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Commercial Fishers' Perspectives on Revitalizing the Fishing Industry in Coastal Georgia

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**Commercial Fishers' Perspectives on Revitalizing the
Fishing Industry in Coastal Georgia**

An Honors Thesis submitted in partial fulfillment of the requirements for Honors in
Anthropology

By
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Under the mentorship of Dr. Jennifer Sweeney Tookes

ABSTRACT

Competition from imported seafood, low product prices, increasing operation costs, and other socio-economic factors are negatively affecting coastal Georgia's commercial fishing industry. Fishers' local ecological knowledge (LEK) is extensive and gives them unique perspectives into the problems the industry is facing. Their perspectives differ from those of biologists or policymakers, making them useful for implementing good management policies that not only consider the scientific knowledge of a fishery, but the human aspect as well. This thesis used conducted semi-structured and card-sorting interviews with commercial Georgia fishermen in two fishing communities to learn about the problems they face and their unique insights into potential solutions. Overall, they perceived imports and shrimp (or product) price to be the most severe problems, and marketing to be the most helpful solution. Despite the problems they face, fishers that remain in Georgia's commercial fishing industry have proven to be extremely resilient, indicating that the future of Georgia's commercial fishing industry could have a long and successful future.

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Introduction

“I’m thinking in three or four years there’s not gon’ be very many boats here in Brunswick at all. There’s no young crowd coming along to kinda keep it going . . . They worry about the sharks or turtles being endangered, what’s really endangered to me is the commercial fishermen. I mean there’s less of us than anybody else that’s left in this business. And you see boats falling apart. There’s no new boats being made to replace old ones. I see it as being kind of a dying industry myself. It’s sad to say.”

— Peter*, a commercial shrimper

The sentiment expressed above is unfortunately a recurring one shared by many members of Georgia’s commercial fishing industry. As Peter indicates, shrimpers and other commercial fishers are contending with numerous problems. The number of commercial fishers has declined, but those who remain possess a wealth of knowledge about the industry, the environment in which they work, the problems they face, and the solutions that might help sustain their livelihoods and their industry.

Fisheries research has gathered many insights into the experiences of fishers, including problems fishers face, the cultural significance of fishing communities, fishers’ local ecological knowledge, fisheries management, and ultimately the story of resilience that encapsulates many fisheries (Blount 2017; Clay and Olson 2007; Berkes and Seixas 2005; Crosson 2012; Gatewood and McCay 1990; Pitchon 2011). As an in-depth extension of pilot research conducted in March of 2018, this thesis aims to gather information regarding coastal Georgia commercial fishers’ perspectives and insights on what they perceive as the most severe problems and the most helpful solutions.

Because the problems affecting the fishing industry affect the fishers themselves most directly, it is important to take their experiences, observations, and opinions into consideration when exploring potential solutions that would help revitalize and restore

*All names have been changed.

the fishing industries in coastal Georgia (Blount 2017). Fishers' experiences on the water are meaningful and give them a perspective unique from policy makers and scientists (Barclay et al. 2016; Maurstad 2002; Berkes and Seixas 2005; Griffith and Pizzini 2002). Therefore, listening to and recording the fishers' perspectives provided insights into the fishing industry and ways to better address these problems.

The data gleaned from the 18 interviews conducted as a part of this research and presented below revealed several findings. Participants included shrimpers, several of the University of Georgia's Sea Grant Marine Extension employees, a crabber, and a fish house manager. Several main themes emerged from these interviews. Firstly, while fishers still feel as if they are perceived by the public to be hurting the environment, they have become much more understanding of conservation efforts and regulations such as turtle excluder devices (TEDs) and bycatch reduction devices (BRDs). Their close relationship to the environment in which they work not only makes fishers inclined to protect it, but means they possess vast local ecological knowledge (LEK) that can help do so. However, despite their knowledge and acceptance of conservation, implementing effective and workable solutions continues to be a challenging and formidable task. Fishers also express feeling unsupported; this lack of support varied from instances both within the fishing community, as well as from the public and the government. Lastly, while some of the most severe problems fishers face are competition from imported seafood and low product prices (though how fishers perceive these problems differs by fishery and role in the industry), fishers remain resilient. Fishers' resilience can be seen through their survival, diversification, and optimism (Johnson, Henry, and Thompson 2014) and is indicative of a hopeful future in which the fishing industry will successfully

persist and adapt to future problems.

Literature Review

Some fishing industries in the United States are currently experiencing a multitude of problems that impact the industry and fishers' well-being and continued success and survival. While some fisheries are lucrative, this is not the case for all fisheries: competition from imported seafood and increasing operation costs coupled with relatively stagnant or decreasing fish prices paid by consumers are putting stress on some fishers and making it increasingly difficult to make a living through fishing (Clay and Olson 2007; Tookes, Barlett, and Yandle 2018; Pitchon 2011; Colburn, Abbott-Jamieson, and Clay 2006; Blount 2007; Maiolo 2004). Despite these and other problems, resilience exhibited by fishing communities is well-documented (Pitchon 2011; Blount 2007; Blythe 2015; Adger 2005; McConney, Cox, and Parsram 2015). Furthermore, fishing communities often develop their own cultural norms and behaviors that constitute a valuable source of cultural knowledge that is currently susceptible to disappearing if the fishing industry continues to decline. This makes their insights and contributions to fisheries management crucial for the industry's future. Fishers' capacity for resilience and extensive local ecological knowledge (LEK) (Pitchon 2011; Blount 2007; Blythe 2015; Adger 2005; McConney, Cox, and Parsram 2015; Maurstad 2002; Berkes and Seixas 2005; Griffith and Pizzini 2002) make fishers capable of providing useful knowledge and a unique perspective that could help solve the problems their fishery faces and improve fisheries management.

Fisheries management in the United States is controlled at both the federal and state levels. Federally, fisheries management is ultimately guided by the Magnuson-

Stevens Act (MSA), and therefore Congress (Crosson 2012). The MSA regulates fisheries in federal waters, which range “from three miles offshore . . . out to 200 miles” (Wallace and Fletcher n.d., 17). The Department of Commerce, the National Oceanic and Atmospheric Administration (NOAA), and the National Marine Fisheries Service (NMFS) sub-agency are part of the federal government’s executive branch and are responsible for implementing the MSA (Crosson 2012). Fishery Management Councils, which are not part of the federal government, are also responsible for implementing the MSA (Crosson 2012). Fisheries management is a complicated process involving many different governmental and non-governmental entities. However, not all fisheries in Georgia are federally managed, and are rather controlled at the state and local levels until fishers go out beyond three miles and enter federal waters.

The social sciences have been useful in contributing to the best available science regarding fisheries that fisheries management and policymakers rely on to make responsible and informed policy decisions (American Fisheries Society 2006). While social science data has increasingly become used to inform fisheries managers for quite some time (Clay and Olson 2008), fishers’ voices and “a more holistic approach to fishing communities” (Clay and Olson 2008, 152) are still noticeably lacking from fisheries management (Barclay et al. 2016). Because a large part of fisheries management is managing human behavior in addition to natural resources, fishers’ perspectives could provide policymakers with useful insights (Barclay et al. 2016).

Anthropology is a science that commonly uses a global and holistic perspective (Kottak 2011; Kottak 2012). Therefore, while this literature review will focus mainly on fisheries research in the United States, it is important to incorporate international fisheries

literature when relevant. These international examples contribute to the global, holistic perspective employed in anthropological research, and demonstrate different and successful attempts to give fishers a more active role in fisheries management that prioritizes their input and knowledge.

Problems and Solutions in the Fishing Industry

There are various problems facing fishing industries in the United States. One of the most prominent problems is increasing competition from “imports,” the seafood imported from foreign countries that is often farmed or aquacultured and can be sold in American markets for lower prices than American, wild-caught seafood (Blount and Kitner 2007). While imports are not always inexpensive and of inferior quality, they can decrease fish prices in the United States, making it difficult for American fishers to compete and make a living (Blount and Kitner 2007). This problem is compounded by the increasing operation costs (i.e. fuel, ice, gear, groceries) and equipment maintenance, such as nets or traps depending on the fishery (Clay and Olson 2007; Tookes, Barlett, and Yandle 2018; Pitchon 2011; Colburn, Abbott-Jamieson, and Clay 2006; Blount 2007; Blount and Kitner 2007; Bestor 2001; Greenberg 2014). A shrinking labor force, lack of communication and understanding between fishers and those regulating them, and negative public perceptions of fishers and the fishing industry are other obstacles fishing industries contend with (Abbott-Jamieson 2007; Smith and Clay 2010; Blount 2007; Maiolo 2004).

However, various solutions have been implemented in response to these problems. The creation and implementation of turtle excluder devices (TEDs) and bycatch reduction devices (BRDs) is an example that illustrates the fishers' ability to

respond and react to a problem, in this case levels of undesirable bycatch and negative public perceptions (Blount 2007, 14; Greenberg 2014, 111). After learning about the impending mandates of these TEDs and BRDs, fishers helped test and contribute to their designs (Mitchell et al. 1995). Other solutions discussed in the literature include outreach and education, documenting, preserving, and publicizing local knowledge, utilizing local food movements to generate support for fishing communities, and hiring cultural brokers (Abbott-Jamieson 2007; Tookes, Barlett, and Yandle 2018, 8; Blount 2007, 19; Maurstad 2002). For example, in Ancud, Chile, local fishers worked with policymakers to redesign harvest areas so that there was “a more equitable distribution of space between them and the industrial fleet” (Pitchon 2011, 201). Despite the difficulties of dealing with problems such as these, the solutions described here illustrate that the fishing industry can evolve and survive by addressing the various problems with thoughtful and innovative solutions.

Fishing Communities and Culture

Not only is a strong sense of community characteristic of the fishing industry, but these communities constitute distinct cultural groups that share some commonalities, one of which Clay and Olson describe as being “strong cultural beliefs about the importance of fishing to the community” (2007, 29). Clay and Olson’s emphasis on culture aligns with Pollnac and Poggie’s assertion that fishing communities use ritual practices to protect themselves from the risks and stress associated with fishing (2008, 195). Pollnac and Poggie argue that perceptions of fishing and its subsequent dangers differ cross-culturally, which leads to variations in the prevalence of rituals and taboos surrounding fishing (2008, 195). The cultural significance of fishing varies for different communities, and therefore needs to be evaluated within the particular cultural context of a community.

