/A |

Table 4. Actions and alternatives for Amendment 21 to the Snapper Grouper FMP.

| | | | | | | | |
|--|--|--|---|---|---|---|-----|
| Thirteen: Transferability of shares and annual pounds. | No action. Do not allow transferability of shares. | Allow shares to be transferred between owners of snapper grouper permits. | Allow shares to be transferred between persons identified as substantial participants. | Allow shares to be transferred between <i>unlimited</i> commercial snapper grouper permit holders. Quota share would be reallocated to new entrants when a permit holder passes away. | Allow shares to be transferred between <i>unlimited</i> commercial permit holders. Quota share would be reallocated to unlimited quota shareholders when a permit holder passes away. | Allow shares to be transferred between <i>unlimited</i> commercial permit holders. Quota share would be reallocated to unlimited quota holders and new entrants when a permit holder passes away. | |
| Fourteen: Transferability of annual pounds. | No action. Do not allow transferability of annual pounds. | Allow annual pounds to be transferred between owners of snapper grouper permits. | Allow annual pounds to be transferred between owners of snapper grouper <i>unlimited</i> permits. | Allow pounds to be transferred between substantial participants. | N/A | N/A | N/A |
| Fifteen: Establish caps on shares ownership. | No action. Do not establish ownership caps for each species or species grouping. | Establish a cap on share ownership. Anyone receiving shares that were less than the share cap could purchase additional shares up to that amount of the share cap. | No person shall own more catch shares than the maximum percentage issued to the recipient of the largest amount of shares at the time of initial assignment of shares for a share category. | N/A | N/A | N/A | N/A |
| Sixteen: Establish caps on pounds ownership. | No action. Do not establish a cap on catch share annual pounds ownership. | For each species, establish a cap on the annual pounds corresponding to the share cap as defined in Action 10, times commercial quota. | No person shall possess more than the maximum pounds issued to the recipient of the largest amount of pounds at the time | N/A | N/A | N/A | N/A |

Table 4. Actions and alternatives for Amendment 21 to the Snapper Grouper FMP.

| | | | | | | | |
|---|--|--|--|-----|-----|-----|-----|
| Seventeen: Adjustment of annual pounds. | No action. Do not specify how annual pounds are allocated when there is a change in the commercial quota. | Distribute annual pounds proportionally among shareholders, made available due to an increase or decrease in commercial quota based on share holding. | Distribute annual pounds equally among shareholders, made available due to and increase or decrease in commercial quota. | N/A | N/A | N/A | N/A |
| Eighteen: Incidental catch provisions. | No action. Do not allow incidental catch amounts for snapper grouper species for fishermen who do not hold shares. | Allow incidental catch amounts for a snapper grouper species for fishermen who do not hold share. | N/A | N/A | N/A | N/A | N/A |
| Nineteen: Allow banking. | No action. Do not allow catch share holders to bank unused amounts of pounds or X percentage of unused annual pounds for use in the subsequent year. | Allow banking of unused amounts of annual pounds for use in the subsequent fishing year. | Allow banking of unused amounts of annual pounds for use in the subsequent fishing year. | N/A | N/A | N/A | N/A |
| Twenty: Allow borrowing. | No action. Do not allow borrowing of any future year's annual pounds. | Allow shareholders limited borrowing of a subsequent year's pounds. After exhausting an individual's annual pounds, the shareholder is allowed to borrow pounds from the following year. | Allow shareholders to borrow up to 10 percent of remaining allocation on the last trip of the year. The overage is taken off next year's allocation. | N/A | N/A | N/A | N/A |

Table 4. Actions and alternatives for Amendment 21 to the Snapper Grouper FMP.

| | | | | | | | |
|---|---|---|---|--|--|--|--|
| Twenty One: Appeals process. | No action. Do not establish an appeals process for fishermen who believes they were omitted from the catch share program or not been allocated the correct amount of shares based on eligibility criteria described for a catch share category. | Establish an appeals process. | N/A | N/A | N/A | N/A | N/A |
| Twenty Two: Set aside for appeals. | No action. Do not set aside a portion of the commercial quota for appeals. | Set aside a total of X percent of the current commercial quota to resolve appeals. | Set aside a total of Y percent of the current commercial quota to resolve appeals. | N/A | N/A | N/A | N/A |
| Twenty Three: Use it or lose it. | No action. Do not specify a minimum landings requirement for retaining catch shares | Revoke shares that remain inactive for three years and redistribute them proportionally among remaining shareholders (30%). | Revoke shares that remain inactive for three years and redistribute them proportionally among remaining shareholders (50%). | Revoke shares that remain inactive for X years and redistribute them proportionally among remaining shareholders (A%). | Revoke shares that remain inactive for Y years and redistribute them proportionally among remaining shareholders (A%). | Revoke shares that remain inactive for X years and redistribute them proportionally among remaining shareholders (B%). | Revoke shares that remain inactive for Y years and redistribute them proportionally among remaining shareholders (B%). |
| Twenty Four: Cost recovery plan. | No action. Do not establish a cost recovery plan. | Implement catch share cost recovery plans for catch share categories. | N/A | N/A | N/A | N/A | N/A |
| Twenty Five: Collection of royalties. | No action. Do not collect royalties from shareholders for use in the snapper grouper fishery. | Hold an annual auction of portions of the shares in the snapper grouper fishery. | Collect royalties from shareholders through an annual fee. | N/A | N/A | N/A | N/A |

