

10-28-2006

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THE CULTURAL EVOLUTION OF COMMERCIAL FISHING COMMUNITIES

A Research Paper Focusing on the Effects of the Government Regulations on a Business and Social
Community's Culture

A Comparison of Current Research on the Cultural Evolution of the Commercial Fishing Community

Paper for the 2007 SAM Conference

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October 28, 2006

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THE CULTURAL EVOLUTION OF COMMERCIAL FISHING COMMUNITIES

A Comparison of Current Research on the Cultural Evolution of the Commercial Fishing Community

Anthony E. Baker – Providence College

Abstract

This paper uses a *Case Study* method to examine the phenomena of cultural change within Commercial Fishing Communities (CFCs). Points of discussion include some of the basic principles of entrepreneurship such as risk, succession, and benefit to communities. Included is a focal discussion that reflects on past business models in comparison to newer possible models that detail the potential for extending the participation of family fishing business through innovation and diversity. A primary objective of this paper is to determine if alternate methods to govern a natural resource are viable. This includes research of the effect of past, present, and proposed regulations on traditional business models. A secondary objective examines if the external driver of current government regulatory practices, (which evidence shows have moved an industry of what was once many small independent owners, towards fewer larger business) is a component of modern business evolution, or a deliberate act by various organizations to consolidate the wealth of a specific natural resource once shared by thousands.

During the course of the research, perspectives of social and culture change when contrasted with fisheries management are detailed from the perspectives of various stakeholders. In doing so the paper examines the socio-cultural development of the CFC over time. It also analyzes the effects of internal and external drivers on the socio-cultural evolutionary course of CFCs. Key areas of economics, norms, values, ethics, and heritage are examined in an attempt to find successful alternatives for possible evolutionary paths.

Introduction

The Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA) of 1996 was created in response to the affects of the 4th listed driver on fisheries stocks in order to nullify declines and rebuild them for future generations. It was developed with strategic considerations for issues concerning CFCs and addresses these issues from the outset:

“...take into account the importance of fisheries resources to fishing communities in order to [A] provide for the sustained participation of such communities, and [B] to the extent practicable, minimize adverse economic impacts on such communities.” (Magnuson-Stevens Fisheries Conservation and Management Act, 16 USC, Section 1851)

Thus, this law will be a crucial discussion point through out this paper. It is important to understand how the MSFCMA defines CFCs as communities.

“...a community which is substantially dependent on or substantially engaged in the harvest/processing of fishery resources to meet social and economic needs, and includes fishing vessels owners, operators, and crew and United States fish processors that are based in such community.” (Magnuson-Stevens Fisheries Conservation and Management Act, 16 USC, Section 1851)

Using data compiled by current research of a cross section of CFCs both in the US and abroad, an analysis will be conducted to determine similarities and differences of these various CFCs.

The Effects of Socio-Cultural Evolution of CFCs on Fishing Ports

Numerous reliable authors have documented the changes occurring within the cultural fabric of CFCs internationally. When comparing data gathered from these authors, with theories proposed by prominent socio-cultural researchers such as Lenski & Lenski (1970/74) and Steward (1955/76) on socio-cultural evolution, aspects of both *multilineal* and *unilineal* socio-cultural evolution theory can be accounted for. So regardless of which theory may or may

not be applicable in the case of CFCs, changes within this community have happened and are happening at a rapid pace. Both theories portray how drivers affecting one stakeholder in a community in turn, affects another in a form of *chain reaction*.

A CFC is comprised of multiple components of stakeholders each playing vital role in the others ability to exist. Active fishermen, who pursue and catch (harvest) seafood, require resources in various forms in order to do this effectively. Fishing vessels are now propelled by petroleum fuels (gasoline and diesel) so a supply of this fuel needs to be available at Commercial Fishing Ports (CFPs). These vessels require maintenance and modification regularly so facilities that are capable of doing this are required at CFPs as well. For much of a CFP’s fleet ice is still the main method for preserving the catch when transported to the CFP by fishermen and away from the CFP by seafood wholesalers; who also are stakeholders with facilities located at CFPs. Lastly, all the normal infrastructure that is required of any town or city, (power, communication, roads, education, healthcare, retail, etc) is also required to support a CFP. If any of these are in a crisis then a crisis exists for all. But when the crisis is severe for the focal point of a CFC, which is the fishermen, than crisis for the CFP is critical; because without the fisherman all the others are unable to exist (at least in their original form).

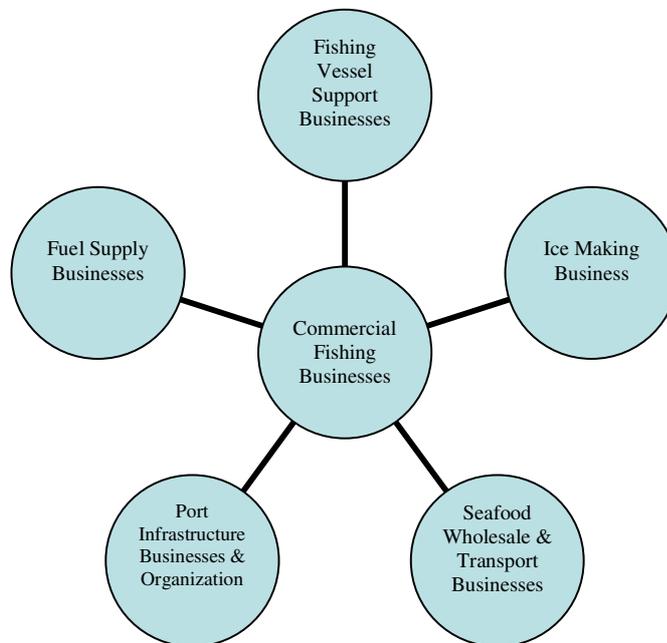


Figure 1 CFC Stakeholder Relationships

Bastianello (2002) describes what has become a typical outcome of the cultural change within a CFC as it affects a CFP. The CFP discussed by the author is Portland, Maine, which is the second largest CFP in New England. Descriptions of, “multiple inter-related factors contributing to its decline” (p. 253) are detailed in the research.