The shrimping industry in North Carolina is culturally significant to the people there and in the early 1900s shrimping developed to be “embedded in the cultural patterns of the region” (Maiolo 2004, 14). Shrimping in North Carolina was such a strong part of the cultural identities of people in the community that it even influenced other activities like “vacation time, sick leave, and personal-leave days” (Maiolo 2004, 28) so that they were scheduled around the shrimping season. Family involvement in the shrimping communities in North Carolina grew as wives and children worked to head shrimp and wives helped their fisher husbands with tasks like bookkeeping (Maiolo 2004, 28). Additionally, many fishers and dealers in North Carolina entered the industry because of family connections (Maiolo, 2004, 121).

Family involvement in fishing is also evidenced in many Puerto Rican fishing communities. In Puerto Rico, as is common among the Caribbean and elsewhere, families rarely rely on a single source of income; jobs in the fishing industry are therefore useful in supplementing their income (Griffith and Pizzini 2002). Like North Carolina fishing culture, women in Puerto Rico “traditionally controlled fishers’ finances as well as the processing, preparation, and sale of the fish” (Griffith and Pizzini 2002, 31) for the male fishers in their families. In both places, families rely on fishing and the fishing industry relies on families to pass on the fishing tradition in return. Additionally, Puerto Rican fishing is often characterized by transnationalism and semiproletarianization, “the combination of formal and informal economic activities” (Griffith and Pizzini 2002, 5). While family relationships and involvement are common amongst fishing communities, it is not the only shared aspect of fishing culture.

Shared knowledge within a fishing community contributes to the culture of fishing, as that knowledge is typically passed down within a particular community and is dependent on the historical, ecological, and cultural contexts of that community. Shrimping communities in Georgia “constitute a cultural group through common experience and shared knowledge” (Blount 2008, 9), which spans many fisheries-related topics and is usually confined to a community. Fishers in North Carolina also exhibit shared cultural knowledge. Although it makes up just a small part of North Carolina’s harvests, channel-netting (a method of fishing in which a stationary net relies on tidal currents to catch the fish) is distinct in that its invention and use is solely found in North Carolina, particularly in Carteret County (Maiolo 2004, 34). As these authors indicate, fishing communities constitute cultural groups and as such they have developed unique and valuable insights to offer regarding solving problems in the fishing industry.

Resilience in Fishing Communities

Resilience is well-documented within the fishing industry (Pitchon 2011; Blount 2007; Blythe 2015; Adger 2005; McConney, Cox, and Parsram 2015). While there are slight variations in definitions of resilience, Johnson, Henry, and Thompson define resilience as fishers’ ability to endure and adapt to changes in several ways: survival, diversification, getting by, incorporating fishing as a part of their identity, and remaining optimistic (2014). Their definition will be used primarily throughout this paper.

While many fisheries exhibit characteristics of resilience, maintaining resilience is not always easy. Management, environmental issues, and development can inhibit resilience in the fishing industry (Worm et al. 2009; Greenberg 2014). These challenges make it imperative for fishers’ unique perspectives to be utilized by fisheries managers

and policymakers so that fishing communities can continue to be resilient and effectively handle ongoing and future problems.

Scholars describe instances of resilience within the fishing industry. Johnson, Henry, and Thompson studied fishers' perceptions of resilience among fishery-dependent communities in Maine. They found that resilience ranged from survival to optimism (Johnson, Henry, and Thompson 2014). For example, some fishers have dealt with problems like increasing fuel prices, yet have survived and still remain a part of the fishing industry in their community (Johnson, Henry, and Thompson 2014, 103). Fishers demonstrate diversification when they take on additional fisheries-related jobs or work in multiple fisheries (Acheson 1981; Johnson, Henry, and Thompson 2014). Puerto Rican fishers display resilience as they diversify by taking on multiple or additional jobs to supplement their incomes and identify much more strongly with fishing than with any other jobs they may take on as part of their diversification (Griffith and Pizzini 2002, 97). Additionally, McConney, Cox, and Parsram found that there are various factors that contribute to resilience in fishing communities, such as social networks based around friends and family helping communities to be resilient and maintain food security (2015, 1360).

Likewise, fishers in Georgia have displayed the capacity for resilience on multiple occasions. In response to increasing demands for shrimp in the early 1900s, a Savannah-based fresh fish business, L.P. Maggioni and Company, began canning seafood (Wheeler 1997, 486-7). Additionally, shrimpers in Georgia have “exhibited resilience by . . . dropping exorbitantly costly insurance on their boats, and remaining on the water for longer periods of time to catch more shrimp” (Blount 2007, 18). Fishers have protested

regulations that simultaneously decreased quotas and increased operating costs, despite these protests being misconstrued by fishery managers as opposition to management and change (Blount 2007, 18). These examples illustrate resilience in that fishing communities experienced a shock or stress, but were able to respond to it without changing the foundation of their community and industry.

While these studies show how resilience in the fishing industry can be successful, there are often conflicting interests that make it difficult for fishing communities. For instance, resiliency can be challenging due to environmental conservation efforts. In the case of rebuilding fish stocks in the United States, helping stocks meet a more sustainable level can require short-term negative consequences for fishers, such as decreased quotas, that many do not want enforced (Worm et al. 2009). Development can also make resiliency difficult, such as in the case of Bristol Bay, Alaska, home of “the biggest sockeye salmon run left in the world” (Greenberg 2014, 166), which is currently at risk due to development plans for Pebble Mine because of the deposits of copper, gold, and molybdenum that are found there. According to Greenberg, “the mine is valued at potentially \$500 *billion*” (2014, 182), meaning if the plans were to be successful that the mine would make more money than the Alaskan salmon fisheries, giving those interested in the mine ample reason to fight for its existence. The mining corporations and investors have more concentrated wealth than Alaskan salmon fishers do, meaning they can wait and pursue the development of Pebble Mine for an extended time period (Greenberg 2014, 182-84). The longevity of this issue makes resiliency to the threat of the Pebble Mine that much more difficult.

These examples emphasize that while there have been many successful instances of resiliency among fishing communities, there are still various obstacles to resiliency that some fishers, communities, and industries must overcome. While the fishing industry may have been relatively resilient against economic stress, prices for shrimp have yet to increase to meet all of the other rising costs fishers must pay, and the number of licensed shrimpers and active shrimp boats continues to decline (Blount 2007, 5). Fisheries management does allow for input from fishers, and while it is impossible to equally meet the needs of all fishers, there is always the opportunity to improve. If management continues to consider fishers' perspectives and ideas about how to address the problems they are currently facing, the regulations implemented to help solve them may achieve a better balance between the fishers' human needs and the socio-economic and ecological needs of a fishery.

Job Satisfaction and Job Attachment

Fishers tend to feel unusually high levels of job satisfaction and job attachment, "despite the risks and uncertainty associated with fishing," (Acheson 1981, 295) which is especially important for their well-being (Seara et al. 2017, 1; Pollnac et al. 2006, 5). As such, fishers are more apt to return to fishing from time off or time spent at other jobs, as is the case in Puerto Rico where fishers tend to be much more attached to fishing than any other jobs they take on, often returning to fishing after traveling to the United States for wage work (Griffith and Pizzini 2002). Additionally, Smith and Clay found that fishers have high levels of job attachment, job satisfaction, perceived well-being, and self-actualization (2010). Not only does job satisfaction contribute to well-being, but

fishing itself improves fishers' psychological well-being, as shown in Puerto Rico where many fishers characterized it as being therapeutic (Griffith and Pizzini 2002).

However, levels of job satisfaction vary based on the fishery and one's status within it (Gatewood and McCay 1990). While fishers enjoy their jobs, they do not typically want to get overly involved in policymaking. If policymakers and fisheries management were able to preserve what fishers enjoy most about their jobs when implementing policy, fishers may be more inclined to comply to regulations (Gatewood and McCay 1990). Gatewood and McCay state that because job satisfaction varies from one fishery to another, policy needs to take the various needs of different fisheries into account to create better, more effective policy (1990). While increasing fisher involvement in the regulatory process will undoubtedly be difficult, if achieved successfully, there is evidence that fishers possess extensive knowledge that could help create policies and regulations that better serve all parties involved.

Fishers' Local Ecological Knowledge

Scholars comment on the vast local ecological knowledge (LEK) that many fishers possess about the local marine life, how LEK can be useful in better understanding the environment, and how it could help to shape good management practices (Maurstad 2002; Berkes and Seixas 2005; Griffith and Pizzini 2002). It is important to note that the difference between LEK and scientific knowledge of a fishery is not insignificant or due to ignorance or lack of understanding on the part of the fishers, but simply different understandings and explanations of fish behavior, fisheries, and the environment (St. Martin 2001; Maiolo 2004). Fishers' knowledge and perspectives differ

from biologists and policymakers: however, fishers' importance should not be underestimated, as they can help create effective changes in the industry.

There are several examples of the extent and importance of fishers' LEK within fishing communities. Fishers in the North Carolina shrimp fishery not only have an extensive understanding of the environment in which they work, but they have constructed a set of rules/customs based on knowledge that "everyone in the industry seems to understand" (Maiolo 2004, 39) and abide by. One such well known rule regarding channel-netting in locations that are known to be more productive requires that fishers meet a list of qualifications if they want to "lay on a set," or reserve that spot for themselves: "the fisherman must have a skiff, with his channel net gear on board, at the location . . . [and] traditionally someone has to occupy the boat" (Maiolo 2004, 39). Other local rules/customs dictate how outsiders should shrimp in the area, how to effectively reserve a location to channel net in when someone else is already there, and how to interact with other fishers, such as maintaining an appropriate distance between fishers (Maiolo 2004, 38-41). In Puerto Rico, fishers demonstrate a strong understanding of special skills and knowledge, such as operating and maintaining their boats, nets, traps, and equipment, that most other residents do not have and that they are admired for (Griffith and Pizzini 2002, 46). Puerto Rican fishers display LEK regarding the Caribbean Sea ecosystem, including "the characteristics of the various bottom structures of the Caribbean sea, currents, seasonal and regional variations, markets, and the region's wide variety of species of fish" (Griffith and Pizzini 2002, 73-4) that helps them navigate the Puerto Rican fishing industry.

