

A Social History of Spiny Lobster Fishing and Management in the Florida Keys: Lessons for Sustainable Fishing Communities

Una Historia Social de la Pesquería de Langosta Espinosa Comercial de los Cayos de Florida y Efectos de Gestión: Lecciones para las Comunidades Pesqueras Sostenibles

Histoire Sociale de la Pêche Florida Keys Commercial Épineux de Homard et Effets de Gestion: Leçons Pour les Communautés de Pêche Durables

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ABSTRACT

This study reviews the history of the Florida Keys spiny lobster fishery, especially after the State of Florida implemented a market-based, effort reduction program in the 1990s. The study evaluates the impacts of the program on the fishery's participants, their communities, and social networks, examining how the diminution in the fleet and its participants has affected the region's fishing industry and promoted waterfront conversion and gentrification. It is argued that by ignoring the social dimensions of fisheries, market-based programs have weakened the underlying social capital in fishing communities, facilitating fisher exit and waterfront transformation. If coastal regions such as the Florida Keys, which are experiencing increasing higher waterfront prices and cost of living conditions, are to maintain local fisheries and vibrant fishing communities, then management strategies must incorporate the social dimensions of fisheries as part of a comprehensive management agenda.

KEY WORDS: Commercial fisheries, Florida Keys, spiny lobster, social capital

INTRODUCTION

Fisheries, which experienced a significant growth period in the decades following the end of World War II (Weber 2002), have in most coastal and many pelagic sectors commenced to flatten out or, worse, spiral downwards (Worm et al. 2009). Capacity in many of the world's fisheries is greater than what is required for maintaining sustainable landings, driven by market distortions, demand, and subsidies (Sumaila and Pauly 2007). A frequent explanation ascribed to the overfishing problem is the inability of fishers to control the effort of their cohorts, commonly referred to as the tragedy of the commons (Hardin 1968). As a means by which to remedy the problem, management in many fisheries sectors has adopted forms of property rights and dedicated access programs that allow fishers to determine the optimal level of effort (based on market demand, resource availability, and alternatives, among other factors), prevent derby fishing and, most importantly, prevent overfishing (Costello et al. 2008).

Market-based and related regulatory approaches that reduce effort and/or create dedicated quotas have met with increasing opposition, however, based on the impacts that such approaches have on effort or quota concentration, effects on smaller operations, and long-term changes in fishing communities, among others (Olson 2011, Bromley 2009). Others, such as Jentoft (2000), have argued that the reductions in fisher participation that are forced through regulatory measure run the risk of both removing participants who play a disproportionately important role in their respective communities and decimating fisher levels to a critical point beyond which fishing communities erode and fisheries decline. Symes and Phillipson (2009) argue that sustainable fisheries management is "*a three legged stool embodying environmental, economic and social sustainability: dangers arise when one of these legs is weakened by neglect*".

My argument adopts Symes and Phillipson's (2009) three legged stool model to demonstrate how the downgrading of social objectives, namely the promotion of participation, communities, and networks, has weakened the Florida Keys commercial spiny lobster fishery into enclaves of vertically oriented producer centers and opened up the waterfront to the vicious circle of displacement and gentrification. I discuss how this transformation was not forced on the fishery because of overfishing but was instead a result of the prioritization of economic (and especially privatization) objectives over social ones. I show how once the privatization and reduction scheme was implemented in the region, it at first slowly and then more rapidly forced the deterioration of fishing communities and exit of a majority of the spiny lobster fishing operations. I discuss the importance of social capital in fisheries (Grafton, 2005), and how its erosion via privatization measures has led to the decline of commercial fishing in the Florida Keys.

The Commercial Spiny Lobster Fishery in the Florida Keys

The Florida Keys has a long history of commercial fishing, extending back to when the islands were under Spanish rule and then with the rise of the Key West - Havana reef fish live trap in the mid-19th century. While Key West, the southernmost island in the chain grew in population due to its strategic position in between the Florida Straits and Gulf of Mexico,

the other keys remained largely undeveloped until after the completion of the Overseas Railroad (Viele 1996). Known as the 8th Wonder of the World, the Florida East Coast (FEC) extension connected the keys with mainland Florida and, effectively, the rest of the US (Zeiller 2006). Spiny lobster, a decapod crustacean, which was usually landed for local markets and as bait for the then more lucrative reef fish (Moe 1991), grew in popularity as a delicacy in northern markets as its accessibility increased in the railroad era. Whereas less than 30,000 pounds were landed in the late 19th century, the fishery grew to over a million pounds the decade after the final railroad tracks were laid in Key West (Labisky et al. 1980). Along with king mackerel, spiny lobster rose as a major export product from the Florida Keys (Little 2000).

