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A New Commons: Considering Community-Based Co-Management for Sustainable Fisheries

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**A NEW COMMONS:
CONSIDERING COMMUNITY-BASED CO-MANAGEMENT FOR
SUSTAINABLE FISHERIES**

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In partial fulfillment of a Bachelor of Arts Degree in Environmental Analysis,
2012-13 academic year, Pomona College, Claremont, California

Readers:
Dr. Nina Karnovsky
Dr. Heather Williams

Many thanks to my readers, Nina Karnovsky and Heather Williams, for their advice, support and confidence throughout my project. It was an honor to work with both of you.

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A note on confidentiality—Interviewees whose names appear in the text gave me permission to quote them and use their names. Quoted material from interviewees who did not give me explicit permission to use their names is identified only by their title or role. Information that I was told outside of formal interviews and information that is sensitive and identifiable by title is footnoted as a personal communication.

A note on “fisher” versus “fisherman”—I have used both terms in my text interchangeably. Many people accept “fisherman” as a gender-neutral term, although I had some difficulty with this. Some also object to the term “fisher.” I tried to stay true to what identifiers the interviewees used.

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List of Acronyms

NMFS—National Marine Fisheries Service
NOAA—National Oceanic and Atmospheric Association
ODFW—Oregon Department of Fish and Wildlife
POORT—Port Orford Ocean Resource Team
RCA—Rockfish Conservation Area
PFMC—Pacific Fishery Management Council
NPFMC—North Pacific Fishery Management Council
FMP—Fishery Management Plan
IFQ—Individual Fishing Quota
ITQ—Individual Transferable Quota
QS—Quota Share
IQ—Individual Quota
TAC—Total Allowable Catch
CFA—Community Fishing Association
MSA—Magnuson Stevens Act
POSS—Port Orford Sustainable Seafood
CSF—Community Supported Fishery
ADF&G—Alaska Department of Fish and Game
ALFA—Alaska Longline Fishermen’s Association
RAM—Restricted Access Management
CDQ—Community Development Quota
CQE—Community Quota Entity
BSAI—Bering Sea and Aleutian Islands
GOA—Gulf of Alaska
FCN—Fishery Conservation Network
CFN—Community Fisheries Network
LAMP—Local Area Management Plan
VMS—Vessel Monitoring System
AO—Alaskan’s Own
EEZ—Exclusive Economic Zone

Introduction

I have stood on the docks in fishing harbors up and down the coast, smelling the salty air sharpened by the fishiness of nets and pots recently emptied of their catch. Rusting, barnacle-caked fishing boats fill the slips in these working harbors, distinct from the yachts tied at adjacent docks, and much smaller than trawlers or other industrial vessels. These boats possess significance beyond the functionality visible in their battered hulls and stained decks—they represent small businesses and jobs, they represent hundreds of years of collective knowledge of complex ecosystems, they represent access to fresh, local food, and they represent the fabric of a rich maritime culture. The fishermen who participate in these small-boat fisheries linked to coastal communities repeat that their work and all that it represents is threatened by changes in the fishing industry. Individuals in each fishing community have a different story to tell about specific challenges, but they share a feeling that they are resisting undefined and inevitable forces slowly seeking to erase their way of life, or at least render it unrecognizable. Lack of access to expensive fishing quota, low numbers of young entrants into the industry, highly restrictive catch totals, rising operating costs and competition from import and industrial fisheries challenge the existence of small-scale community fisheries. Despite the odds, or maybe because of them, individuals and fishing communities are pursuing new and creative ways to achieve economic, social and ecological sustainability within their fisheries. Witnessing these new developments and solutions in the fishing industries in towns and cities from Alaska to California gives me hope for these specific places, as well as hope for the paradigm shift that they represent, a shift towards a model of localized, sustainable natural resource management.

Chapter 1: Background

Fish are not the center of our understanding of fisheries. There is a wide web of intricate relationships between marine ecosystems and what we take from them, the people who catch fish, the social and economic fabric of communities and markets, and the governmental institutions that regulate the fisheries. To maintain sustainable fisheries we must also maintain sustainable ecosystems, sustainable communities and sustainable economic activity. –Ray Hilborn, 2012¹

I began researching this thesis during the summer of 2012. After witnessing the effects of highly unsustainable fishing practices while abroad in Senegal, I wanted to learn what a “sustainable” fishery was. I headed home to Seattle for the summer to learn about the management of fisheries off the West Coast. Growing up in Seattle, I have always been aware of the fishing industry—hearing stories of relatives working in fishing, buying fresh fish at markets, and seeing the occasional fishing boat. Bringing my Environmental Analysis training to my research, I was looking for problems and alternatives to the status quo.