Fishers' knowledge proves useful for creating and implementing good management and policy. Maurstad argues, "fishers have a substantial body of knowledge . . . crucial for successful management regimes" (2002, 161). The Newfoundland cod stock collapse demonstrates the importance of local fisher knowledge and management. In the years preceding the collapse, local fishers "were crying out about their diminishing takes, and pointing to the great loads being hauled in by the offshore trawlers and draggers," and even went so far as to "commission their own study on the cod stocks, the Alverson Commission" (Mason 2002, 7-8), but were largely ignored despite their efforts. Had fisheries management placed greater value in the knowledge possessed by the local fishers and considered their knowledge when implementing policy, the cod stock collapse could have been less severe or even avoided. This example demonstrates the importance of fishers' LEK and the benefits it can provide when implementing policy.

Brazil's Ibiraquera Lagoon fishery provides further insight into the importance and usefulness of LEK. In southern Brazil, fisheries management practices were "based on local ecological knowledge and enforced by social rules" until the 1970s when the lagoon fishery became open-access as the result of socioeconomic changes, such as "the development of external markets for shrimp and technological innovations in fishing gears" (Berkes and Seixas 2005, 968). In the following years, the fishers' knowledge was used to create new regulations that banned all nets except for cast nets, banned the use of bright lights while fishing, and increased the cast-net mesh size for shrimp that successfully resulted in a "more equitable allocation of resources" (Berkes and Seixas 2005, 970).

Because “fishers possess a profound understanding of their marine social-ecological systems,” (Blythe 2015, 161) it is not surprising that fisher knowledge is increasingly important for fisheries management (Maurstad 2002). Fishers’ LEK is well-documented in fisheries research and has been shown to be effective in fisheries management (Berkes and Seixas 2005). Fishers’ knowledge of their fishery and the environment in which they work is extensive, and as such it is extremely valuable and useful to incorporate into management to create better policies that not only consider the scientific knowledge of an area or fishery, but the human aspect as well.

Fisheries Management

Fisheries management in the United States is a complex process overseen by many interconnected parties. At the federal level, it is governed by the Magnuson-Stevens Act, which was passed in 1976 (Crosson 2012). Congress’ Department of Commerce oversees the National Oceanic and Atmospheric Association (NOAA) and the National Marine Fisheries Service (NMFS) (Crosson 2012). The NMFS has regional offices that are responsible for developing regulations and management plans and science centers that are responsible for conducting the primary research on which the regulatory process is based (Crosson 2012, 5). Additionally, there are eight fishery councils that function under sub-national governments, mostly those of the state, but also Congress, that work with Scientific and Statistical Committees (SSCs) and NMFS to choose management plans for the fisheries over which they preside (Crosson 2012).

While these different organizations work together and share the many responsibilities of fisheries management and conservation, (Crosson 2012), there is also state-level fisheries management. In Georgia, state waters extend up to three nautical

miles offshore, beyond which is known as the Exclusive Economic Zone (EEZ) which extends to 200 miles offshore and is federally controlled. The Georgia Department of Natural Resources (DNR) is responsible for state-level commercial fisheries management. Depending on if fishers primarily work within state or federal waters may determine which management level is more influential for them. However, some may work in both or with fish species that travel between states (interstate), making the management process for commercial fishers even more complicated. (NOAA n.d.b; Georgia Department of Natural Resources 2018).

The Magnuson-Stevens Act (MSA) originally came about due to concern over the presence of foreign fishing fleets along the coastal United States and established the 200 mile EEZ that became effective in 1983 (Crosson 2012; Greenberg 2014, 108; Maiolo 2004, 1). Recently, however, its focus has shifted to conservation and NOAA monitors over 470 fish stocks or stock complexes (Crosson 2012; NOAA n.d.a; NOAA 2018a). According to NOAA, as of the end of 2017 the number of overfished stocks reached 35, a record low, demonstrating that the shift towards sustainability and conservation following the 1996 Sustainable Fisheries Act (SFA) and the 2006 reauthorization of the MSA (NOAA 2016) has had a positive impact on the populations of fish stocks (2018b). While NOAA and the MSA enforce a standard for fisheries in the United States to abide by, management systems such as this do not exist everywhere (Tookes, Barlett, and Yandle 2018, 4). The laws surrounding fisheries management vary between countries and the United States has “stringent regulation and management strategies that are seen as exemplary among international experts” (Tookes, Barlett, and Yandle 2018, 4). However, this means that fisheries in the United States are more economically vulnerable to

imports, making fisheries management in the United States, and communication with the fishers involved, that much more important (Tookes, Barlett, and Yandle 2018).

While scientific data on fish populations and reproduction are vital, effective policy must consider the fishers it will affect and qualitative social science research can support fisheries management and increase understanding of fisheries. This is important for regulations and management because “managing fisheries resources means managing human behaviour,” (Barclay et al. 2016, 426) and regulations do not affect all fisheries and fishers equally (Ingles and Sepez 2007; Clay and Olson 2008; Gatewood and McCay 1990). Despite the benefits of incorporating social science into fisheries management, there is still a gap between fishers and fisheries management because of previous emphasis on the importance of biology and economics (Acheson 1981, 300). Increasing the understanding between different actors involved in fisheries management and considering the knowledge and perspectives these different groups have may prove to be valuable.

Qualitative social science can link fishers to policymakers for improved management and governance which is important for fisheries because fisher involvement and influence in management is generally minimal (Barclay et al. 2016). For example, In Puerto Rico, a proposed marine sanctuary was not properly or thoroughly explained to the fishers it would impact. Fishers were not given “precise knowledge about what a marine sanctuary entailed,” (Griffith and Pizzini 2002, 212) with just an inadequate Spanish translation provided at a meeting about the sanctuary held entirely in English. This made fishers feel ignorant about the significance of the sanctuary and resentful towards the government for leaving them out, despite fishers being the ones best

equipped “for the development of an effective resource management strategy” (Griffith and Pizzini 2002, 212-13). Without having the proposed projects and regulations properly explained to them in the language they could best understand, Puerto Rican fishers were effectively excluded from the management process and could not have participated to the fullest extent, even if they had wanted or tried to.

Brazil’s Ibiraguera Lagoon fishery exemplifies how incorporating fishers and their knowledge into fisheries management can be successful. The Federal Fishing Agency in the Ibiraguera Lagoon fishery “included local fishers’ input in the formulation of regulations, . . . including a rich set of fishers’ own management measures and fishers’ rules” (2005, 970) that Berkes and Seixas argue created better equal opportunity between fishers and therefore improved management. Considering fishers’ extensive knowledge of their fisheries and the perspectives and insights they can offer, they can be valuable assets to fisheries management. While it may be difficult to increase fisher participation in management and successfully accommodate both the fishers and the fish, their insights and experiences may help shape more effective policies and regulations.

Conclusion

Commercial fishing industries in the United States are currently experiencing a multitude of problems, but fishers’ unique perspectives can be used by fisheries managers and policymakers to help solve these problems. Fishing communities are cultural groups that share cultural norms, some of which are similar across communities while others are developed within the unique context of a particular community. Fishers tend to have above average levels of job satisfaction and attachment, despite the uncertain and dangerous nature of their jobs. Resilience among fishing communities is common and

demonstrates that the fishing industry can recognize an issue and respond to it. Fishers are extremely knowledgeable about their surrounding community and environment, and that knowledge equips fishers with a unique perspective and insight into the fishing industry and the problems it is currently facing. Utilized by fisheries managers and policymakers, fishers' knowledge could prove extremely useful for improving management and regulations to solve various problems. Therefore, listening to fishers' might be useful for policy that, once implemented, affects their families and livelihoods the most.

Methods

In March of 2018, the author was part of a study team that conducted pilot research comprised of 32 oral history interviews with Georgia fishers. These elicited in-depth investigations into fishers' perspectives on the problems and solutions their industry is facing. The author conducted subsequent research that forms the basis of this paper. It involved six semi-structured interviews and 12 card-sorting interviews conducted with members of Georgia's commercial fishing industries in September and October of 2018. While data collection was done with a fellow honors student, all analyses and this thesis are the sole product of the author.

Study Population

The interviews were conducted with members of Georgia's commercial fishing industry who resided in Brunswick and Darien, Georgia. This study population is the same as the pilot research conducted in March 2018 and was chosen because connections to the local communities and fishers were already established. Participants in this

research project included shrimpers (two of whom are also jellyball fishers), a crabber, a fish house manager, and Sea Grant employees. Participants were at least 18 years of age.

Sampling and Recruitment

Interviewees were recruited from the original pilot study population from March of 2018 by contacting the individuals that the researcher had originally interviewed. They were informed about this research opportunity, allowing for the identification of participants with whom the researchers had already established rapport. The research team then engaged in snowball sampling by asking interviewees and key informants to identify others who might be willing to participate in the study (Noy 2008, 330).

Snowball sampling allowed the researchers to gain access to new participants that were not part of the original research project, increasing the scope of responses and information received. Before every interview, the purpose of the study was explained, and informed consent was obtained in the form of verbal assent to maintain confidentiality of the participants (Appendix A). Informants received a printed copy of the informed consent form.

Data Collection

Six preliminary semi-structured interviews focused on the interviewees' experiences, the issues, challenges, and decline they have observed during their time in the fishing industry, and what they think should be done to revitalize the industry. Semi-structured interviews allowed the researchers to follow the interviewees' responses and pursue additional topics, while maintaining control of the interview and being able to redirect them back to the research questions when necessary (Bernard 2002, 212). This interview format allowed us to focus more on the fishers' responses to increase the

“internal validity and contextual understanding” (Maxwell 2005, 88) of the interviews. During these initial interviews, participants were given a freelisting prompt (Dressler et al. 2005). Interviewees were asked to list the problems they think Georgia’s commercial fishing industry is facing, as well as what they believe are the solutions for those problems.

The problems and solutions most frequently mentioned in the six semi-structured interviews were used as the basis of the following 12 card-sorting interviews (Dressler et al. 2005). While there were more than five problems mentioned by the interviewees, the five selected were those that were very clearly mentioned more frequently, as the others not included in the card-sorts were only mentioned by one to two fishers at most. There was less of a clear distinction in how frequently fishers mentioned solutions, hence the selection of eight solutions, rather than five.