While the Great Depression and World War II both depressed spiny lobster production, lobster landings increased for both the growing regional population (in the Florida Keys and South Florida) and through greater demand in the rest of the US (Labisky et al. 1980). The fishery expanded outward to the Caribbean and Atlantic Ocean as larger vessels and improved technology entered the fleet, and by the 1960s, a large percentage of the total harvest was landed from the Bahamas (Moe 1991). In 1975, the Bahamian government claimed a fishery exclusive zone for its citizens, causing the US effort to relocate in Florida waters. While the fishery gained exclusive access of its own with the creation of the 200 nautical mile fishery conservation zone under the 1976 Fishery Conservation and Management Act (now the Magnuson-Stevens Act), landings never reached the peak years when the fleet fished Bahamian grounds (Weber 2002, Milon et al. 1998).

The excess effort that had returned into the Florida Keys due to the moratorium of foreign fishing in the Bahamas led to a precipitous decline in the economic efficacy (measured in catch-per-unit-effort (CPUE) of the main gear type (Milon et al. 1998), which had been the wooden-slat trap since the 1940s (Moe 1991). However, lobster traps increased in the fishery throughout the 1980s until the trap totals reached or even exceeded an estimated million traps. By this time, it was clear that existing regulations had been unsuccessful in addressing effort (and capacity) issues, and the State of Florida, which manages the spiny lobster fishery with support from federal Gulf of Mexico and South Atlantic fishery management councils, considered a variety of management alternatives to reduce trap totals (Shivlani and Milon, 2000).

In 1991, the Florida Legislature passed the Spiny Lobster Trap Certificate Program (TCP), which was crafted to create stability in the fishery by reducing the total number of traps (FS 370.142). The program apportioned trap certificates across participants based on the highest single-year harvest in the three years leading to the passage of the program with a individual trap total maximum based on a trap/catch coefficient. Based on the number of

certificates awarded, fishers could purchase trap certificate tags from the State of Florida's fishery management agency (now the Florida Fish and Wildlife Conservation Commission, or FWC), affix the tags to their traps, and fish those traps for the season. To achieve its objective of promoting catch efficiencies, or increasing CPUE, the program also contained a trap certification reduction feature via which the FWC could reduce up to 10% of the total traps in the fishery per year. The feature was later modified to an annual 4% reduction, based on a combination of active (where the agency retired trap certificates) and passive (where 25% of trap certificates are retired when first sold outside the immediate family or if certificates have been idle for multiple years) reductions. The TCP's market mechanism was the allowance of trap certificate sales and leases in the industry. The FWC eliminated leasing from the fishery effective in 2003 following concerns of issues such as absentee landlordism, but the sales of trap certificates remain an important part of the fishery (Shivlani et al. 2005). While sales do result in a surcharge, which is considerably higher the first time a certificate is exchanged, subsequent sales require much lower surcharges.

The State of Florida implemented the TCP in 1992, allocating a total of 727,313 certificates, with an additional 108,178 certificates added through individual fisher appeals to the Advisory and Appeals Board (Matthews, personal communication). The FWC reduced the number of trap certificates by 10% each over three seasons in the 1990s, achieving a total reduction of 35% (Milon et al., 1999). Over the 2000s, when the FWC adopted the 4% reduction schedules, trap certificates were reduced by 10.3%. Over its first two decades, the program succeeded in reducing 42% of the traps in the fishery, from 835,471 in 1992 to 486,515 in 2011 (Figure 1) (Matthews, personal communication, Vondruska 2010). Participation in the fishery declined considerably as well, as measured by the decline of 61% of the spiny lobster permits issued for