I arrived on the doorstep of the regional offices of the National Marine Fisheries Service (NMFS) knowing next to nothing about fisheries science and management. My initial questions were, in retrospect, uninformed and extremely general. At first, I was essentially asking, “How do we define and manage sustainable fisheries off the West Coast?” Through interviewing scientists and managers, I began to learn more about the immense biological and mathematical complexities of stock assessments. Management decisions and policy are based on the outcome of these assessments and the decision of various levels of governance. It became very clear to me that I was ill equipped to make any sort of assessment or critique of the stock assessments—that was the job of experts,

¹Ray Hilborn, *Overfishing: What Everyone Needs to Know: What Everyone Needs to Know*. (Oxford University Press, New York, 2012), preface.

not undergraduates. Furthermore, for fisheries on the West Coast, the current story is that as far as we know, we are practicing the best available science and management. These stories may change with greater knowledge and different goals, but for now, it is generally believed that we are successfully managing the biological sustainability of our ocean fisheries. As I delved further into policy, I learned how recent readjustments in management and permitting have begun to address some of the economic inefficiencies in the fishing industry. Many fisheries on the West Coast are large-scale commercial endeavors, and most are economically viable. Alaska fishing demonstrates these qualities, possessing by far the highest volume fisheries in America, though much of the Alaska industrial fleet is headquartered in Seattle. New programs such as catch shares and other limited entry were introduced to address economic inefficiencies like overcapitalized fleets and competition.

As I learned more about “sustainability” in the context of fisheries, I began to realize that the most unanswered questions lie in the third circle of sustainability—the realm of the social. To explore the social sustainability of fisheries on the West Coast, I visited fishing towns and cities to conduct fieldwork. Social sustainability is tenuous and complicated. Optimizing for ecosystems, the ocean would be best left unharvested. A model featuring one company with the rights to harvest and distribute the fish in a clean, systematic and controlled manner would characterize the most economically efficient industry. Economic efficiency is achieved when fishing pressure matches the level that stocks can sustain, often described by an amount of biomass that must be maintained, or a

measure of maximum mortality allowed for sustainability.² Too many boats competing for few fish, or boats increasing size and fishing technology to outcompete each other are symptomatic of economic inefficiency. Neither optimizing for ecosystems nor pursuing complete economic efficiency is ideal for fishing communities who rely on the jobs and income that the ocean provides. Fisheries management policy has protected fish stocks by setting catch limits and promoted economic efficiency by allocating shares. Within these policy decisions, there are options for communities to take greater responsibility in the management of the resources of which they are the primary users. A conversation with fisheries scientist Ray Hilborn elucidated this dilemma:

...we come late to the game with really identifying what it takes to make the social and economic parts of the fishery really work. And in fact, we know how to make the economic parts work. If you were just interested in making a profit, then ITQ and sector allocation seems to work quite well. But there are certainly a lot of social downsides to that, and what we haven't really figured out as a society is, what's our tradeoff between economic profitability, employment, tying fishing to existing communities and environmental impacts of fishing and production of food.³

However, as it currently stands, local fishers and state and federal managers are frequently at odds, disagreeing over catch limits, allocation and enforcement.

As I became more focused in my research, I began to learn about community-based co-management (also referred to as community co-management or co-management) in the context of smaller-scale fisheries. Under theoretical co-management models, communities work in conjunction with state and federal managers to ensure that fisheries are ecologically, economically and socially sustainable. After extensive preliminary research and learning, I came to a new set of questions: Is a community co-management approach viable and effective for small-scale West Coast fisheries? What are examples of this

² Ray Hilborn et al., "State of the World's Fisheries," *Annual Review of Environment and Resources* 28, no. 1 (2003): 359–399, accessed November, 2012.

³ Ray Hilborn, Personal Interview, July 17, 2012.

management model? What are potential obstacles? In practice, what does community-based co-management look like? In the following research, I will explore emerging examples of community-based co-management on the West Coast while explaining the social and historical context that leads us incorporate new management paradigms while simultaneously creating obstacles.