During the card sorting interviews we asked interviewees to arrange the problem and solution cards in response to questions such as: “Can you arrange the problems in order from what you consider most to least severe?” and “Can you arrange the solutions in order from what you consider most to least helpful to the industry as a whole?” This card-sort activity allowed us to determine if there was consensus among the participants.

Each interview was recorded on multiple electronic devices. The audio files were then uploaded to a secure Google Drive folder, accessible only by members of the research team.

Data Analysis

To analyze the interview data, the researchers first transcribed the interviews with some transcriptions assisted by the transcription software service, Temi. The completed

transcriptions were coded manually for the problems the fishers identified, the solutions they proposed, and additional overarching themes that emerged that could be used to help explain the current situation of Georgia's commercial fishers.

The data from the card sorting tasks was recorded and entered into an Excel spreadsheet which allowed for both quantitative and qualitative analysis. Numerical values were assigned to the interviewees' rankings for each problem and solution and then averaged to find the mean, revealing what problems and solutions were perceived as the most severe and most helpful overall. The researchers looked for patterns and similarities regarding who ranked certain problems and solutions a certain way.

Finally, after the initial coding and data analysis, the researchers continued to review the data to identify key themes that would ultimately be the basis of the results, which are discussed below.

Results

The results presented below will include the card-sorting responses regarding the problems and solutions, as well as the themes identified throughout both the semi-structured and card-sorting interviews. Direct quotes from the fishers will be used when presenting the results gleaned from the qualitative data analysis so as to support and illustrate the identified themes in the fishers' own words.

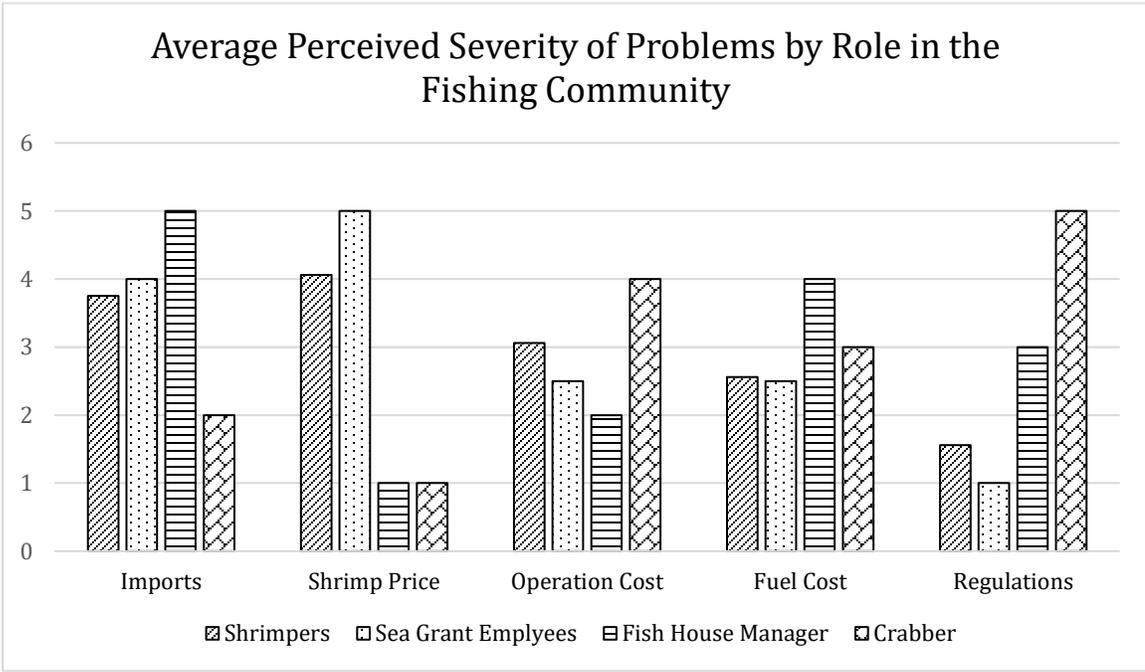
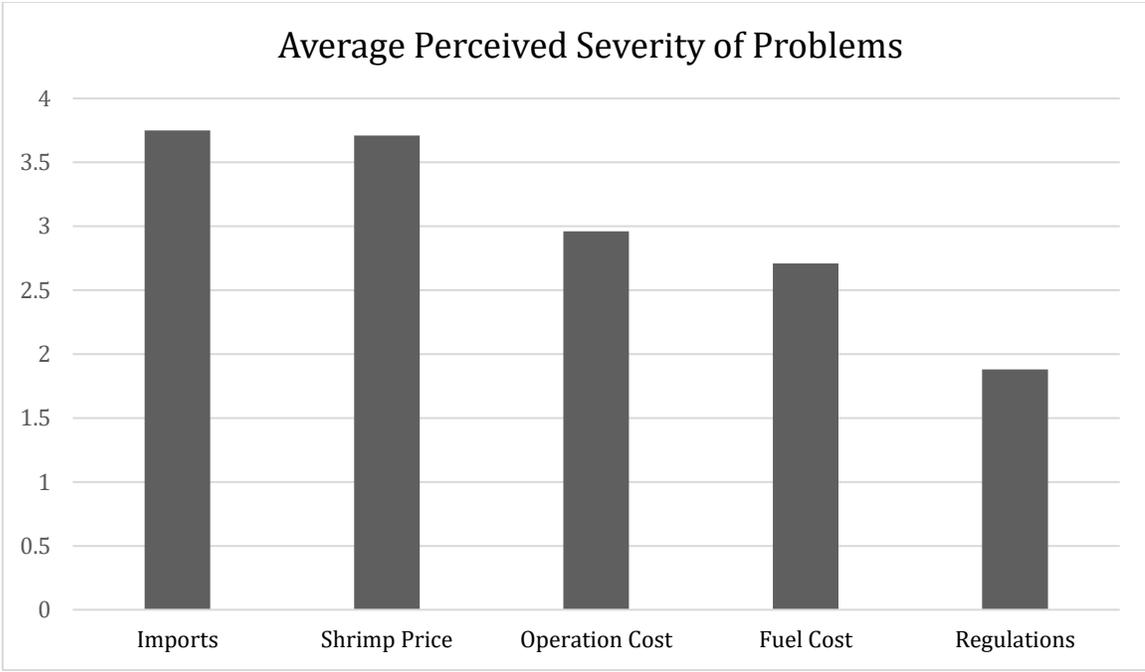
Problems

During the six initial semi-structured interviews, interviewees were asked about their experiences in the commercial fishing industry, the changes they have observed throughout their careers, and given a freelisting prompt at the end of the interview in which they were asked to list the problems that were affecting the industry. Based on

their responses to the interview questions and the freelisting prompt, there were five problems that were frequently and commonly mentioned by the majority of the participants. These problems, imports, shrimp price, fuel cost, operation cost, and regulations, were then used in the card sorting interviews.

During the 12 card sorting interviews, participants were asked to rank the five problems mentioned above from what they perceived to be the most severe problems to the least severe problems currently impacting the fishing industry in coastal Georgia. Interviewees' responses were each assigned numerical values to determine the average ranking of the problems from most to least severe. Responses ranked most severe were scored five (because there were five problems) and so on down to the problem ranked least severe, which was scored one. The scores for each problem, based on where each of the interviewees ranked said problem, were then averaged for a final severity score, out of a possible five points for the most severe problem. The results are as follows from most to least severe: Imports (3.75); Shrimp Price (3.71); Operation Cost (2.96); Fuel Cost (2.71); Regulations (1.88).

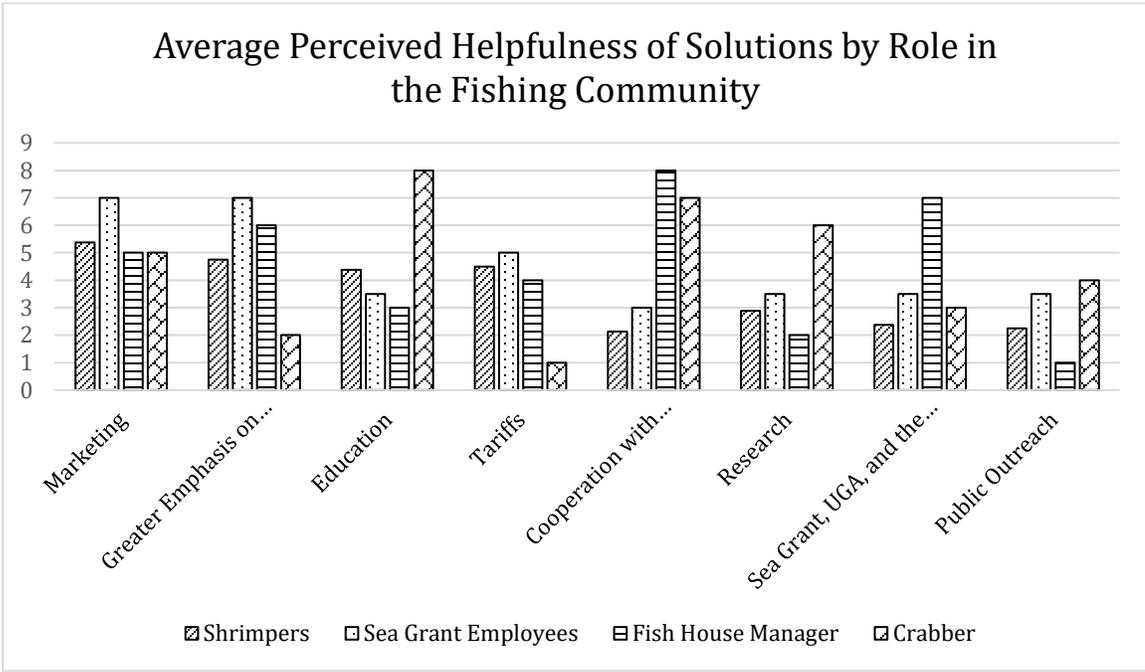
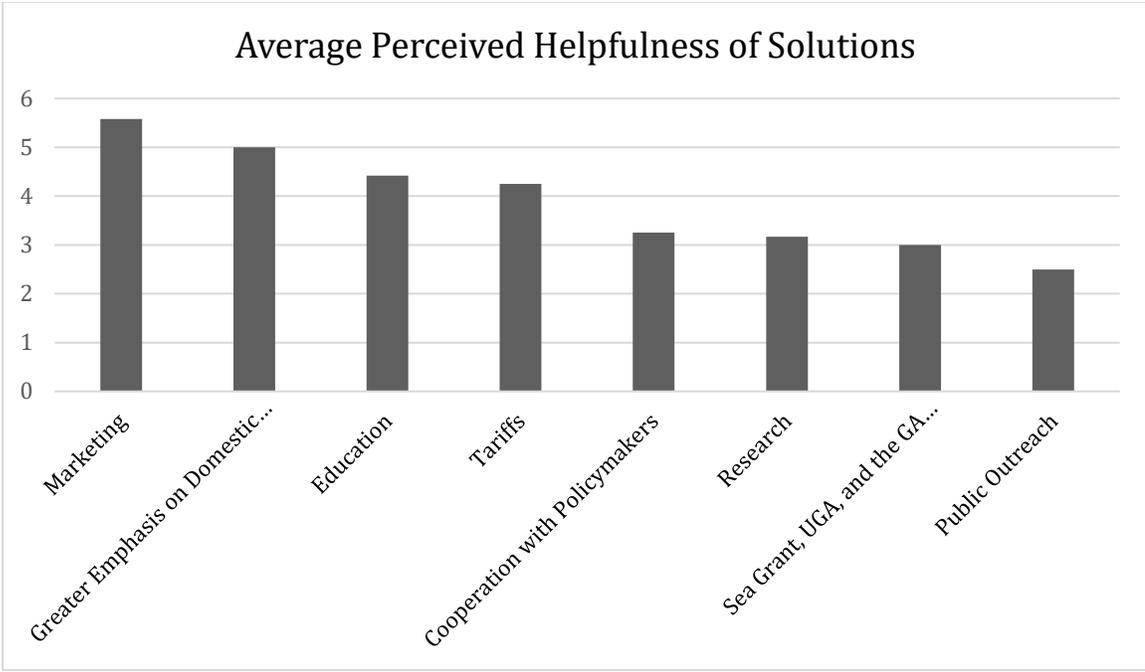
When analyzed in this way, imports had the highest score overall, indicating it is perceived as the most severe problem on average; however, when the rankings were analyzed dependent on the interviewee's role in the industry the results were different. For example, on average shrimpers found imports much more problematic than the crabber. These results are depicted below.