“The decline is felt by harvesters (commercial fishermen) and also processors (wholesalers) and vessel services such as ice and fuel suppliers. It even impacts the ability of the port to sustain its multi-million dollar physical infrastructure. The last has the serious implications regarding the capacity of the port to support fish landings.” (pp. 253-254)

What has happened to Portland, Maine should not be a surprise to any researcher, of any discipline, who has studied how communities change. Historically, communities have grown, declined and morphed into new forms for centuries, both on massive and smaller scales. What is unique today is how a community may attempt to take action as

drivers of change cause reactions. In the past technology has always been a major driver of change. As discussed earlier, it has been argued by esteemed authors that technology may be perceived as either a beneficial or detrimental (or both) driver. Thus the outcomes can be seen qualitatively as either positive or negative in their impacts. One could argue in the case of CFCs that their decline was brought on in good measure by the very technology that allowed them to grow. Over fishing of a common pool resource leading to decline in landings of seafood products caused by increasingly more efficient technology developed for the catching (harvest) of fish.

So the question can be asked, “can technology be used to sustain a community” in this case a CFC? A key psychographic trait of members of a CFC has been identified by Lenski & Lenski (70/74) is “flexibility.” Due to the element of having to deal with *nature* and its unpredictability as an everyday occurrence, other community stakeholders have likely acquired general psychological abilities to be able to make sudden and rapid changes as well.

Lauer (2001) describes how information technology that has created an environment for growth in other industries has caused growth in commercial fishing in New England. The author explains how a high demand has always existed for *sea urchins* in Asian markets, but was not until advances in information technology became widely used that wholesalers in Maine were able to create a business model, where this once discarded incidental catch has risen to such prominence that it is now only second to the renowned *North Atlantic Lobster*. “...harvesters landed more than 40 million pounds worth more than \$30 million dollars... thousands of people are working in the harvesting, buying and processing.” (p. 532)

The net effect of this was the ability of CFPs to continue to be able to sustain their existence and actually grow after what was a period of decline. A “gold rush affect” (Lauer, 2002) indeed happened. This can be detrimental as is evident by past declines in CFCs and CFPs as participants entered from other fisheries, as so often has been the case. Lauer (2002, p. 536) cites research by Emirbrayer (1997) and Granovetter (1985) that describes a deeply rooted psychological perspective commonly found in pastoral/agricultural and hunter/gatherer societies that must contend with forces of nature as substantial part of their daily lives. This flexibility to rapidly respond to natural forces in order to survive is easily translatable to economic drivers. CFPs both large and small in Maine (although not the previously discussed Portland) benefited from this combination of traits and technology.

The Formation of Distinct Sub-Cultures

Lauer (2002) cites in his research conducted earlier in 1999, also describes a divergence in the active commercial fishing stakeholders in a CFC. A substantial difference between inshore commercial fishermen [*fishing*] (ICF) and offshore commercial fishermen [*fishing*] (OCF) grew quickly from the mid 1950’s to present day. This is due in large part once again to the forces of nature and the uses of technology. He explains that those fishermen who choose to be ICF do so for qualitative reasons such as family life, perceived safety, and cultural heritage. ICF have a limited range due to use of available technology that does not allow them to stay at sea for extended periods of time and travel lengthy distances in pursuit of a specific target species or stock. So, they must be able to adapt to various species that in their natural migratory patterns are available in local waters and adapt to seasonal restrictions as to types and amounts of each species based on government fisheries management regulations. OCF stakeholder made most of their choices on quantitative reasoning based on economic opportunity being greater as OCF than ICF.

Lauer (2002) cites research by Dewar (1986) and Levine & McCay (1987) when detailing these findings as how ICF have adapted to these drivers by flexibility in harvesting of available target species. Advances in technology at several levels; from advancement in basic hand tools to hydraulics to advancements in electronics have enabled the ICF to be more flexible over time. Examples such as the proliferation of cost effective pneumatic hand tools, hydraulic deck equipment,

and various forms of electronics such as communication, radar or navigation systems have assisted both the ICF and the OCF.

But OCF have used them in combination with advances in nautical engineering and large amounts of venture capital available (much of it provided by US Federal Grants and Underwriting) to develop the ability to build commercial fishing vessels (CFVs) with extraordinary range never before possible. Post WWII shipbuilding facilities and technology developed for that war were converted to use by early venture capitalists to create an OCF industry that exists today as well as multiple coastal facilities that could support these vessels in numerous locations on any coast. No longer did a commercial fisherman have to maintain his ability to adapt to changes in species or economics. Tacit and explicit skills needed by all fishermen were only prevalent in ICF communities. Fisherman employed in OCF became more specialized in their knowledge, skills, and abilities. The cost efficiency of designing, building, maintaining and manning CFVs that could pursue a specific quarry or type of quarry as it migrated over thousands of miles was high. Volume production needed by volume processors decreased price but profits were still sustainable because of volume of landings.

What was found by Lauer's (2002) research is that ports that had a substantial number of ICF members in its CFC were more likely to be able to sustain themselves due to the higher ability required to be adaptable to ICF as opposed to OCF. Furthermore, it was more likely that CFPs that were dependent on only a few target species (IE groundfish, scallops, swordfish) that were pursued by OCF were more likely to see decline when and if a fish stock collapsed due to over fishing pressures brought on by high volume, targeted effort, that are the by products of OCF.

What has come from this is an increased competitive existence between the two subcultures of a CFC regardless of location. Hall-Arber et al (2004) for New England CFCs and Langdon-Pollock (2004) for Pacific Northwest CFCs describe the current situation in CFPs in both areas with striking resemblance. Both authors describe an ever increasing "burden" felt by both ICF and OCF in the wake of government mandated controls under the MSFCMA. While there are common arguments in opposition and even in support of many of the regulations the greatest cause of stress in the past decade has been between the ICF and OCF subcultures. Measures and methods for managing fisheries have evolved to the point where specific parties or persons are given allocations of a given percentage of what is estimated of a specific fish stock.