Table 4. Actions and alternatives for Amendment 21 to the Snapper Grouper FMP.

| | | | | | | | |
|--|---|---|---|---|-----|-----|-----|
| Twenty Six: New entrants loan program. | No action. Do not create a loan program to assist new fishermen in entering a catch share program. | Set aside X % of the commercial quota each year to give some <i>permit holders</i> that did not receive shares the opportunity to become shareholders. | Set aside X % of the commercial quota each year to give some <i>fishermen that did not receive shares</i> the opportunity to become shareholders. | N/A | N/A | N/A | N/A |
| Twenty Seven: Approved landing sites. | No action. Do not establish approved landing sites for catch share managed snapper-grouper species. | Establish approved landing sites. All catch share owners must land at one of these sites to participate in the catch share program. | N/A | N/A | N/A | N/A | N/A |
| Twenty Eight: Expiration provision. | No action. Do not define an expiration provision for the catch share program(s). | Define shares so they expire every 5 years with a start date upon implementation of this Amendment. | Define shares so they expire every 10 years with a start date upon implementation of this Amendment. | Define shares so they expire every X number of years with a start date upon implementation of this Amendment. | N/A | N/A | N/A |
| Twenty Nine: VMS Requirement | No action. Do not require commercial snapper grouper vessels to be equipped with vessel monitoring systems (VMS). | Require all commercial vessels to be equipped with VMS. The purchase, installation and maintenance of VMS equipment must conform to the protocol established by NOAA Fisheries Service. | N/A | N/A | N/A | N/A | N/A |

Table 5. Actions and alternatives for Amendment 6 to the Golden Crab FMP. For more information see: South Atlantic Fisheries Management Council. (2012). Amendment 6 to the Fishery Management Plan for the Gold Crab Fishery of the South Atlantic Region. Retrieved from SAFMC website: www.safmc.net.

| Action | Alternative One | Alternative Two | Alternative Three | Alternative Four | Alternative Five | Alternative Six | Alternative Seven |
|-----------------------------|---|--|--|---|---|---|---|
| One: Establish eligibility. | Do not establish eligibility criteria for a golden crab catch share program | Restrict eligibility to valid or renewable commercial golden crab permit holders who have made landings of 1 pound or greater from 2001 through 2010. | Restrict eligibility to valid or renewable commercial golden crab permit holders who have made landings of 1 pound or greater from 2005 through 2010. | Restrict eligibility to valid or renewable commercial golden crab permit holders. | N/A | N/A | N/A |
| Action Two: Apportionment. | Do not specify a method for initial apportionment of catch shares. | Distribute initial catch shares proportionately among eligible participants based on the aggregate annual golden crab landings from logbooks associated with their current permit(s) during the time period 2002 through 2010. | Distribute initial catch shares proportionately among eligible participants based on the aggregate annual golden crab landings from logbooks associated with their current permit(s) during the time period 1997 through 2010. | Distribute 50% of initial catch shares equally among eligible participants and distribute 50% of initial catch shares among eligible participants based on the aggregate annual golden crab landings from logbooks associated with their current permit(s) during the time period 1997 through 2010 | Distribute 25% of initial catch shares equally among eligible participants and distribute 75% of initial catch shares among eligible participants based on the aggregate annual golden crab landings from logbooks associated with their current permit(s) during the time period 1997 through 2010 | Distribute initial catch shares proportionately among eligible participants based on the best consecutive three year average of golden crab logbook landings associated with their current permit(s) during the time period 1997 through 2010 | Distribute initial apportionment of catch shares through an auction. All eligible entities as determined in Action 1 would be able to participate. |
| Three: Appeals process. | Do not specify provisions for an appeals process. | A % of the shares for the fishing year will be set-aside for appeals. | N/A | N/A | N/A | N/A | N/A |

Table 5. Actions and alternatives for Amendment 6 to the Golden Crab FMP.