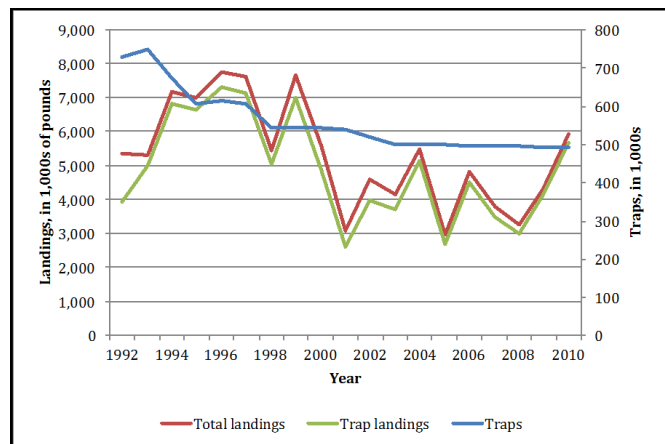


Figure 1. Florida spiny lobster landings, landings by trap, and total traps (adopted from Vondruska 2010).

Monroe County (Florida Keys) from 1991 to 2008. In 1991, there were 1,584 spiny lobster permits in the county; by 2008, there were 628 permits in the county (Figure 2) (FWRI 2009). The TCP had achieved one of its objectives, which was to reduce the total number of traps, but it had done so at the cost of decimating the fishery and, as shall be shown below, promoting the disintegration of the region's fishing communities and networks.

The Social Dimensions of Florida Keys Fisheries

Prior to discussing the importance of the social dimensions of the Florida Keys fisheries, it is important to consider why social dimensions matter at all in fisheries management. The twinning of ecological sustainability (exemplified via the maximum sustainable yield concept) and economic efficiency (exemplified via the maximum economic yield concept) has evolved to promote a bioeconomic solution, based on sustainable harvest and efficient operations, that has little to no place for social parameters (see Shvllani, 2014, for a broader discussion on the evolution of this approach). The social dimensions are malleable under this approach, in that fishers and their respective communities can be acted upon and be expected to rebound once the effects of the approach have been realized.

This is best exemplified by Jentoft's (2000) discussion on sustainable fishing communities, in which he argues that there are two ways to view participation, which is often considered an indicator of effort in fisheries and which is invariably targeted for reduction as a means by which to achieve ecological and economic objectives. Jentoft argues that participation can be viewed as a success or failure depending on how management views the role of fisheries and their communities. If fishers are considered as part of an interdependent system, where each fisher represents a unit of undifferentiated effort, then reduced

participation simply results in the eradication of excess units of effort and a new equilibrium. If, however, fishers are considered to comprise a functional system, in which certain fishers serve roles in their communities other than effort, then once fisher totals are reduced to a critical mass, further decline consigns their communities to an irreversible decline and impacts fisheries sustainability. This functional system is best explained in terms of social capital.

Social Capital

Social capital is often described as a stock unique to groups and which is similar to the stock present in other types of capital, including physical, human, and natural capital (Field 2011). Putnam (1995) has defined social capital as the features of social relations that extend to trust, norms, and networks and result in coordination and cooperation. Pretty (2003) evaluated the role of social capital in the management of natural resources and found it as a necessary corrective in many instances to the dominant, common property ideologies that espouse governmental oversight or privatization. For Pretty and others, social capital is based on trust, an important feature in the collective management of common property resources. Repeated interactions in a series in formal and informal networks reinforce trust and build connections, promoting a shared agenda that relies on cooperation and sanctions bad actors (Pretty 2003).

Social capital is of great importance in commercial fisheries, a sector that functions in a common property system and which relies on collective management and requires intra and inter-group trust and cooperation (Grafton 2005). In the Florida Keys, the spiny lobster fishery is part of a multi-species complex in which fishing communities participate from Key Largo through Key West. Fishers within their respective communities have relied on information and cooperation with their cohorts in a form of social capital known as bonding capital. Fishers have also joined ranks across the island chain for collective action initiatives, which is commonly referred to as bridging social capital. Finally, several fishers have built durable and long-standing relations with agency officials and decision-makers in the form of linking social capital. Each of these relationships and the networks they engender have required repeated interactions that have built trust and cooperation, resulting in lowered transactions costs.