Langdon-Pollock (2004) explains how the Pacific Northwest region is using a method where a fixed tonnage of a target species is given to specific Licensed Commercial Fisherman (LCF) based on historical data of their landings in the past. While the formulas vary from state to state and even sub-region to sub-region the general rule followed is as follows:

1. A given time period is chosen that is believed to be representative of a group of Licensed Commercial Fishermen (LCF).
2. The landings are averaged during this time period for each LCF.
3. An estimated tonnage is determined by government (federal and state) fisheries managers of each total target species fish stock that is likely to exist in the wild that can be possibly caught (harvested) by all LCF. [Variable "A"]
4. An estimated tonnage is determined by government (federal and state) fisheries managers of each total target species fish stock that is likely to be required to remain after commercial fishing efforts to catch (harvest) a target species in order to maintain current stock levels or preferably to grow stock levels. [Variable "B"]
5. Variable "A" is subtracted by variable "B" and the remaining figure is a Seasonal or Annual Allowable Catch Limit (ACL) for a target species.
6. That amount is then divided into quotas that are allocated to individual LCF based on the percentage of catch they had historically had of that target species during that allocated time frame.

So to summarize by way of example; Langdon-Pollock (2004) explains that if from 1995 to 2000 a LCF caught 10% of a target species (EG halibut) in a specific coastal region (EG Northern Oregon) and the ACL for the year in discussion is 100 tons for that region than a LCF in that region would be allowed to catch no more than 10 % of that 100 tons or 10 tons. These are referred to as Individual Fishing Quotas (IFQ).

Hall-Arber et al (2004) explains how for New England CFCs a different method is used based on effort reduction. Allocation of amounts of effort measure by either *Days At Sea* (DAS) or *Traps In Use* (TIU) is then used to try and reach the same goal. While again the formulas vary from state to state and even sub-region to sub-region the general rules followed:

1. A given time period is chosen that is believed to be representative of a group of LCF.
2. The landings are averaged during this time period for each LCF.
3. Data in the form of DAS or TIU is gathered to determine the amount of effort is used to catch (harvest) a target species during that time frame.
4. A correlation of the total amount of DAS or TIU (depending on the method used to harvest a target species) used by a group of LCF during that time frame as compared to the total average annual or seasonal landings during the same time frame is created. [An example of this would be is that the data collected showed that an average LCF who owns a dragger (boat that uses a net) caught 1 ton of fish each day at sea, or an average LCF who owns a lobster boat (boat that uses traps) caught 10 pounds of lobster each year in each trap.]
5. An estimated tonnage is determined by government (federal and state) fisheries managers of each total target species fish stock that is likely to exist in the wild that can be possibly caught (harvested) by all LCF. [Variable "A"]
6. An estimated tonnage is determined by government (federal and state) fisheries managers of each total target species fish stock that is likely to be required to remain after commercial fishing efforts to catch (harvest) a target species in order to maintain current stock levels or preferably to grow stock levels. [Variable "B"]
7. Variable "A" is subtracted by variable "B" and the remaining figure is a Seasonal or Annual Allowable Catch Limit (ACL) for a target species.
8. The ACL then will determine how much *effort* can be used by LCF in a region to catch that ACL during a given time frame. (Normally annual.) That effort is then allocated to LCF in the form of DAS or TIU.

So to summarize by way of example, Hall-Arber et al (2004) explains that if the TAC for a given year is 100 gross tons of a groundfish and the average dragger catches 1 ton a day and a LCF who owns a dragger has a historical data showing that they catch 10 tons or 10 % of the TAC in a previous designated time frame, then they will get a 10 DAS effort allowance. 1 ton X 10 days = 10 tons, this is 10% of 100 tons of ground fish. Another example is if the TAC is 1 million pounds of lobster and the average lobster boat in a region catches 10 pounds per trap on average each year, and a LCF who owns a lobster boat has a historical catch of 10,000 pounds or 10 % of the TAC in a previous designated time frame, they will get an allocation of 1000 traps. 10 pounds per trap X 1000 traps = 10,000 pounds of lobster which is 10 % of the TAC.

While exceedingly more complicated this method is believed by many stakeholders to allow fisherman to put their best efforts forward. Rather than knowing that you will get a "specific amount" no matter how "hard you fish," a fisherman must still fish hard and smart to beat out other fisherman before the TAC is reached in a time frame. Fisherman are still governed by many other regulations such a daily catch limits and size limits as well as racing to catch as much as they can before the TAC is reached. Both Hall-Arber et al (2004) and Langdon-Pollock (2004) state

that the down side described by many stakeholders in a CFC is the “race” or “derby” mentality that occurs under this methods, that may force some LCF to take risks at sea (fishing in poorer than acceptable weather conditions or with faulty equipment) that lead to more accidents and deaths.

Both groups of researchers cite the problems found in either method as many. First, in either the Pacific Northwest case or the New England case, those members of each subculture are at odds with each other. A situation of animosity to absolute hostility has developed between ICF and OCF subcultures that are not unlike others of historical precedence. American history shows a time frame when small farmers or ranchers felt they were being pressured out by larger “land grabbers” when changes to open range laws took affect ion the late 1800’s and early 1900’s in the US Plains States. While actual *gun battles* are recorded that occurred because of this, the detrimental effects on the communities still are present. Some issues of highest concern between both parties are:

- Supply – demand price advantage to ICF
- Historical numerical tonnage advantage to OCF
- Higher overhead costs to OCF versus lower ICF
- Seasonal ICF business model heritage versus annual OCF business model heritage
- Who brings more economic advantages to a CFP and a CFC?