| | | | | | | | |
|--------------------------------|--|--|--|---|---|-----|-----|
| Four: Transferability. | Do not establish criteria for transferability. | Shares or annual pounds can only be transferred to valid or renewable golden crab permit holders. Participants cannot possess shares or allocation without a valid or renewable golden crab permit. | Shares or annual pounds can only be transferred to valid and renewable golden crab permit holders during the first five years of the catch share program and all U.S. citizens and permanent resident aliens thereafter. Participants cannot possess shares or allocation without a valid or renewable golden crab permit. | N/A | N/A | N/A | N/A |
| Five: Share ownership caps. | Do not constrain the percentage of catch shares held by a person, including a corporation or other entity. | No person, including a corporation or other entity, may individually or collectively hold catch shares in excess of the maximum share initially issued to any person at the beginning of the catch shares program. | No person, including a corporation or other entity, may individually or collectively hold catch shares in excess of 25 percent of the total shares. | No person, including a corporation or other entity, may individually or collectively hold catch shares in excess of 35 percent of the total shares. | No person, including a corporation or other entity, may individually or collectively hold catch shares in excess of 49 percent of the total shares. | N/A | N/A |
| Six: Use it or lose it policy. | Do not specify a minimum landings requirement for retaining shares. | Shares that remain inactive for 3 consecutive years will be revoked and redistributed proportionally among the remaining shareholders | Shares that remain inactive for 3 consecutive years will be revoked and redistributed proportionally among the remaining shareholders. | Shares that remain inactive for 3 consecutive years will be revoked and redistributed among the remaining shareholders. | N/A | N/A | N/A |

Table 5. Actions and alternatives for Amendment 6 to the Golden Crab FMP.

| | | | | | | | |
|--|--|---|--|-------------------------------|-----|-----|-----|
| Seven: Cost recovery plan. | Do not implement a cost recovery plan. | Cost recovery fees would be calculated at time of sale at a registered dealer | Fee collection and submission is the responsibility of a) shareholder b) dealer | Fees submitted to NMFS | N/A | N/A | N/A |
| Eight: Revise boat length limit. | No Action. To obtain a permit for the middle or southern zone via transfer, the documented length overall of the replacement vessel may not exceed the documented length overall, or aggregate documented lengths overall, of the replaced vessel(s) by more than 20 percent. | Eliminate vessel length restrictions for obtaining a permit for the middle and southern zones via transfer. | To obtain a permit for the middle or southern zone via transfer, the documented length overall of the replacement vessel may not exceed the documented length overall, or aggregate documented lengths overall, of the replaced vessel(s) by more than 35 percent. | N/A | N/A | N/A | N/A |
| Nine: Modify regulation on fishing zones. | No Action. A vessel with a permit to fish for golden crab in the northern zone or the middle zone may fish only in that zone. | Participants can use annual pounds in any zone for which they possess a permit. | A vessel with a permit to fish golden crab can use annual pounds in any of the three golden crab fishing zones. | N/A | N/A | N/A | N/A |
| Ten: Modify the small vessel sub-zone restriction. | No Action. Do not modify the small vessel sub-zone restriction. | Eliminate the small vessel sub-zone within the southern zone that was originally established to protect against very large vessels fishing in the subzone | N/A | N/A | N/A | N/A | N/A |
| Eleven: Modify ‘one vessel, one permit’ policy. | Do not modify “one vessel, one permit” policy for golden crab. | Allow multiple permits to be issued to one vessel so that any zones can be fished in one trip. | N/A | N/A | N/A | N/A | N/A |

Table 5. Actions and alternatives for Amendment 6 to the Golden Crab FMP.

| | | | | | | | |
|---|--|--|--|-----|-----|-----|-----|
| Twelve: Monitoring and enforcement. | Do not require additional monitoring and enforcement. | Require all vessels engaged in the catch share program to be equipped with VMS. | N/A | N/A | N/A | N/A | N/A |
| Action Thirteen: Define ownership cap. | Do not identify annual pound ownership caps | Set the annual pounds cap equal to the corresponding share cap as defined in the “Define quota share ownership caps” action (Action 5) times the annual quota. | Set the annual pounds cap equal to the share cap specified in Action 5 plus a) 1% b) 5% c) 10% | N/A | N/A | N/A | N/A |
| Fourteen: Annual pounds overage. | Do not allow fishermen to exceed their allotted annual pounds. | A person on board a vessel with the shareholder’s only remaining golden crab annual pounds may exceed, by up to 10%, the shareholder’s annual pounds remaining on the last fishing trip of the year. | A person on board a vessel with the shareholder’s only remaining golden crab annual pounds may exceed, by up to 20%, the shareholder’s annual pounds remaining on the last fishing trip of the year. | N/A | N/A | N/A | N/A |
| Fifteen: Approved landing sites. | Do not establish approved landing sites for the golden crab catch share program. | Establish approved landing sites for the golden crab catch share program. All participants must land at an approved landing site to participate in the program | N/A | N/A | N/A | N/A | N/A |

Appendix C. Summary of thematic analysis results.

Table 6. Number of Golden Crab comments containing individual themes.