I. Status of the Stocks

Ted Ames, the Gulf of Maine's iconic lobsterman-scientist states simply, the fish are "there year after year, as long as you take care of it."⁴ In both the scientific and nonscientific communities, the dominant dialogue suggests that fish resources have gone the way of other natural resources and wild populations: mismanaged, overexploited and in decline. To use the words of Ted Ames, it would appear that we have not "taken care of it." In response to a history of alarming declines and collapses, the fields of fisheries science and management have developed to monitor and regulate access to fish resources. Consumer markets for sustainable seafood have expanded in the U.S. as information about the status of stocks and harvest practices reaches the public. Fisheries declines illustrate a narrative of general failure to sustainably manage and regulate common property resources, defined as the resources owned in common and exploited by competitive individuals.⁵

a. A Global Fisheries Crisis?

Are we facing a worldwide decline in wild fish resources? The 2012 United Nation's FAO report, *World Review of Fisheries and Aquaculture*, suggests that there is cause for

⁴ Wilkinson, Alec. "The Lobsterman." *The New Yorker*, July 31, 2006, 56.

⁵ H. Scott Gordon, "The Economic Theory of Common-Property Resource: the Fishery", *Journal of Political Economy*, 62, no. 2, (1954): 124-142, accessed November 21, 2012.

concern about the long-term viability of fish resources as a critical protein source for large numbers of people. The report claims that 57.4 percent of global fish stocks are fully exploited, a figure that has increased steadily since 1989. Of global fisheries, 29.9 percent are overexploited, and only 12.7 percent are underexploited and have the potential to sustain an increase in harvest.⁶

In 2006, Worm et. al published an inflammatory paper in *Science* claiming that fisheries collapses had been accelerating and 29 percent of exploited fish stocks had collapsed by 2003. Extrapolating from this calculation, the authors suggested that 100 percent of global fish stocks would have collapsed by 2048. Researchers identified examples of declining yields despite increases in fishing effort across large marine ecosystems as an indicator of decline.⁷ Preeminent fisheries scientist Daniel Pauly claims that without increased government regulation, the fishing-industrial complex will bring about “the end of fish.”⁸ Pauly has authored numerous other papers expounding upon the reasons why we find ourselves in a fishing crisis. He hypothesized that commercial fishing is currently “fishing down marine food webs.” This hypothesis asserts that landings of high trophic level, large fish have declined and have been replaced by lower trophic level invertebrates and planktivorous fish. These shifts will result in widespread ecosystem collapses as fishing pressure turns to forage fish, which reduces prey available to marine predators and scavengers are fished out, causing eutrophication.⁹

⁶ FAO, *World Review of Fisheries and Aquaculture*, Rome, Italy, 2012, 52-62.

⁷ Boris Worm et al., “Impacts of Biodiversity Loss on Ocean Ecosystem Services,” *Science* 314, no. 58 (November 3, 2006): 787–790, accessed September 29, 2012.

⁸ Daniel Pauly, “Aquacalypse Now,” *The New Republic*, September 28, 2009.

⁹ Daniel Pauly et al. “Fishing down Marine Food Webs,” *Science* 279, no. 5352 (February 6, 1998): 860, accessed September 29, 2012.

Non-scientific literature echoes these perspectives. In *Four Fish*, a journalistic examination of the history of human relationships with cod, sea bass, salmon and tuna, Paul Greenberg writes that management can become easily compromised by commercial demand. Without sound management, “fish populations inevitably enter into a spiral of decline that can lead to genetic collapse and irreparable damage to a hugely important food system”; each of the four species mentioned by Greenberg have experienced spiraling declines due to historical overfishing.¹⁰ The reality of overfishing and the potential ecological and social impacts cannot be understated.

These authors suggest that widespread overfishing and the devastatingly real potential for collapsing fisheries represents an irrefutable scientific truth. Though the media has sensationalized this story to the point where it has become the dominant conversation in fisheries science and management, the science is not in consensus. Fisheries scientist and professor Ray Hilborn calls the body of work and media response predicting global collapse a “litany of disasters” and offers numerous contradictions that disprove predictions such as a complete collapse of fisheries by 2048 and declining trophic levels. Though Hilborn does not dispute that overfishing exists and is a serious problem, he holds that in many areas, fishing pressure has been reduced to allow stocks to recover, and examples of successful management can be found in many regions.¹¹ Ongoing scientific dispute makes it difficult to identify what is the truth about the status of fish stocks on a global scale. Immense variation between species assemblages, fishing infrastructure, regulation and data collection make such sweeping analyses easy to invalidate with diverse

¹⁰ Paul Greenberg, *Four Fish: The Future of the Last Wild Food*, (New York: Penguin, 2011), 186.