Although there have always been perceptions of each sub-culture, by each sub-culture, as to who is a *real fisherman*, these view points had not reached the level they are today. Asforth & Kreiner (1999) suggest that members of both sub-cultures will seek a “social definition and social validation” (p. 417) both within and outside of the CFC. The hardships (isolation, weather, physical danger) of the commercial fishing occupation require a bonding of members at various levels. This is not uncommon in other occupations such as soldier, police officer, or fire fighter where hardships are regularly faced and bonding occurs. Also, common within each one of these occupational cultures are levels of prestige. While the status of one sub-culture as compared to another may only be visible to members of the occupational culture, (EG a non-firefighter will likely see all firefighters the same, where as firefighters may see ladder crews more prestigious than hose crews) the perceptions are palpable none the less. Asforth & Kreiner (1999) cite research by Treiman (1977) and Dunkerly (1975) showing how surveys and statistics can quantify these internal perceptions. The situation in many (possibly most) CFCs is that government efforts to management a common pool resource (seafood) has caused these tacit perceptions, to become explicit divisions; as each group feels threatened by government regulations, and sees the other as having an unfair advantage or an undeserving share of an allocation, no matter what method is used to allocate the resource.

Government Regulations as a Major Driver of Change

A common joke that has been likely repeated thousands of times, in various scenarios, underscores the feelings of most CFCs. “We are here from the government and are going to help you.” The mental image of an incredulous look by the party or parties that are on the receiving end of that communication is what most US citizens visualize. In the case of the CFC the government has become a stakeholder in the CFC.

Pressures brought to bear on government officials and politicians by dozens of well funded special interest groups, have forced them to take action in order to attempt to management a seemingly dwindling common pool resource. Paolisso (2002) describes the relationship between LCF and government regulatory officials (GRO) as one of competing belief systems. This research centers on the Chesapeake Bay Blue Crab fisheries and attempts to manage it by Government Regulatory Organizations (GROs).

Using a cognitive anthropology approach, the author explains that LCF of Chesapeake Bay have a heritage of hundreds of years which has at it roots a general ethno-religious belief system. (Further research that will be cited later

shows that this is a common trait of most LCF in most CFCs.) This is to say that LCF believe in some form of supreme being or force that is beyond a human's comprehension and control. Analogous to this would be that humans can report the weather and may even be able to predict with some accuracy the weather, but humans cannot control or manage the weather.

The Chesapeake Bay and the fisheries within this watershed are to Chesapeake Bay "Watermen" (LCF) the same as the weather. They do not believe that humans in the form of marine scientists, naturalists, fisheries managers and certainly not politicians can have any effect on the rise or decline of a fish stock, in this case the Blue Crab. Paolisso (2002) cites research by Berkes (1999) that describes this phenomenon in several US CFCs and refers to it as "traditional ecological knowledge." This is tacit and explicit knowledge possessed by LCF that does not uncover why something happens just that it does or doesn't happen. The fact that it happens is based on "natural laws" beyond a human's scope. This can be best illustrated in this fashion. A Chesapeake Bay Waterman might say if a human asks this question, "Why do blue crabs go in the mud in the winter to hibernate?" They reason that they could just as easily go to deeper water or out to sea where the water was warmer and food abundant for them. Yet, they choose to stay in the shallows and "go to mud and sleep away the winter." (p. 228) It is a *natural law* that this happens and the reason why is not important. They just know where to find them when the water temperature starts to drop, which is all that is important and provable to them.

GROs on the other hand will have competing theories on this phenomenon and the impact on the fisheries, none of which seem important to the LCF and often are in conflict with one and other. This is not to say that LCF in this or any case cannot see a "cause and effect" scenarios. Typically, they are the first to note changes in an eco-system and fish stock as well as any external drivers that may be occurring. For example, if pollution from *rain water run off* or silting of Blue Crab winter "mudding beds" caused by shoreline construction happening over time; and a decline in the number or quality of their catch at the same time, it would lead any reasonable person to identify a major cause to (in this case) the Blue Crab stocks decline as pollution and encroachment. So when they are told in open town hall type fisheries management meetings, by GROs that the solution to the decline in the Blue Crab population is to decrease the numbers caught it is met with resistance. First, their observations on a daily basis provide different conclusions. Second, for many who are fifth, sixth or even seventh generation Chesapeake Bay LCF, they have seen or have been taught about by elders, that regular fluctuation in catch levels are a *natural ebb and flow* of the fisheries as it has been for centuries. Research shows that this scenario is repeated through out the US, so resistance and hostility towards GROs is a common under current in many CFCs.

"Waterman voiced a very strong belief that quantitative monitoring, statistical assessment, and predictive modeling based on past numbers cannot explain the behavior of the blue crab. Nor can books or articles about blue crabs. Time and again watermen and said scientists (GROs) are smart people and know a lot, but you cannot know the blue crab unless you work the water and try to catch crab year in and year out. It is only through experiential knowledge that one can learn what can be learned about the blue crab." (p. 233)

Many of the US LCF and US CFC have specific ethnic backgrounds. Scottish and Norwegian heritage is a strong influence in many of the US CFPs and is the foundation for various local CFCs today. This is as discussed earlier a factor in occupational prestige identity and social bonding within the CFC. Therefore, research by Gezelius (2002) on the effect of government regulations on Norwegian CFCs in Norway, and Wagner & Davis (2004) of the effects of government regulations on Scottish Gaels CFCs in Nova Scotia, Canada, while not located in the US gives some important perspective to the issues and possible resolutions facing US CFCs.

As Paolisso (2002) observed in his research belief systems with long standing (multiple generations) norms, morals, and values are most often at odds with efforts of GROs. So the efforts to obtain compliance by LCF in a CFC by GROs must take into account their belief system. Law enforcement efforts while required are impractical in most cases involving CFCs because of the expansive nature of the geographic boundaries. Paolisso (2002), Gezelius (2002) and Wagner & Davis (2004) cite various data that would indicate the likelihood that law enforcement authorities with its current manning and resourcing are only able to police a small fraction of any fishery. So to be effective, *willing* compliance by stakeholders of a CFC in general and LCF in particular is key.