* Percentages used for n > 10 (x%), counts used for n < 10 (x/n)

| | Environment | | Economy | | | Science | Stakeholders | Management | | | |
|-------------------------------|-------------|---------|---------|------|---------|---------|---------------|------------|----------|-------------|--------------|
| | Biological | Habitat | Jobs | Cost | Tourism | Data | NPO Influence | Fishermen | Managers | Traditional | Catch Shares |
| Fishermen Against (4) | 2/4 | 1/4 | 3/4 | 3/4 | 0 | 0 | 1/4 | 0 | 1/4 | 1/4 | 3/4 |
| Fishermen For (3) | 1/3 | 2/3 | 2/3 | 1/3 | 0 | 0 | 0 | 0 | 0 | 0 | 2/3 |
| Government Against (1) | 0 | 0 | 1/1 | 0 | 1/1 | 0 | 0 | 0 | 0 | 1/1 | 0 |
| Managers For (3) | 2/3 | 2/3 | 0 | 2/3 | 0 | 1/3 | 0 | 0 | 0 | 1/3 | 0 |
| NPOs Against (22) | 86 | 0 | 86. | 0 | 27 | 77 | 5 | 59 | 95 | 68 | 100 |
| NPOs For (1024) | 100 | 0.2 | 99 | 0.29 | 99 | 0 | 0.1 | 0 | 100 | 0 | 100 |

Table 7. Number of Snapper Grouper comments containing individual themes.

* Percentages used for n > 10 (x%), counts used for n < 10 (x/n)

| | Environment | | Economy | | | Science | Stakeholders | Management | | | |
|---------------------------------|-------------|---------|---------|------|---------|---------|---------------|------------|----------|-------------|--------------|
| | Biological | Habitat | Jobs | Cost | Tourism | Data | NPO Influence | Fishermen | Managers | Traditional | Catch Shares |
| Fishermen Against (1159) | 93 | 7 | 94 | 93 | 12 | 93 | 2 | 94 | 8 | 10 | 95 |
| Fishermen For (13) | 8 | 0 | 15 | 8 | 0 | 23 | 0 | 15 | 0 | 8 | 23 |
| Government For (1) | 0 | 0 | 1/1 | 1/1 | 1/1 | 1/1 | 0 | 1/1 | 1/1 | 1/1 | 1/1 |
| Industry Against (40) | 63 | 15 | 76 | 65 | 40 | 73 | 0 | 58 | 20 | 83 | 85 |
| Industry For (1) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1/1 |
| Managers Against (2) | 2/2 | 1/2 | 1/2 | 2/2 | 1/2 | 2/2 | 1/2 | 2/2 | 2/2 | 2/2 | 2/2 |
| NPOs Against (61) | 74 | 7 | 72 | 5 | 23 | 67 | 8 | 55 | 79 | 59 | 87 |
| NPOs For (2277) | 100 | 0.36 | 99 | 0.5 | 99 | 0.27 | 0.18 | 0.14 | 100 | 0.23 | 100 |

Table 8. Number of Wreckfish comments containing individual themes.

* Percentages used for n > 10 (x%), counts used for n < 10 (x/n)

| | Environment | | Economy | | | Science | Stakeholders | Management | | | |
|------------------------------|-------------|---------|---------|------|---------|---------|---------------|------------|----------|-------------|--------------|
| | Biological | Habitat | Jobs | Cost | Tourism | Data | NPO Influence | Fishermen | Managers | Traditional | Catch Shares |
| Fishermen Against (1) | 1/1 | 0 | 1/1 | 0 | 0 | 1/1 | 0 | 0 | 1/1 | 0 | 1/1 |
| Industry For (2) | 0 | 0 | 1/2 | 0 | 0 | 1/2 | 0 | 0 | 1/2 | 0 | 1/2 |
| NPO Against (1) | 0 | 1/1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1/1 | 1/1 |
| NPO For (2) | 0 | 1/2 | 2/2 | 1/2 | 0 | 1/2 | 0 | 1/2 | 1/2 | 2/2 | 2/2 |

VITA

Christina Marie Wiegand was born in Asheville, North Carolina, in 1988. She started elementary school in Kalamazoo, Michigan, before moving to Corvallis, Oregon, where she completed the rest of elementary school, middle school, and part of high school. After moving to Holly Springs, North Carolina, Christina finished high school at Middle Creek High. She was accepted to the University of North Carolina-Wilmington and started attending in August 2006. She was awarded the Bachelor of Science Degree in Marine Biology in May of 2010. The following January, she enrolled at Appalachian State University and received her Master of Arts degree in Political Science with an Environmental Politics and Policy Analysis concentration in December of 2012. Christina has completed internships with the North Carolina Aquarium at Fort Fisher, National Council for Air and Stream Improvement, Inc.; Focus the Nation – Forums to Action; and Food & Water Watch.