The TCP and Changes in Social Capital in the Florida Keys Spiny Lobster Fishery

The TCP, when it was passed in 1991, did not differentiate between fishers more so than the units of effort each fishing operation represented. Thus, the TCP, like many other market-based reforms in fisheries management, misidentified fishers and their communities as parts of an interdependent system. The expectation was that the most competitive units would displace the least competi-

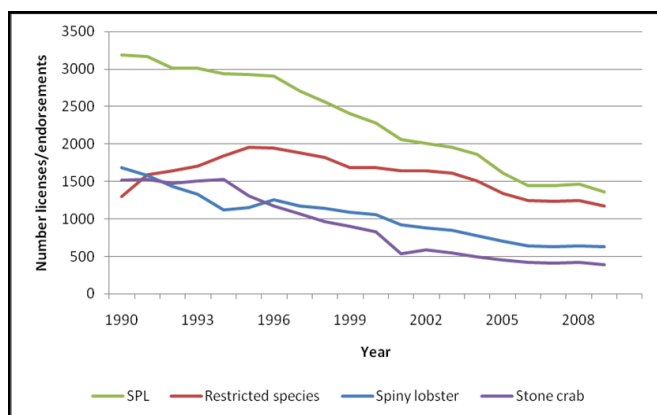


Figure 2. Florida Keys (Monroe County) commercial fishing licenses and endorsements: 1990 - 2009. (Source: FWRI, 2009)

tive ones, thereby achieving the vaunted bioeconomic equilibrium. Clearly lost in this calculus was the fact that fishers are not identical and thus cannot be replaced with one another, that continued participation and interactions played an important role in building and sustaining trust, and that the decimation of the putatively less than high-liner population of fishers would undermine the existing social capital. The changes in the fishery manifested themselves in the following ways: Loss of fish houses (processors) and working waterfronts; barriers to entry and the graying of the fleet; vertical re-orientation and effort concentration; community fragmentation; and waterfront transformation, and gentrification.

In 1995, there were 32 fish houses and numerous other fish retail establishments dotted along the Florida Keys (Milon et al. 1997). By 2005, 22 of these fish houses had been closed down, and the locations of several of these fish houses had been changed into private marinas, waterfront restaurants, and residences (Shivlani 2009). In Stock Island, the center for Lower Florida Keys seafood production, the number of fish houses declined from 10 in 1995 to only two in 2005 (Shivlani 2009). As the number of fish houses declined, so did fish house affiliation. In 1995, 72% of the commercial fishers in the Florida Keys were affiliated with a fish house; by 2005, only 47% belonged to a fish house. The reason why these declines matter is because fish houses are more than wholesale processors. Fish houses are centers of fisher activity and congregation, providing a variety of facilities and services, and serving as areas where fishers can communicate and exchange information. Due to the lack of waterfront availability in parts of the Florida Keys, especially the Lower Keys, fish houses in that region provide invaluable dock space and slips, storage facilities for traps, nets, and other gear, and a dedicated buyer. Fishers often obtain information on upcoming regulatory amendments and other changes through fish houses and in communication with other fishers at the fish houses. Fish houses are also excellent places for fishers to get insights on product, vessel, and gear costs, and to be able to recruit mates for fishing trips.

As regulatory changes such as the TCP began to push fishers out of the fishery, fish houses lost many of their most prolific fishers (Bacle, personal communication) and began to experience a decline in supply that they had relied on to cover their costs. While this did not occur in all fish houses (indeed, some fish houses actually benefitted from the TCP by attracting large fishing operations from other fish houses), the net effect was a vicious circle of fisher exit and fish house closure. As a threshold number of fishers left the fishery, fish houses were forced to either diversify into other fisheries to cover their supply or to close down. As more fish houses selected the latter option, this left less waterfront space available for the displaced fishers, which in turn promoted more fishers exiting the fishery.

Another major impact to the social dimensions of the fishery resulting from the TCP was the creation of an effective barrier to entry and the dissolution of the apprenticeship system (Shivlani and Milon 2000). Young mates in the past had been able to work their way into the fishery, by apprenticing with captains and slowly building trap totals to start their own operations. This system allowed for the transfer of traditional ecological knowledge, generated social capital due to durable captain-mate partnerships, and allowed for a reasonable turnover. With the advent of the TCP, mates now had to buy their way into the fishery, which became cost prohibitive. By 2013, an entrant wanting to start a 1,000 trap operation would need to pay \$85 per certificate (Kelly, personal communication) and \$35 per trap, or \$120,000 just for the gear. This would not include the cost of the vessel, dock slip fees, trap storage fees, and the annual cost of \$2 per certificate. Thus, over the program, the fishery has experienced a 'graying of the fleet'. In 2005, the average age of a Florida Keys commercial fisher was significantly higher than it was ten years before, and there were fewer fishers aged 30 years or younger than in the past (Shivlani et al. 2008).