Gezelius (2002) discusses in his research “the dynamics of compliance of a group of Norwegian fishermen...and the moral system where infractions could take place without formal sanctions.” (p. 305) The author describes the how action is predicated on “moral considerations” of a specific CFC and what are the applicable norms that can be used to regulate behavior of LCF in a specific CFC. An important discovery by Gezelius (2002) that is identical to previous discussions on LCF occupational prestige identity is that a “fishermen’s identity is strongly linked to the adequate membership of his collectivity.” (p. 307) This is to say that it is very important for members of a CFC who are LCF to have a link to other LCF. This is how they identify who they are, and their role in society both on a micro, and macro scale. As with US CFCs there is little “distinction between work and leisure, colleagues and neighbors or kin.” (p. 307) Because of this fear of being ousted by the community is a strong motivator whether for compliance or not.

According to the author, the Norwegian GROs use a system of fisheries management similar to US GROs. Fish landed and attempted to be sold that are beyond an IFQ or a seasonal TAC can be confiscated by GROs and or the value of this illegal catch in form of administrative fines can be levied. The concept is to remove the economic incentives without placing a “criminal stigma” on the LCF. Interviews by Gezelius (2002) on Norwegian CFCs showed that three basic moral patterns existed.

1. The CFC had an “informally enforced moral” sense to obey the laws.
2. The CFC had an informal sense of loyalty to others in the CFC that required they all follow the same rules whether they were external as set by GROs in form of IFQs or TACs or internal such as no one would catch, buy or sell fish on Sundays.
3. LCF have a moral right to secure for himself and his family an income to stay in the business and make a reasonable living at it.

It is the third pattern that opens what is referred to as a “moral grey zone.” This *moral grey zone* was applicable most often to variances to the first pattern and seldom to the second. This could be that the second was a pattern created by the stakeholders in the CFC and had historical precedence dating back hundreds of years. The first being a relatively new *outside* requirement whose reasoning was not as well accepted or understood although was the law. Examples of informal acceptance of violations of the first pattern would be for a LCF who may have fallen into an economic bind where funds may be required for a family member’s healthcare that exceeds what the states social health system will nominally provide. To take part in the catching, buying or selling of a seafood product that exceeds a IFQ or TAC would be acceptable to the CFC. But if purpose of the digression was to purchase a new automobile and the one the stakeholder had was considered adequate then it would likely be deemed unacceptable. In the first instance the CFC would support the action and the second the transgressor faces possible sanctions by the CFC.

Wagner & Davis (2004) discuss a belief system that LCF in the Canadian Maritimes have that is described as being based on the notion of “property rights” (p. 320) to specific areas, and as such the LCF with these so called *rights* are stewards of the resource, (in this case North Atlantic Lobster) who manage and maintain its ecological health. These

property rights are a cultural characteristic of LCF who pursue North Atlantic Lobster although the moral basis can be traced back ethnically to fishermen of Scottish Gaels lineage. These property rights are referred to as “berths” and are adjacent to common use fishing grounds. It is believed by the CFC that first sense the long term livelihood of a LCF is tied to the long term productivity of a specific ocean area that they are expected to care for and protect it. (Stewardship) This is not unlike the historical guardians of the Scottish Highlands that dates back hundreds of years. The “Gillies” as they are called have the same role over expanses of land and are considered stewards of its natural resources though they don’t own the property. The fact that many “berths” are next to common ground has a net effect that common ground areas were maintained as well because the overflow from adjacent berths proliferated into the common fishing ground as well.

The berths are actually legally transferable commodities. A person may sell or pass on to a child his berth. Normally this includes a boat and equipment (lobster traps) as well as all government licensing required. The value today of this commodity is directly related to the productivity of the berth. \$300,000 to \$500,000 is the average price so there is a strong economic incentive to be a good steward to a berth. The demise of fisheries stock on a berth by virtue of over fishing is inconsistent with this form of stewardship. Common ground areas by virtue of their commonality are more prone to over fishing. But because a specific area will only hold a certain size bio mass before it spreads to other areas even common fishing grounds benefit from this system.

The authors explain that while there is no indication of a decline in the fishery GROs have set about creating laws based on TAC formulas that are not based on the observations and daily interaction of LCF who have berths. The obvious question by the CFCs in the region is “Why?” To have an outside group dictate regulations contradicts the CFCs moral belief system of who will be the better steward. The CFCs have values and beliefs based on an understanding of nature and vested interest in its outcomes. They see the role of GROs to be one that would deal negative external drivers such as shoreline development, pollution and even climate change which is believed by the CFC to be the threats to the fisheries. Not the CFC that depends on a vibrant natural resource they have been able to manage effectively by all statistical accounts by any entity.

This is similar to observations made by Paolisso (2002) of the interaction between GROs and LCF in the Chesapeake Bay region. Both authors point out that family trees of can be traced to each other. So it is easily understood how “stewardship” and a strong sense of understanding natural interactions in a given water column or watershed are closely aligned. Their moral sense is based on vested interest and first hand experience that looks beyond what is good for me today but what is good for my family and community for generations to come. Yet, sense it is not as scientifically based, it is considered less valid regardless of the quantifiable outcomes.

Smith et al (2003) describe the affects of government regulations on CFCs and CFPs when mandated by public referendum. This author’s research concurs with Paolisso (2002), Gezelius (2002), and Wagner & Davis (2004) from the previous discussions, that a major problem between GROs and CFCs is based on trust. Some GROs will state unequivocally that LCF are many cause for declines in fish stocks and portray their role as ones who must right years of wrong. Attitudes of about the role that LCF should play in the process often are based on distrust that the LCF will not do what is in the best interest of the fisheries. Attitudes of LCF about the role of GROs should have are based on distrust that is GROs are not as knowledgeable as they need to be to make such decisions.

While these statements alone would put both parties at odds, a common misconception is that all scientists and managers are in agreement on what are the causes and what should be done. This may be a underlying cause for mistrust in GROs by members of CFCs because they (the members of the GROs) aren’t in agreement or even close to a consensus on most matters put forth for discussion and action. “Many scientists disagreed, noting that there were few problems with over

fishing and little evidence that nets caused any downward trends.” (p. 40) Instead, special interest groups (EG environmental, sport fishing, animal rights) took the lead as to what regulations are developed with little regard for the livelihoods of LCF and data provided by GROs. “...virtually no scientifically collected information about how the net ban would impact fishing families was put forth for public debate.”