¹¹ Ray Hilborn, “Moving to Sustainability by Learning from Successful Fisheries,” *AMBIO: A Journal of the Human Environment*, 36, no. 4, (2007), 296-303, accessed October, 2012.

counter examples. Though also imperfect, assessing the status of localized fisheries in data rich systems offers more conclusive trends and information, though few Fishery Management Plans (FMPs) have implemented this approach.

b. West Coast Fisheries

Fishing has long occupied a place of importance within the populations and economies of the West Coast states from Alaska to California. The Alaska Current shapes Gulf of Alaska fisheries; the cold, nutrient-rich waters are classified as moderately productive but with high biological diversity.¹² The California Current and coastal upwelling create highly productive waters off the coast of Washington, Oregon and California.¹³ Native populations practiced subsistence fishing of marine and anadromous species along the entire coast for thousands of years; the bounty of the sea supported rich indigenous cultures.¹⁴ In 2011, the value of commercial fishing landings in Alaska, Washington, Oregon and California totaled \$2,695,194,940 pounds. The fishing industry provided 24,211 jobs in these states.¹⁵ In addition to their economic value, fisheries are part of complex and diverse ecosystem processes that are impacted by commercial and subsistence fishing practices.

i. A History of Booms and Busts

The history of commercial fishing on the West Coast of the United States began with the salmon industry. The Hudson's Bay company was salting and exporting Fraser River

¹² M.C. Aquarone and S. Adams, "Gulf of Alaska: LME #2," *NOAA Central Library*, n.d. <http://www.lme.noaa.gov>

¹³ M.C. Aquarone and S. Adams, "California Current: LME #3," *NOAA Central Library*, n.d.

¹⁴ Robert T. Lackey, "Historical Ecological Context," *Western Ecology Division / US EPA*, 2000, <http://www.epa.gov/wed/pages/staff/lackey/pubs/illusion.htm#historical>.

¹⁵ "Fisheries of the United States-2011," Page. *NOAA Office of Science and Technology*, n.d. <http://www.st.nmfs.noaa.gov/commercial-fisheries/fus/fus11/index>.

Sockeye Salmon as early as 1800.¹⁶ Towns and populations sprang up along the coast, even in remote regions of Alaska, to supply canned salmon to the rest of the country and the world. Salmon is still a primary target species, though fisheries have diversified to include coastal pelagics, groundfish, halibut and nearshore fisheries like lobster and urchin, and salmon catches in the lower 48 are highly restricted.¹⁷

Many of these species have been subject to cycles of boom and bust due to ecological factors and fishing pressure. Since 1994 when the Department of Commerce began emergency bailouts, disaster relief funds for fisheries failures have been distributed repeatedly for the fishers of key commercial species. Northwest Salmon fishers have been declared eligible for disaster assistance three times. Alaska Salmon runs were declared eligible three times with a recent fourth in 2012 for Chinook salmon, West Coast groundfish fishers (an assemblage of 90 species) were given assistance in 2000, and Bering Sea snow crab fishers were twice. West Coast salmon fishers, a larger geographic amalgamation than the Northwest fishers, received assistance three times, and several other salmon stocks before have declined to the point of being eligible for disaster assistance. Major declines occurred prior to the advent of disaster relief in 1994. California coastal pelagics have demonstrated cycles of exploitation and decline. Sardines were heavily exploited until infamously crashing in 1951, jack mackerel replaced sardines until 1965, followed by heavy exploitation of anchovies until 1977, pacific mackerel through 1990 and sardines again until 2002. Groundfish declined to the point of requiring

¹⁶ Tim D. Smith, *Scaling Fisheries: The Science of Measuring the Effects of Fishing, 1855-1955*, (Cambridge University Press, 1994), 21.