Solutions

In addition to being asked to list the problems affecting the commercial fishing industry, participants were asked to list solutions they think are helping the industry. These could be already implemented solutions they think are helping, or things that they think would be helpful if they were implemented. Based on their responses to the interview questions and to the freelisting prompt, there were eight solutions most frequently mentioned. These solutions, marketing, greater emphasis on domestic shrimp, education, tariffs, cooperation with policymakers, research, Sea Grant, UGA, and the Georgia Bulldog, and public outreach, were then used in the card sorting interviews.

During the 12 card sorting interviews, participants were asked to rank the eight solutions stated previously from what they perceived to be the most helpful solutions to the least helpful solutions. Again, interviewees' responses were each assigned numerical values to determine the mean average ranking of each solution. Responses ranked most helpful were scored eight (because there were eight solutions) and so on down to the solution ranked least helpful, which was scored one. The scores for each solution were then averaged for a final helpfulness score. The results are as follows from most to least helpful: Marketing (5.58); Greater Emphasis on Domestic Shrimp (5); Education (4.42); Tariffs (4.25); Cooperation with Policymakers (3.25); Research (3.17); Sea Grant, UGA, and the Georgia Bulldog (3); Public Outreach (2.5). However, when interviewee's responses were divided again and analyzed according to their role in the fishing industry, the perceived helpfulness of solutions varied. These results are depicted below.



In addition to interviewee's rankings of problems and solutions, the transcripts of both the preliminary and card-sorting interviews revealed several relevant themes: acceptance of conservation, local ecological knowledge, the complexity of implementing solutions, lack of support, and resilience.

Acceptance of Conservation

Fishers have evidently become more willing to accept conservation and conservation-oriented regulations like TEDs and BRDs. Nine out of 15 interviewees (60%) discussed conservation and ways in which the industry has become more prone to conservation efforts. As one shrimper stated, "the fishing industry is a lot more prone to conservation today than it used to be with the implementation of . . . the TEDs and the fisheye BRDs." Because of the more recent emphasis on conservation, it appeared that the industry has become more accepting of regulations put in place to ensure the conservation of various species, namely sea turtles through the implementation of TEDs. Seven of the 15 interviewees (46.67%) discussed how regulations are not as much of a problem when considered against the other problems they face. One shrimper acknowledged that "there's got to be some kind of regulation and policies set in place so that we are protecting [the environment] for the future generations." The fact that regulations were consistently ranked as one of the least severe problems plaguing the fishing industry during the card-sorting interviews reinforces fishers' acceptance for these types of regulations.

Local Ecological Knowledge

In addition to an evolving relationship with the environment, the data also demonstrated that fishers possess extensive local ecological knowledge (LEK) from their

experiences in the industry. Throughout both the preliminary and card-sorting interviews, nine out of 15 interviewees (60%) demonstrated specialized knowledge about their local environment. One example came from a crabber who explained, “At times crabs can be very depth sensitive and you might put a crab trap in three foot of waters certain times a year and you’ll catch two dozen crabs. If you put that trap in four foot a water, you might only catch three crabs.” This crabber possesses LEK about depth sensitivity in crabs and areas that might have more crabs throughout the year that he has learned during his career.

Another example of LEK came from a shrimper commenting on the worsening environmental conditions of a previously popular fishing location who said, “We used to go up there and drag a lot for shrimp, catch a lot a crabs and pretty fish and all. But now, you go up there, very few shrimp. There’s no crabs at all and fish bout non-existent. Something changed that in last 10 years and there’s more new golf courses and I just think they do all these chemicals to keep the turf green and the grass pretty and a lot of that water, when it rains and stuff, will drain into the [river].” While not being able to explain this situation in precise scientific language, this shrimper has made observations and assessments about his local environment. Throughout his career as a shrimper in this area, he has been able to observe the environment regularly for an extended period of time and react to changes in shrimp and fish populations, providing him with this LEK and valuable insights into the changing environment.

The Complexity of Implementing Solutions

Despite the Georgia fishing industry’s changing relationship with the environment, and fishers’ extensive LEK, creating and implementing effective solutions

remains a complicated task. In addition to the existing difficulties with management, government, and policies and regulations, members of the industry are affected by problems differently and will thus need specific solutions. Therefore, it is not surprising that interviewees expressed mixed feeling towards the various solutions that have been implemented and that were presented to them in the card-sorting interviews.

One such example is marketing. While marketing was perceived to be the most helpful solution overall by the shrimpers and Sea Grant employees, it was one of the employees who expressed doubts towards the effectiveness of marketing. According to him, “marketing is double-edged sword . . . you’re marketing for shrimp and if somebody misses the domestic part of shrimp or doesn’t know what domestic or imported means, they just think it’s shrimp . . . [so] you’re promoting your enemy too . . . Marketing is part of what brought imports in so heavy, almost like it’s a part of the beginning of the problem.” However, his qualms about marketing were not shared by all, as others praised marketing and felt the industry would benefit from more of it.

Yet another contested solution was tariffs, as some praised tariffs for helping shrimp prices, while others felt that the distribution of the tariff money as compensation for fishers being negatively affected by imports was inadequate. Positive reactions to tariffs included a shrimper who stated, “I think tariffs certainly help,” and a fish house manager who said, “Tariffs are to help combat some of the low prices, which keeps our prices up.” While these two interviewees were not the only ones who shared this positive view of tariffs, there were negative views about tariffs expressed during the interviews as well. As one shrimper ranked tariffs as the least helpful solution, he explained his decision: “We don’t get no tariff money.” Other shrimpers expressed their dissatisfaction

with the redistribution of the tariff money as the amounts they received decreased every year (and as fish houses began to submit their “qualifying expenditures,” meaning they could receive a percentage of the tariff money intended to compensate the industry for the impact of imports on product prices, which many shrimpers considered unfair).

Lastly, several shrimpers and Sea Grant employees noted both the benefits and unintended consequences that developed after the mandatory implementation of TEDs. As shrimpers have had time to adapt to regulations like TEDs and become more accepting of conservation, the TEDs have become less severe of a problem as they once were. However, as one Sea Grant employee explained, “before we had turtle shooters a lot of sharks would die . . . but now they just go right out. The fellas have fished a day or two then they’ll sit at the docks . . . [to] sew up the shark holes from the two days before . . . it’s a big problem now, the sharks.” A shrimper also made the connection between the implementation of the TEDs and increasing shark populations that now cause frequent damage to nets and other gear. He stated, “I think the large shark numbers are increasing because . . . the TEDs are working very efficiently,” and that the damage from these sharks “cost[s] a lot of time, labor, and production . . . and it’s [an] everyday thing.” As indicated by these interviews, shrimpers have been able to adapt to TEDs and appreciate the environmental benefits of them, but they believe their effectiveness in reducing bycatch has unexpectedly resulted in a rise in the number of sharks they encounter. Shrimpers therefore must spend more time and money repairing the damage that sharks inflict on their nets and gear. These factors and conflicting sentiments regarding marketing, tariffs, and TEDs illustrate the difficulty and complexity the fishing industry faces in implementing effective solutions.

Lack of Support

Lack of support is another common theme that emerged from the interviews. Interviewees expressed feeling a lack of support from within the industry, from the public, from the restaurant industry, and from the government. According to 20% of interviewees, the fishing industry itself could be more supportive of its members and their ability to organize themselves to achieve a common goal; as stated by one shrimper, “they should be sticking together” because “that would get something going.” Furthermore, almost half of the interviewees expressed conflicting feelings towards fish houses. While some indicated that they would like to see more fish houses in the future of the industry, others perceived their relationship with the fish houses as more of an obligation because of the necessary resources the fish house provides shrimpers, such as ice and fuel.

Additionally, 60% of interviewees perceived lack of support from the public. Some commented on the need for “better reputations for fishermen,” while one shrimper commented on the bad publicity the industry received, stating, “For a long time the industry got nothing but bad publicity . . . In the eighties . . . when the big fight over the TEDs was going on and Teenage Mutant Ninja Turtles, baby turtles killed by evil shrimp trawler or fishing trawlers . . . that's the type of publicity that we were getting. There was nothing good. Shrimpers blockading bridges refused to do this, refused to do that. Go on strike. But nobody ever got down to ask him why. Nobody ever asked our side of it.”