LCF see this and then question, “Why are you moving to limit my ability to earn a living and change my way of life when you have no facts to support your claims?” This was never more evident in the case where highly funded; special interest groups were unable to get fisheries managers in the state of Florida to create regulations governing the use of nets to catch seafood. Smith et al (2003) provides evidence that the data available then and now suggest that the use of nets was only a small cause for declines in particular fish stocks. Because GROs didn’t take the action that various Political Action Groups (PAG) desired, a collaboration was formed and a voter referendum was able to be put on a ballot that eventually lead to a state constitutional amendment that effectively ended the commercial use of nets for fishing.

“The vote on the so-called *net ban* was a culmination of a 2-year, multi-million dollar media campaign against Florida’s commercial fishermen. Dissatisfied with the perceived inaction by state agencies and Florida Legislatures, these groups by-passed the normal state policy and regulatory processes and called for a public referendum that would put the issue directly before the voters.” (pp.39 – 40)

What should be regulations concerning managing fisheries for growth became laws that would dictate the control of the states marine resources; CFCs or PAGs? This was a “shot heard round the country.” GROs realized if they didn’t placate PAGs they could be circumvented in most states. LCF realized the days of small local organizations of fishermen much like small farms were organized around *granges* had to end for their expected survival. In Florida most of the fishing was small-scale ICF which meant fishermen were probably at a lower economic strata than counterparts in other parts of the country. Although ICF in these areas still have less economic clout than larger OCF, survivability has forced them to organize in large numbers to survive.

This also exasperated relationships between ICF and OCF as discussed earlier. Survival mentality took hold and if one subculture felt that they could offer up all or a portion of another subculture in an effort to placate PAGs or GROs they would do so. Trust between all parties has been lost in recent years, which created fertile soil of animosity among everyone. We can see that from the efforts to manage fisheries through the use of the external driver of government regulations, the intended resulting changes being an increase in sustainable fisheries and a change on how commercial fishing was conducted, another change has happened as well. The inter-relational dynamics of various sub-groups and sub-cultures in a CFC, that had developed as inter-supporting elements of a larger entity over hundreds of years was changed by this driver as well.

What Will the Future NECFC Look Like and Feel Like?

In the previous research the data has shown that CFCs in general and the NECFC in particular are undergoing a substantial change in their character. The days of CFCs as passively observed and written about by numerous authors in both biographical pieces and historically factual works of fiction are demonstrably changing. It is questionable whether this *progress* is headed in a positive nature or not. Some CFCs have embraced (willingly and unwillingly) the winds of change they face and have outcomes that are significant to their survival.

Endter-Wada & Keenan (2005) describe how the fundamental unit of a CFC (the family) in a specific CFC location has dealt with the situations discussed. The authors conducted a three phase study of a portion of the Southern Pacific CFCs of California that included six major CFPs in three counties.

The first phase of the study was conducted from 1992 – 1993. It included protocol development at a test site that was not part of study and visits to study ports to conduct key informant interviews and secondary data analysis. The second phase was an ethnographic study of members of the study CFCs that included observation and questionnaire pre-testing. The third phase, conducted in 1996 was the administration of the survey of LCF and their spouses and an analysis of the data gained from the survey. The completion rate of the questionnaires was 51% of all LCF and 47% of their spouses with approximately 10% of the total number of LCF refusing to take the survey.

A detailed comparative quantitative statistical analysis was done of the data derived by the survey conducted in phase three of the study. Ten tables were created to organize and collate the primary data gathered. There were as follows:

1. Major Changes and Reasons for Making Changes in Fishing Operations
2. Changes in Home Port
3. Characterization of Historical Fishing Effort
4. Types of Fishing Gear Used
5. Fisherman Spouses Who Work Outside the Home
6. Household Characteristics that Differ from other Households Due to being part of a CFC
7. Satisfaction with Cooperation Among LCF within the CFC
8. Satisfaction with Cooperation Among LCF within the GROs
9. Why the started fishing? When they started fishing?
10. What they like most about fishing? What they like least about fishing?

As in previous discussions, the authors noted from their findings that the LCF who work in an inshore capacity are very adaptive. The research indicated that adaptations were likely developed due requirements of changing fisheries pursued due to Natural Science or Economic drivers. This concurs with research by Smith et al (2003) of Florida inshore LCF and Paolisso (2002) Chesapeake Bay LCF.

Endter-Wada & Keenan (2005) noted that while long time LCF make adaptive decisions based on economics (which is verified cited research of Durrenberger [1997] and Groth [2001]); it is unlike a corporate economics based decision making model such as *Supply versus Demand*, the LCF and their families make adaptations based on a perceived need to stay active in the CFC. This conclusion is also in agreement with previous research done by Smith et al (2003) [Florida] and Paolisso (2002) [Chesapeake Bay] as well as Hall-Arber et al (2004) [New England]. The adaptations of LCF and their families are not based solely on greater economic gain. Examples such as moving to a different CFP, a spouse (normally the wife) working outside the home or the LCF working at a second job not related to the CFC so as to have enough income to survive and stay actively fishing is the norm for most inshore LCF.

On the other hand, LCF who work or own much larger offshore operations were more likely to make corporate like decisions based more directly on economic advantage. These decisions included leaving the CFC through selling out to other LCF or government financed buy-outs of their operations. These larger offshore operations as previously noted were more uni-fisheries focused (following a species as it migrated) versus the inshore multi-fisheries focused (changing gear, methods and target species as they seasonally migrated through a given area). Thus, it may be logically reasoned that the larger operations perceived they had less options because of their lack of inherent abilities to adapt.

What is notable here is that Hall-Arber et al (2004) found in their research that GROs and various government resourcing was also more likely available for these larger corporate ventures who may have considerable more capital tied up in their operations individually; than for smaller LCF. Even though as a group the smaller family operations when taken as a group had equal amounts of investment and often times considerably more likelihood of substantial return on their

investments and were less likely to fail. Data from the US Department of Commerce shows that only restaurants have a higher rate of failure than commercial fishing operations when comparable amounts of capital are invested.