While it could be expected that an effort reduction program would re-orient the fishery from many, smaller operations to fewer, larger operations, the net effect was that even many medium-sized operations exited the fishery over the TCP. In 1995, fishers held an average of 1,926 spiny lobster and stone crab traps; by 2005, they held an average of 3,000 traps, representing an almost 35% average increase per operation (Shivlani et al. 2008). This re-orientation matters because it transformed the traditional orientation of the Florida Keys fishing industry, which had been dominated by fishing communities comprised of mainly medium-sized owner operators, many of whom fished because it represented a way of life and not solely a profit-maximizing venture. It created a system in which only the largest operations could thrive, which was less egalitarian, and which offered less upward mobility.

With the forced reduction in effort, barriers to entry and upward mobility, and closure of fish houses, fishers and fishing communities accelerated their decline in the 2000s. Data collected over that period with commercial fishers, fish houses, and other coastal and marine stakeholders showed that fishers had very low levels of confidence in fishery programs and low assurances that fishers could counteract regulatory decisions (Shivlani 2009, Shivlani et al. 2008, Shivlani et al. 2005). In 2005, a Florida Keys newspaper, the *Keynoter*, described the large-scale exodus of fishers from the region to central Florida horse country, labeling the flight the "Horse Conch migration" (Ball 2005). Fishing communities across the islands, from Key Largo to Conch Key to Stock Island, experienced losses in participation as both recent immigrant fishers and multi-generational fishers left the Florida

Keys. While it cannot be definitively stated that this represented Jentoft's (2000) threshold for the demise of fishing communities, it was nevertheless a pivotal moment in the decline of fishery culture in the Florida Keys.

Finally, the cumulative impacts of the TCP must be considered as both an illustrative example and a cautionary lesson. Once the fish houses, fishing operations, and fishing communities commenced their decline, which accelerated in the mid-2000s, the open spaces were left open to forces in favor of waterfront conversion and gentrification. Monroe County scrambled over this period to protect vanishing working waterfronts, first by establishing a moratorium on waterfront conversion sales and then by developing a Working Waterfront Preservation Master Plan (Monroe County 2011). Participation in commercial fisheries, including the spiny lobster fishery, nevertheless declined by 26% from since when the county commenced with its efforts. Gentrification had started to take hold because the pernicious effects of the TCP and related effort and participation reduction measures had been enacted with the view that fishers and their communities were interdependent and thus interchangeable (Shivlani 2014). The cascading and likely irreversible impacts of management measures that ignore the social dimensions of fisheries are not unique to the Florida Keys. These effects can and do take hold in other areas where fisheries exist in an uneasy peace with other, competing uses and demands in and for the limited waterfront (Colburn and Jepson 2012). What the results from the TCP experience demonstrate is that fisheries do comprise a functional system, and that a two-legged stool that embraces ecological sustainability and economic efficiency while ignoring social dimensions is likely to fail.

CONCLUSIONS

What can the TCP teach us about sustainable fisheries? As noted above, there is a need to view fisheries holistically, as a sum of their ecological, economic, and social parts. Also, fishers and their communities need to be included as agents who are responsible for and are active in the management actions that will affect their future and, as such, the future of the waterfront they inhabit; they cannot be relegated to objects upon which actions are taken and whose impacts are then measured and mitigated for. Their relationships and networks need to be acknowledged as important assets, comprising forms of social capital. Cooperation, an integral part of social capital, is too often ignored in favor of competition. In the end, it is a matter of choice. As argued by Bromley (2009), property rights do not determine sustainable fisheries. Instead, sustainable fisheries are achieved by robust fisheries research leading to accurate allowable catches. After that, how we as a society decide to divide that catch becomes a matter of choice. The contention that fisheries must elevate competition above cooperation, economics over social welfare, and less participation over more participation is part of that

choice. If the choice ends up being that we prefer fewer, larger operations and a less diverse waterfront, then we are on the right track. If however we prefer a more diverse waterfront and various classes of fishers, then we must reconsider how we manage our fisheries.

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