Lack of support from restaurants was discussed by 40% of interviewees. In the United States, the majority of seafood is consumed in restaurants (Jahns et al. 2014), making the accuracy of information that restaurants provide consumers with about their

seafood important. As stated by one Sea Grant employee, “The restaurants . . . tell us it’s local, and you go out by the dumpster and you got the imported products from Taiwan boxes in the dumpster, but they seem to tell the waitstaff to tell everybody it’s local and it’s deception.” Other shrimpers complained about the deception restaurants engage in, as well as when restaurants market and sell domestic, wild-caught, local seafood and imported seafood as products of equal quality.

Lastly, 86.67% of interviewees discussed lack of support from the government in their interviews. The context and extent of the lack of support varied, ranging from stories about government employees such as DNR directors making negative comments about the fishing industry, to dissatisfaction with government regulations that “slow our production down,” to perceived disregard and disrespect for fishers’ LEK, and insight into their industry. For instance, a crabber recounted a negative experience he had with regulated weak links: “I said, ‘Well what good [is] your weak link? My buoy is the weakest part of the whole thing.’ He said, ‘Well can I take that back and show [the] data?’ ‘Go ahead.’ [I] never heard nothing out of it. I mean I showed you that your stuff isn’t gonna work, but I’m just a dumb crabber.” Weak links are mandated to avoid right whale entanglement, and this crabber’s experience using them indicates that they may not be sufficient in practice. Despite this interviewee’s knowledge and experience actually using the weak link, he felt his critiques on the gear’s effectiveness were disregarded because of his position as a “dumb crabber,” rather than taken seriously and used to improve the gear.

Resilience

Despite the problems the industry is facing and the lack of support they feel not

only within their industry, but from the public and government as well, the commercial fishing industry of coastal Georgia has been resilient. As defined by Johnson, Henry, and Thompson (2014), resilience can manifest in five different ways: (1) survival; (2) diversification; (3) getting by; (4) social identity; (5) optimism. By this definition, there was evidence of resilience among 80% of interviewees. An example of optimism as resilience comes from one shrimper who said, “They’ll always be a domestic shrimping fleet I believe. I think they’ll always maintain . . . Hope so.” Other instances of resilience include participation in multiple fisheries (i.e. shrimpers who also jellyball) or fisheries-related jobs (diversification), an upcoming school program designed to encourage students to enter the fisheries (social identity) and adapting to and overcoming challenges during difficult times (survival and getting by). Such strong evidence of resilience among these interviewees is indicative of a hopeful future for coastal Georgia’s commercial fishing industry.

Discussion

Both the semi-structured and card-sorting interviews revealed interesting insights into the struggles felt by various groups in coastal Georgia’s commercial fishing industry. For clarity’s sake, some problems and solutions will be discussed together, particularly those that are more closely related and were connected by some of the interviewees. The common themes identified by the qualitative data analysis will also be discussed.

Imported Seafood

While competition from imported seafood was perceived to be the most severe problem overall, it was only perceived as the most severe problem by the fish house manager when analyzed by role in the fishing industry. Imports were the second most

severe problem according to both shrimpers and the Sea Grant employees. Many view “pond-raised” or aquacultured shrimp as being responsible for drastically lowering the price they could get for their wild-caught domestic product (also seen in Blount and Kitner 2007). The crabber considered imports the second least severe problem; because he grades and sells his own crabs to a reliable outlet in the Northeastern United States, he gets a better price for his product and is less susceptible to imported competition.

Most interviewees noted the necessity of imports to support and sustain American seafood consumption, and acknowledged that the domestic industry is not able to meet demand on their own. Some even recognized that there are some very high quality imports on the market that are comparable to their domestic products. It seems then that the main issue most interviewees had with imports, was not as much their existence on the market, but their domestic, wild-caught product being marketed and sold as the same quality product as imports, as well as consumers’ lack of knowledge regarding the differences between them. If more consumers knew where their seafood came from and how it was harvested, it would enable consumers to make more informed purchasing decisions. While this may or may not lead to greater consumption of domestic seafood, it would provide consumers more opportunity to do so.

Shrimp (Product) Price

Shrimp price was the second most severe problem overall and considered the most severe amongst shrimpers and Sea Grant employees. Two of the three shrimpers who did not consider shrimp prices to be the most severe problem are individuals who do not rely as heavily on the traditional market: one has a non-fisheries related job and therefore does not rely on shrimping as his only source of income, and the other operates

outside conventional market methods by marketing and selling his own shrimp, rather than to a fish house.

The shrimper who has a second, non-fisheries related job (an example of occupational multiplicity) likely has more freedom in his business, as he does not rely solely on shrimping. When prices are low or the waters are closed, he still maintains a stream of income, and can afford to shrimp less often or when it is more lucrative. The shrimper who circumvents the traditional method of selling his shrimp to a fish house is not impacted (at least as heavily) by sudden changes in shrimp prices, as he sells directly to consumers.

On the contrary, both the crabber and fish house manager considered shrimp price to be the least severe problem. The preliminary interviews had only been conducted with shrimpers and Sea Grant employees, which influenced the phrasing of “shrimp price” rather than a more ambiguous “product price.” To rectify that during the card-sorting interview with the crabber, the researchers explained that the card could be interpreted as crab or product price instead. This did not change the outcome of the crabbers’ ranking of this card, as he gets a good price for his product because he grades and sells his crabs to the Northeastern United States. However, because not all crabbers grade their own crabs or have buyers in the Northeast, how accurately this particular crabber’s opinions reflect those of other crabbers is unclear.

Shrimp price (or product price) is an example of how some fisheries may be differentially affected by certain problems, and how even in the same fishery there is individual variation. For those in fisheries like shrimping that seem to be more negatively impacted by low prices and imports, being able to continue in the fishery may require less

reliance on traditional market methods in the future. Product price can be more problematic when operation costs are higher, as the more expensive it is for a fisher to run his business and catch his product, the more difficult it is to make a profit.

If shrimp price continues to be very problematic for shrimpers (or product price for other fisheries), it will be imperative for one's success in the industry to be able to find ways to adapt and survive when prices are low. Whether it is by supplementing their income by engaging in occupational multiplicity, selling and marketing their own product, or finding other ways to balance their costs with the price they receive so they can stay in business, fishers may need to shift strategies if prices do not improve.

Fuel Cost and Operation Cost

During the semi-structured interviews, there seemed to be a distinction between "fuel cost" and "operation cost," as they were typically both mentioned separately. In the card-sorting interviews, however, these two cards were sometimes ranked as equally problematic, and almost always ranked one after the other. For these reasons and because fuel cost is ultimately part of operation cost, they will be discussed together.

Overall, operation cost was perceived as the third most severe problem, with fuel cost as the fourth most severe. Of all the interviewees, the crabber considered operation and fuel cost the most severe, with operation cost as the second most severe problem, followed directly by fuel cost. Operation costs will vary by fishery, based on what equipment is needed (i.e. crab traps or shrimp nets). They will also vary individually within a fishery, based on an individual's role (i.e. captain or crew), the type and size of boat used (i.e. wood or fiberglass), and many other factors. Operation and fuel costs are unavoidable expenses fishers must pay, which might help explain why they were

perceived as less severe than other problems. If imports did not contribute to lower prices, operation costs would be more manageable. These costs are likely to increase over time, unless technological advancements and increased fuel efficiency help ameliorate some of the burden these costs have on fishers.

Regulations

Overall, regulations were perceived to be the least severe problem. Shrimpers and the Sea Grant employees also ranked regulations as the least severe problem, but the crabber ranked regulations as the most severe problem and was the only interviewee to do so. In his interview he discussed several instances of regulations changing and interfering with his ability to catch crabs. He explained how regulations regarding catching sponge crabs changed unexpectedly and without warning. At first the restrictions on catching sponge crabs were implemented as a temporary response to declining crab numbers after a drought, but were then made permanent unbeknownst to the crabbers. He also discussed an encounter with a government agent in which he demonstrated that the weak links mandated to avoid right whale entanglement were not very effective in practice, but felt he was disregarded.

Most interviewees recognized the need for regulations. They seemed to accept that regulations are put in place for a reason and have had some positive impacts, such as TEDs and BRDs eliminating bycatch and thus making their catches cleaner and their shrimp more marketable, as well as preserving the environment for the future. While fishers may not all agree with or like every regulation, most interviewees acknowledged the need for them and knew that they were something they had to deal with as part of their jobs. This reason, as well as having had time to adjust to some regulations over time

(i.e. TEDs and BRDs have been in place for decades), could account for regulations being ranked as the least severe problem on average.

However, many interviewees seemed to express more of an issue with the effectiveness (or perceived lack thereof) of regulations, rather than solely their existence. Interviewees felt regulations hurt their business and did not always serve their intended purpose effectively. The crabber did not have an issue with having to use weak links to help avoid right whale entanglement; rather, he felt that in practice the weak links were ineffective, and when he brought this to the attention of a NOAA employee, the problem remained unaddressed. Because it is impossible to create and implement regulations that benefit all fishers equally and because many fishers are not overly involved in the policymaking process (and many do not necessarily want to be), implementing more effective regulations remains a difficult endeavor.

Marketing and Greater Emphasis on Domestic Shrimp

Fishers seemed to differentiate between marketing and greater emphasis on domestic shrimp in the semi-structured interviews, when in fact they are arguably very similar. Marketing can emphasize domestic product in contrast to imported seafood, such as shrimp. For this reason and because they were perceived as the two most helpful solutions on average, they will be discussed simultaneously.

Marketing and greater emphasis on domestic shrimp were the two most helpful solutions overall (according to shrimpers and Sea Grant employees) and in the top four most helpful solutions (according to the fish house manager). Shrimpers might benefit from marketing and greater emphasis on domestic shrimp to promote their product in attempts to reduce the competition and negative impact of imports.

However, marketing can potentially promote imports by raising awareness for shrimp in general. While not all imports are bad and seafood in general is healthy, if marketing inadvertently promotes imports, it is not benefitting domestic fishers. This potential risk seems to be worth taking, however, as indicated by the results of the card-sorts. Because imports are necessary to meet the demand for seafood in the United States and because domestic seafood is more easily accessible in coastal areas, marketing campaigns aimed at promoting domestic seafood products (i.e. shrimp) over their imported counterparts may be most beneficial to domestic commercial fishers if concentrated in areas where purchasing domestic seafood is more accessible.