The data researched indicates that the paradox and plight of the CFC is:

1. ICF, which are small scale, multi-fisheries, family operations are more likely to have inherent abilities to adapt but only so as to stay active in a CFC.
2. OCF, which are larger scale, uni-fisheries, corporate operations are less likely to have inherent abilities to adapt and will often leave a CFC for economic reasons alone.
3. Resources are more prevalent and regulations are more positive for OCF than ICF.

Since the research indicates that CFC members who are ICF are more likely to face harsh results of a socio-cultural evolutionary phenomenon than OCF members, an important question is, “is it possible to reshape the community without destroying it?” A subsequent question derived from this paper’s research is “why is it that the ICF subculture of the CFC, who is more inherently adaptive, is less likely to embrace socio-cultural change to their lives?” All the previously cited research indicates that while they can and do adapt, (often times making extreme sacrifices in the process) it is only done so as to able to stay actively fishing.

What if a GRO determines that the population of the ICF subculture must be reduced for fisheries management reasons? Research cited has indicated that these reasons could be motivated ecologically, economically, or politically (or a combination of all three is most likely); yet the outcome is consistently the same; the ICF subculture is the one most likely to have to make the most substantial changes. Logic would indicate they should be able to change more easily. Why is that not historically the case? What has been done to lessen the blow to the ICF subculture? What innovations might be tried to help this part of the CFC through these forced changes brought on by drivers outside of their control or impact?

Minnegal et al (2003) describes how ICF subculture in a specific Australian CFC has handled the changes discussed that are affecting the ICF subculture of the US CFCs. The authors’ research indicates that drivers of change and the characteristics of the CFC are striking similar by all accounts. So a parallel may be drawn as to results and actions that may be taken. The nucleus of the problem according to Minnegal et al (2003) and Endter-Wada & Keenan (2005) is their identity (both individually and as a whole) based on lengthy historical tradition. “The paradox arises because fishers, like others who seek to sustain a future in the face of threat from outsiders, must reshape strongly felt self identities.” (p. 1035)

Ashforth & Kreiner (1999) describes how a person who may be part of an occupation that is “dirty or dangerous” (two major characteristics of commercial fishing) will derive their self identity from that occupation. This identifying causes what the author describes as a “dysfunction of dirty work cultures” “...a major function of dirty work cultures is to externalize threat and preserve the collective esteem...” (p. 429). This reference to *externalized threat* by Ashforth & Kreiner (1999) would be the *threat from outsiders* cited by Minnegal et al (2003). So change that is caused by an outside force (one that is not part of the culture such as natural science or economics) is looked upon adversely rather than positively (“less fish mean a higher prices”) or neutrally (“what can you do about the weather?”). Thus GROs and their subsequent activities and actions are likely to be placed in the category of *outside* or *external*.

All of the research indicates that commercial fishing is not a typical occupation, but a lifestyle with deeply rooted traditions of family and community. In the past a threat to one is often seen as a threat to all. But Minnegal et al (2003) describes how GROs (“imposed management regimes” [p. 1035]) have been able to divide the previously unified subcultures of a CFC through regulation that now has one sub culture (the ICF) pitted against the other (OCF). So threats that were once only external now are internal as well.

In addition to this, the authors cite a battle in Australia for a common resource (fish stocks) that is parallel to the battle fought in all areas of the US. Sport fishing groups and other activists in publicity campaigns vilify all members of the CFC as “rapers and pillagers”. Smith et al (2003) describe these same public relations activities as part of the Florida net ban referendum carried out by sport fishing groups and other like minded activists. Both Smith et al (2003) and Minnegal et al (2003) detail the quantitative ill affects on persons within the CFCs. Huge increases in family violence, drug and alcohol abuse and suicide were statistically found which would indicate a causal relationship between the conflict occurring and the after shocks of the resulting force change in the community.

Both Paolisso (2002) and Minnegal et al (2003) cite in their research that LCF both in Chesapeake Bay, MD and Victoria, Australia have an extremely close mental connection with the sea, that is perceived to be inherited or “in the blood” (interestingly both authors use this term). Thus outsiders are perceived to be unable to fully understand the situation concerning fisheries management as clearly as they can. Paolisso (2003), Smith et al (2003) and Minnegal et al (2003) have a determined a perception by ICF that is a common thread; that the regulations imposed are mostly for “...manufactured political ends...” (p.1049) and less for sound fisheries management. That Government Regulatory Organizations (GROs) who are unable or unwilling to take on larger concerns such as pollution, climate change, or corporate influence find smaller ICF as prime targets that will net public relations points for influential constituents.

So it can be concluded that change as it is happening today in the CFC is destroying it. From the ill effects felt in response to the imposed changes, to the changing of a once unified family focused community to one of divided subcultures based on self interest and preservation change is rapidly occurring. It is unlikely that any accurate prediction can be made to what the CFC anywhere will look or feel like in the near or distant future. It is likely then, that in the near future the total population of LCF will certainly shrink. While in the past this has been a natural occurrence that coincided with the ebb and flow of fishery stock levels; now it is a manmade event that is supposed to be of a permanent nature [Paolisso (2003), Smith et al (2003)]. Less LCF means certainly an easier task of managing LCF for the GRO because their voices will be less vocal. Along with this loss will be the loss to thousands of LCF of their traditions and heritage accumulated over hundreds of years which may not have a quantifiable value when compared with the loss of fisheries stocks. It is however certainly qualifiable when compared to native inhabitants who have been given special dispensations in regards to fisheries management regulations because of their hundreds of years of tradition and heritage. [Paolisso (2003), Smith et al (2003) and Minnegal et al (2003)]. This situation has only fueled the fan of animosity, anger and mistrust towards anyone who is an *outsider*.

The question remains, is there still a way to bring about positive progress to a CFC? Paolisso (2003), Smith et al (2003), Wagner & Davis (2004), Gezelius (2002), Hall-Arber et al (2004), and Minnegal et al (2003) in particular agree of a practice by GRO in developing and administering regulations in regards to LCF participation. Input by LCF takes place most often in the flowing methodology.

1. GRO determine a course of action based on recommendations made by fisheries scientists.
2. LCF are given an opportunity to voice their opinion about the course after the plan has been proposed.
3. Go forward with the plan as proposed regardless of LCF input.

This series of events has created more division and less willingness to comply fully. When LCF are not allowed to be part of process from the beginning, this is to say the research, analysis and recommendation steps done by fisheries scientists, ill feelings are obviously created. All the research indicates that LCF are left with either of two perceptions:

1. They think fisherman are like children who are unable to understand the science and need to be told what to do for their own good [Smith et al (2003), Minnegal et al (2003)]

2. Why bother with this whole charade? You (the GROs) have made up your mind and you are just letting us vent because you have to as required by law. [Paolisso (2003), Hall-Arber et al (2004)]

This method administration by GROs may occur for two reasons as well:

1. A belief by GROs and special interest groups that LCF have been the abusers and left to their own devices will not accept the changes that needed in accordance with sound scientific data.
2. The sheer difficulty of getting a consensus among all user groups and GRO officials that would be agreeable to all, so do what is most agreeable to the most publicly vocal.

Ziegenhorn (2000) discusses this situation at great length. After interviewing dozens of key informants both in the CFC that is focus of the study and among the outsiders (GROs, special interest groups and scientists), he found that even when scientists find that the stocks of fisheries under management is the "...best it has ever been because of efforts to reduce pollution" and able to sustain a vibrant commercial fishing community; that GROs, scientists and special interest groups "...express misgivings about the future of commercial fishing." (p. 165) Why would be this be the case?

According to Ziegenhorn (2000) the hostility faced by LCF is a mirror of what has been found by Paolisso (2003), Smith et al (2003) and Minnegal et al (2003).

"Recreational fisherman complain that the commercial fisherman ruin certain areas for the weekend fisherman. As a group, recreational fishermen spend more money on gear and licenses and have more political influence than commercial fishermen. In addition to attacks from recreational fishermen, commercial fishermen often face hostility from biologist-the stereotype of the dishonest uneducated, violent, ecologically insensitive "river rat" (slang name for local fishermen who work on the Mississippi River which is much like the name water man or bay man as previously discussed) has led some Department of Natural Resources (GRO) officials to conclude that commercial fishermen would be best regulated out of existence." (p. 165)

Another researcher who has studied fishery management in the Barents Sea has found that when including the LCF in the process from the outset he is made to feel that he is a major stakeholder and not a pawn. Honneland (1999) discovered that by using basic management theory of stakeholder inclusion rather than exclusion there is higher degree of willing compliance. He lays out three part reaction to managing fisheries from a user group perspective that includes the LCF.

1. A high level of user-group participation and inclusion in the management of fisheries has lead to-
2. A management system that is largely perceived as legitimate by LCF-
3. Who then have a higher degree of compliance with the regulations that are developed and implemented? (p. 402)

As with all the previously cited authors work, the perception by the LCF in Honneland's (1999) study is that self regulation based on naturally occurring events; that cannot be fully understood by humans has worked in the past and will work in the future. What is most revealing is Honneland (1999) research that cites studies by several other authors [Baland & Platteau (1996), Berkes (1989), Bromley et al (1992), Ostrom (1990)] which find that, "...a vast number of successful management systems for common pool resources, include in their management systems local, traditional, beliefs of unintended and spontaneous (natural) events as embraced by the harvester." (p. 397) While not solving the problem of the quantifiable loss to the CFC, certainly this basic level management concept of *including all people who are stakeholders of the resource, in the process from the beginning to give a vested interest in the ultimate outcome*, would benefit the quality of changes as perceived by a major stakeholder, the LCF.

The body of knowledge in the area of fisheries management is sufficiently large and quantifiable to statistically analyze and create decision making models that are likely to have some effect on a fishery stock and quite possibly a complete ecosystem. Additionally, the depth and breadth of research on CFCs and the phenomenon of socio-culture change is both current and large as well. The overall situation may be better dealt with and the resulting outcomes better suited for success when both bodies of knowledge are utilized in a cohesive effort. There is little doubt from the data available that a reduction in the number of LCF (in the US overall and New England in particular) due to regulation *and not natural events* is virtually certain. Also, the ability of those who are able to remain engaged in commercial fishing and be both economically profitable and do so in a social acceptable manner as has been part of their heritage and identity will still be at risk if management methodology employed remains at status quo.

It is evident that substantial actions have and are being taken to address how and what must be done to help the quality of the *fisheries stocks* in the form of management efforts. However, the evidence demonstrates that in most cases little is done to address what can be done to help *fishermen* who will have to make the most drastic change of all; leaving their heritage as commercial fisherman and identities as members of *their* community.

It can be and has been argued that what is happening is a classic case of “Social Darwinism.” According to the research many of the parties mentioned such as fisheries managers and biologists are of the opinion that LCF should go the way of the “free range cowboy” and pass on as a relic of some historical significance. GROs and city planners interviewed by the various authors have indicated that they see CFCs as a piece of Americana that should only be preserved if it has value beyond itself, such as an attraction for tourism. So it may be as Holfstader (1955) states in his work “Social Darwinism in American Thought” that numerous social philosophers and scientist would look at the socio-cultural change in the CFC as truth in action.

Referring to the Social Darwinist William Graham Sumner, Holfstader declares that, “Sumner’s synthesis brought together three great traditions of western capitalist culture: the Protestant ethic, the doctrines of classical economies, and Darwinian natural selection.” (p. 51) Holfstader also discusses Herbert Spencer’s ideas and sums them up in one quotation, “You can’t make the world all planned and soft. The strongest and best survive-that’s the law of nature after all – always has been and always will be.” (p. 50) Though dated, Holstader concludes that Social Darwinism had largely disappeared after WWI and it is part of American folklore. The data found in this research demonstrates very explicitly that his conclusion is far from true if one objectively observes the actual events in the Commercial Fishing Community, the Commercial Fishing Ports and the lives of Licensed Commercial Fishermen.

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