Tariffs

Tariffs are taxes placed on imported or exported goods. In the United States, “declining incomes for shrimp fishermen . . . led [them] to press for anti-dumping tariffs against a number of major shrimp farming countries” (Goldburg and Naylor 2005, 23) to help reduce competition from imported seafood and the negative impacts imports can have on their product prices. Under the Byrd Amendment (passed in 2003) the money collected from tariffs on imported shrimp “was distributed among hundreds of domestic shrimpers” (Dunaeva and Mathews 2007) who had signed an anti-dumping petition. However, interviewees noted that the compensation they received decreased every year until the Byrd Amendment was repealed in 2007, effectively ending the tariff distribution process.

Despite feeling that the way the money from the tariff distribution process was distributed was unfair, tariffs were perceived to be the fourth most helpful solution on average because of the positive impacts tariffs on imported seafood have on domestic

fishers' shrimp prices. However, this does not completely negate shrimpers' experiences with the tariff distribution process. What once was a way for shrimpers to make back some of the money they spent on their business became a point of bitterness and even resentment. As one shrimper stated, "most of the money went to the bigger businesses like the seafood dealers, the fish house . . . [the] boat itself didn't qualify or get much of that money." Fish houses and seafood processors are undoubtedly important parts of the seafood industry, yet shrimpers seemed to feel they needed the money more than others in the industry. Regardless of the accuracy of this assessment, it is important to note how the tariff distribution process made the shrimpers feel; this negative experience with the government has followed many shrimpers and seems to still affect their perceptions of and feelings towards the government.

Cooperation with Policymakers

Cooperation with policymakers was perceived to be the fifth most helpful solution overall, but it was perceived to be the least helpful by the shrimpers and Sea Grant employees. The data indicates that fishers experience overwhelming feelings of lack of support from the government, which could contribute to the shrimpers' perceptions about helpfulness (or lack thereof) of cooperating with policymakers. On the contrary, the crabber considered cooperation with policymakers to be the second most helpful solution. This is interesting in that while the shrimpers and crabbers have had seemingly similar experiences with the government and share feelings of lack of support, one group perceives policymakers as much less helpful than the other.

While the shrimpers perceived cooperation with policymakers to be the least helpful solution, they also regarded regulations as the least severe problem, whereas the

crabber perceived regulations to be the most severe problem. This could have impacted their differing perceptions about this solution despite both feeling governmental lack of support. However, it was the crabber, who viewed cooperation as more helpful than the shrimpers, who stated, “you gotta have your policymakers, they gotta get their paycheck, so they gotta try to come up with something to do.” The contrast between perceiving cooperation as helpful while simultaneously suggesting that some regulations are unnecessary and simply implemented to keep policymakers busy indicates fishers’ relationships with policymakers and regulations is complex. Fishers’ relationships with policymakers could seemingly be improved if the government were to listen to and support them more than fishers feel they currently do. While not easy, it could lead to better relations and perhaps even higher engagement and participation if their cooperation is perceived as beneficial.

Sea Grant and the Georgia Bulldog: Research, Education, and Public Outreach

The last four solutions, Sea Grant, UGA, and the Georgia Bulldog, research, education, and public outreach will be discussed together. The latter three solutions encompass a lot of what Sea Grant does. Sea Grant, the University of Georgia’s (UGA) Marine Extension Center in Brunswick, Georgia, operates the Georgia Bulldog, a research vessel. According to Sea Grant, their mission is “to support research, education and training, and outreach activities that promote the environmental and economic health in coastal Georgia by helping improve public resource policy, encouraging far-sighted economic and fisheries decisions, anticipating vulnerabilities to change and preparing citizens to be wise stewards of the coastal environment” (Marine Extension and Georgia Sea Grant n.d.). The Sea Grant employees ranked all four of these solutions equally.

Interestingly, the fish house manager perceived Sea Grant, UGA, and the Georgia Bulldog as a more helpful solution than any other group, including the Sea Grant employees. However, the other three solutions were the three he ranked as least helpful.

Based on interviewees' responses, there seems to be mixed ideas as to how helpful Sea Grant is and in which ways they help the industry. While Sea Grant's mission research, education, and outreach that promote health of Georgia's coast, fishers seemingly have unrealistic expectations of Sea Grant. One shrimper expressed his dissatisfaction with Sea Grant's contributions to shrimpers stating, "Why isn't the Georgia Bulldog in Jacksonville this weekend? There ain't no telling how many a camera from one of those helicopters going to come on show the Georgia Bulldog research boat sitting at the dock . . . that's the kind of advertising you can't buy . . . I think they can do better, I sure do." The disconnect between what Sea Grant's mission allows and what shrimpers expect Sea Grant to do is problematic in that if it continues it may cause tension or inhibit a more fruitful working relationship.

Acceptance of Conservation

Many of the participants accepted conservation efforts and recognized the need to preserve the environment for the future, but they felt that this was not always acknowledged by the public and government. Several shrimpers noted that the public still seems to think that they want to destroy the marine ecosystems in which they work. This is counterintuitive because if they were to engage in purposefully destructive behaviors (i.e. overfishing, dragging over coral reefs, etc) it would ultimately be harmful to them and their business. This shift is promising for the industry's future because as more fishers express a desire to protect the environment, both the industry and environment

may last longer, and the longstanding tensions between fishers and environmentalists may develop into a more productive relationship with conservation as a common goal.

Despite fishers' changing attitudes towards conservation and the environment, if the public and policymakers fail to recognize this, there could be potentially damaging consequences. Regarding policymakers, it could result in policy that does not fully account for this changing mindset amongst fishers. In the case of the public, if this negative and false view persists, consumers may react negatively or change their consumption patterns in ways that could hurt the fishing industry. Whether or not fishers' greater acceptance of conservation and regulations (or at least increased tolerance) is recognized by those outside the industry, a shift in coastal Georgia fishers' mindsets towards greater conservation efforts is evident, at least among these particular interviewees. Shrimpers' acceptance of conservation and increasing tolerance for regulations such as TEDs and BRDs indicates that with time, the fishing industry may be able to adapt to problems they currently face and consider to be more severe, or problems that have yet to develop.

Local Ecological Knowledge

Fishers' local ecological knowledge (LEK) is vitally important in moving forward to ensure that Georgia's commercial fishing industry continues to survive. The literature discusses the contributions LEK can make to understanding the environment and creating better management practices (Maurstad 2002; Berkes and Seixas 2005; Griffith and Pizzini 2002). During multiple interviews, there was strong evidence of fishers' specialized knowledge, unique perspectives, and insights that make them valuable collaborative partners for researchers in ways that may be mutually beneficial. As one

shrimper stated: “If you don’t include a commercial fisherman in the research part of it, then you don’t get what’s going on out there because we’re out there 24 hours a day, seven days a week. Professors [are] out there one-tenth of that time, make one-tenth of the knowledge. It’s one-tenth of the data. All they have to do is ask them, our commercial fishermen.” While this opinion may not be shared by all in the commercial fishing industry, the fact that it is present suggests that collaborative efforts between shrimpers and researchers might increase, which could lead to more accurate data being used to guide policy and regulations that would likely be more effective if based on more accurate scientific information.

The above shrimper is one of many to assert that the knowledge and assistance fishers could provide researchers with would prove incredibly valuable. Commercial fishers work on the water, catching fish and observing the environment around them every day. As such, if they were included in the research and policymaking processes, they could help provide a more complete view of the environmental situation. However, whether all actors recognize this and would be willing to collaborate is unclear. The development of a more collaborative relationship may result in a greater wealth of scientific information gathered by the fishers themselves. With more data to learn from and guide policy, it is possible that future regulations shaped by collaborative research between fishers and policymakers may better account for both the scientific and human aspects of fisheries management.

The Complexity of Implementing Solutions

Implementing solutions that go beyond survival and allow fishers to thrive, rather than simply “get by,” and effectively tackle issues in a way that is appropriate to all

actors involved is complex. While certain problems (i.e. imports negatively affecting shrimp prices) may hurt most of the industry, the problems facing the industry are ultimately subjective and their severity is largely dependent on a fisher's circumstances. It follows that there are disagreements among coastal Georgia fishers as to which currently implemented solutions have been the most beneficial.

Some praise marketing for emphasizing domestic shrimp while others point out its dangers: as shrimp becomes increasingly popular, imported seafood becomes more desirable to seafood sellers for economic reasons, which can hurt Georgia fishers. Others question marketing's impact on shrimp prices entirely, as the impact of marketing on shrimp or seafood prices is not directly measurable due to the many factors that influence prices. Additionally, some shrimpers praise tariffs while others express disappointment and dissatisfaction with the restitution process that has since ceased. Disagreements about problems and solutions may make implementing solutions more complex, but identifying and implementing the more effective solutions may help Georgia's commercial fishers continue to survive.

Lack of Support

The commercial fishing industry of coastal Georgia experiences lack of support on multiple fronts: internally, publicly, from restaurants, and from the government. As noted by Pollnac and Poggie (2008), individuals with active, adventurous, aggressive, and courageous personalities who are potentially prone to oppositional behavior are attracted to the dangers and challenges of fishing; hence, fishers can be independent, and difficult to organize, making it hard for them to work together. Several interviewees noted the difficulties of trying to get fishers to organize, such as to try and fight for better

prices. If fishers' aversion to organizing continues and their working conditions decline, it will be challenging for them to come together and advocate for themselves.

Internal lack of support also stemmed from the complicated relationship fishers seem to have with fish houses, which are an integral part of the fishing industry. Fishers' feelings ranged from obligation due to lack of other docking options to dissatisfaction with the amount of money the fish houses received from the tariff compensation process. Because of the competitive nature of fishing, fishers' independence and personalities (Pollnac and Poggie 2008), and their complicated working relationship with fish houses, lack of support from within the fishing industry itself persists.

Lack of support from the public is also evident. Fishers feel the public's negative perceptions of them and their impact on the environment have not changed since fishers first started receiving negative publicity for their environmental impact. However, the data indicates fishers are indeed conservation-minded. It is important that the public is aware of this to make more informed purchasing decisions. Failing to understand the differences between domestic, wild-caught seafood and other available options, and perpetuating false beliefs about fishers' negative impacts on the environment may encourage the public not to buy local seafood. However, if the public were more educated about the industry and the ways in which fishers contribute to environmental conservation, they could choose to support the industry by buying its products.

Several interviewees discussed how restaurants can be purposefully deceitful by marketing and selling imported seafood as a domestic product. According to one, "It's deception." This deception harms the fishing industry by misleading consumers and preventing them from making more informed decisions. Many fishers felt that if the

public knew more about the differences between their product and some imported ones they would be more willing to pay the slightly higher dollar amount for wild-caught, domestic seafood. If this was true, a greater demand for domestic seafood would help improve product prices (one of the most severe problems among the interviewees and especially the shrimpers), benefitting the local fishing industry and economy.

Fishers also perceived governmental lack of support, as they feel politicians do not care about them because of the industry's lack of resources, lobbyists, and money. It seemed interviewees' main complaint with regulations was that they were not very effective at achieving their intended goals when put in practice, and took neither the industry's needs nor fishers' knowledge into consideration. However, the literature does include cases of governmental support for fisheries (Pitchon 2011; Berkes and Seixas 2005). This suggests collaborative efforts can be successful, providing hope for future relations between Georgia's fishing industry and the government. If more collaboration between Georgia's industry and fisheries management developed, regulations that consider both the scientific and human needs of fisheries could be implemented and help fishers and the industry survive.

Resilience

There is evidence of resilience in the coastal Georgia fishing industry in response to competition from imports and stagnant shrimp/product prices. Lack of support as discussed previously is another issue fishers must contend with. According to Johnson, Henry, and Thompson (2014), resilience in the fishing industry can manifest in the following ways: (1) survival; (2) diversification; (3) getting by; (4) social identity; (5) optimism. During the interviews, many fishers recounted examples of resilience they

observed in their communities, including entering new fisheries, straying from traditional market methods, optimism and hope for the future of the industry, and actively pursuing positive change to adapt, survive, and get by during difficult times. This change could be in the form of using new equipment like fiberglass boats that are easier to maintain in the long run compared to wood boats, or creating new school programs geared at educating students about the fisheries and how working for them is a viable career option.

Resilience is a common theme in fisheries literature, suggesting this is not unique to coastal Georgia commercial fishers, but a deeper characteristic of fishers and their determination to survive the hardships they must face (Pitchon 2011; Blount 2007; Blythe 2015; Adger 2005; McConney, Cox, and Parsram 2015). The problems facing the industry are not new problems as fishers have dealt with TEDs and imports for years. However, the resilience that allowed them to get by and remain optimistic despite these problems remains in the industry and will likely prove instrumental for the continuation and future success of the industry, making Georgia's fishing future is a hopeful one.

Limitations

This study and the results would benefit from a larger, more representative sample size and additional study sites. Conducting more interviews and using additional sampling techniques, such as dock interception, could have resulted in a larger, more representative sample size, making the results more valid. The sample size limits the generalizability of the findings, as the experiences and needs of fishers in other fishing communities will likely differ from those presented here. Additionally, the problems and solutions presented to the interviewees in the card-sorting interviews were by no means exhaustive. There are many other problems members of Georgia's commercial fishing

industry must contend with, as well as solutions that were not included in this research.

Conclusions

Marketing that emphasizes domestic shrimp could potentially help combat the two most severe problems identified by the fishers in this study, low shrimp (product) prices and competition from imported seafood. If consumers were more aware of where their seafood came from and how it was harvested, it may push them to opt for domestic shrimp and seafood products when shopping, helping increase the demand for domestic products. In addition to emphasizing domestic seafood products, marketing that promotes fishers' acceptance of conservation might help increase public support for Georgia's fisheries. Increasing marketing may therefore help alleviate stress placed on fishers and their livelihoods from low prices and competition from imported seafood.

Additionally, if fishers take on a more active role in seeking and implementing solutions that they consider helpful and have some level of control over, such as marketing and cooperation with policymakers, their situations may improve. For example, fishers do not always want to become overly involved in fisheries management, but doing so is a choice they can make that they may find beneficial. Fishers may also choose to market their own product at their own desired prices (although private docking is extremely limited so doing so may be difficult) or attend more outreach events to help educate the public. Fishers may not have much control over a solution like tariffs, but if they become more involved with other solutions they may see benefits more quickly. However, increasing fisher participation in these endeavors will likely take time.

Lastly, resilience, a common theme in both the literature and this data, is key for the future of Georgia's commercial fishers. The interviewees have shown that they can

survive, diversify, get by, adopt fishing as part of their social identity, and remain optimistic throughout their careers. Fishers deal with many problems, but those who have overcome them and been able to keep fishing are examples of resilience. This resilience in the industry and its members indicates that Georgia's fishing industries could have a long and successful future providing fresh, wild-caught, domestic seafood.

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Appendices

A. Informed Consent



COLLEGE OF Behavioral and Social Sciences

DEPARTMENT OF Sociology and Anthropology

Informed Consent

1. We are Julia Thomas and Erin Scooler, and we are students in Georgia Southern University's Honors Program. We are completing this research as a part of our Honors Theses.
2. Purpose of the Study: The purpose of this research is to identify various problems facing commercial fishermen in coastal Georgia fishing communities as well as pinpointing their proposed solutions through the use of qualitative semi-structured interviews, freelistings, and card sorting interviews.
3. Procedures to be followed: Participation in this research will include completion of an audio-recorded interview about your thoughts on the problems facing the industry and their possible solutions. During the freelist portion, we will ask you to list any and all problems you believe are affecting the industry, then list potential solutions. We hope that you will choose to participate in a second interview next month when we will give you cards with various problems and solutions printed on them and ask you to answer questions using those cards.
4. Discomforts and Risks: The risks involved in this project are believed to be no more than those encountered in daily experiences.
5. Benefits: There is no direct benefit for participating in this study, however, there is a possibility you may indirectly benefit from the publication and presentation of the findings of this research.
6. Duration/Time required from the participant: 30-60 minutes per interview for 1-2 interviews depending on your interest.
7. Statement of Confidentiality: This study will be confidential, and we will not share any identifying information (such as your name) with anyone.
8. Right to Ask Questions: Participants have the right to ask questions and have those questions answered. If you have questions about this study, please contact the researchers named above at (561) 236-3122 (Thomas) or (912) 433-0382 (Scooler), or the researcher's faculty advisor, Dr. Jennifer Sweeney Tookes at (912) 478-6587. For questions concerning your rights as a research participant, contact Georgia Southern University Institutional Review Board at 912-478-5465.
9. Compensation: There is no compensation for participating in this study.
10. Voluntary Participation: You do not have to participate. You may refuse to answer any and all questions, and can walk away at any time before, during, or after the interview.
11. Penalty: There is absolutely no penalty for not participating in this study.
12. You must be 18 years of age or older to consent to participate in this research study.

B. Interview Questions**Semi-Structured Interview Questions (Primary Interview)**

1. Can you tell me about your experiences as a commercial fisherman in coastal Georgia?
 - a. How did you get into fishing? What is your daily routine like?
2. What changes have you seen happen in fishing/shrimping/managing a dock throughout your time in the industry?
3. Why do you think these changes have occurred?
4. Which of these changes do you think were positive? Were not positive?
 - a. Do you think anything can be done about these changes?
5. What would you like to see happen to the industry in the future?
6. Who, if anyone, could try to help fix the problems that are facing your industry?
 - a. DNR, NOAA, UGA Marex, or any other government agencies?
7. What are your thoughts about imported seafood?
 - a. Do you feel imported seafood has any impact on your success in the fishing industry?
 - b. Have you noticed any increasing competition from foreign markets?
8. Where do you think the imports are coming from?
 - a. How do you know this? What do you know about these imports and their quality?
9. What do you think might happen to the American fisheries as a whole if foreign seafood continues to be imported at the same rate?
 - a. What if imports increase?
 - b. What if the cost of foreign imports decreases?
10. I've heard a lot about a seafood dump in the early 2000s. Can you tell me about this event?
 - a. What happened next?
11. Has there been any sort of compensation for this?
 - a. Can you tell me how the restitution worked?
 - b. Do you feel that the fishermen within the community have been fairly compensated for the "dump" of cheap seafood from foreign markets?

- c. Do you feel like those within the fishing community share your thoughts on how the restitution process was handled?

Free listing prompt

We'll be asking you two sets of questions. First, we will be asking you to list the problems you have noticed. We'll be writing down your answers in a list, and many will most likely have been mentioned in our earlier conversation which is okay. We are trying to fit the big issues you have experienced into small phrases.

1. Can you list any and all problems that the fishing industry here is facing?

Now we will be talking about what you think are potential solutions.

1. Can you list any and all solutions you think could help the commercial fishing industry in Georgia?

Semi-Structured Interview Questions (Secondary Interview)

I am holding cards based on the responses from previous interviews. The first set have problems listed on them. We will ask you to arrange them in various ways according to the following questions.

1. Can you arrange the problems in order from what you consider most to least severe?
 - a. Why do you think these problems ranked towards the top are the most severe?
 - b. Why are these problems you have ranked towards the bottom not as severe?
 - c. Have these problems at the top always been the most severe issues facing the fishing industry?
 - d. Have the problems at the bottom always been the least severe issues?

The next set of cards have various solutions listed on them. We will ask you to arrange them in various ways according to the following questions.

1. Can you arrange the solutions in order from what you consider most to least helpful to the industry as a whole?
 - a. Why do you think the solutions at the top are most helpful to the industry in general?
 - b. Why are the solutions at the bottom less helpful than those at the top?

- c. Have these solutions at the top always been the most helpful?
- d. Have the solutions at the bottom always been the least helpful?

Now we will combine both the problem and solutions cards and ask you to arrange the solutions you think would be helpful for each specific problem.

This will be completed for each individual problem.

1. For this particular problem, what solutions do you think would be helpful in solving that problem? Feel free to pick as few or as many as you think are helpful.
 - a. Can you rank the solutions you picked out for this problem in order from most to least helpful?
 - b. Why are the solutions at the top the best ones for solving this particular problem?
 - c. Why are the solutions at the bottom less helpful?
 - d. Why are the solutions you didn't choose not helpful for this problem?