¹⁷ “Pacific Fishery Management Council”, n.d., <http://www.pcouncil.org/>.

extensive area closures that are still in effect.¹⁸ In evaluating commercial fisheries over a longer time series, Mason writes, “The fisheries have historically maintained the value of landings by switching effort from declining species to those not yet fully exploited, but this is no longer possible: we are running out of marketable unexploited species.”¹⁹ Some collapses in stocks are poorly understood and poorly documented such as the collapse of the Walleye Pollock in the internationally fished “donut hole” region of the Aleutian Basin. It is estimated that there were 13 million tons of Pollock in the fishery in 1983, but by 2007, the stock had declined 98 percent.²⁰ These examples illustrate the evolution of the fishing industry and the ever-present uncertainty about appropriate fishing pressure and accurate assessment.

ii. Current Status

Despite stock fluctuations, fisheries remain highly important to the economies of West Coast states. By volume of fish landings in 2010, Alaska, Washington, Oregon and California rank first, eighth, sixth and fourth in the nation respectively. By value of fish landings, Alaska, Washington, Oregon and California rank first, fourth, tenth and eleventh respectively. The most commercially important Alaskan species by value were Walleye Pollock, Sockeye Salmon and Pacific Halibut, each worth over \$200 million. The most commercially important species in Washington were Dungeness Crab (57 million), Geoduck (56.8 million) and Oysters (30.2 million). Oregon’s top landings were Dungeness Crab (32.7 million), Sablefish (15 million) and Albacore Tuna (12.4 million). California’s

¹⁸ Chris Wright. “Commercial Fishery Disaster Determinations.” *Office of Sustainable Fisheries*, n.d. http://www.nmfs.noaa.gov/sfa/sf3/disaster_determinations.htm.

¹⁹ Janet E. Mason, “Historical Patterns For 74 Years of Commercial Landings in California Waters,” *CalCOFI* 45 (2005): 188.

²⁰ Kevin M. Bailey, “An Empty Donut Hole, the Great Collapse of a North American Fishery”, *Ecology and Society*, 16, no. 2, (2011): 28, accessed September, 2012.

top landings were Squid (71.2 million), Dungeness Crab (41.2 million) and Sablefish (11.5 million).²¹

According to the best available science and current management regimes, both efforts to end overfishing and rebuild previously overfished stocks on the West Coast are currently successful. The 2011 Status of the Stocks report prepared by the National Marine Fisheries Service (NMFS) for federally managed fisheries states that within the exclusive economic zone (EEZ), which is 3-200 miles offshore of Washington, Oregon and California, including over 150 stocks and stock assemblages, only six stocks are currently considered overfished: Canary Rockfish, Cowcod, Pacific Ocean Perch, Chinook Salmon (California Central Valley, Fall), Coho Salmon (Washington, Western Strait of Juan de Fuca), and Yelloweye Rockfish. All six of these stocks are currently under rebuilding or have rebuilding programs in development. However, there is always concern that new data or information about the life history of a species reveals that the species is overfished when previously thought to be healthy. Currently, only Pacific Bluefin and Bigeye Tuna are subject to overfishing. The species' status as highly migratory complicates the regulation, which is governed by a complex set of international accords that prove difficult to enforce.²² For federally managed fisheries within the EEZ off the coast of Alaska, of over 60 stocks and stock assemblages, only 2 stocks are overfished: Blue King Crab and Southern Tanner Crab. Both are currently under rebuilding programs. According to NMFS, no stocks in Alaska waters are currently subject to overfishing. Nationwide, 2011 saw an increase in the pounds and value of fish and shellfish landed domestically, representing a 17-year high

²¹ US Department of Commerce, "Commercial Fishing Indicator," *NOAA's State of the Coast*, n.d. http://stateofthecoast.noaa.gov/com_fishing/welcome.html.

²² NMFS, *Status of the Stocks, Report on the Status of U.S. Fisheries for 2011*, Silver Spring, U.S., May 3, 2012, 1-32.

at 10.1 billion pounds valued at \$5.3 billion. However, about 91 percent of the seafood consumed in the U.S. was imported, including fish caught in U.S. waters and shipped overseas for processing.²³

II. Regulatory Structures

The legal governance of U.S. fisheries falls under regulation by NMFS, a subsidiary of the department of commerce. Eight Regional Fishery Management Councils interpret the law to create and implement management plans for regional fisheries under the oversight of NMFS, the Department of Commerce and Congress.²⁴ In a 2008 assessment of Executive Branch authority, Van Tuyn and Brown explain that the conventional view of the relationship between the regulatory bodies is that though NMFS and the councils jointly manage, NMFS generally cannot make management decisions without council input. Upon review, the authors conclude that the Executive Branch does have the general authority to implement management and conservation measures, particularly in the case that “circumstances exist that are anathema to a sustainable interaction between fishing and the marine environment.”²⁵ NMFS and the councils function as distinct entities with overlapping roles in the sphere of fisheries management.

a. The Magnuson-Stevens Fishery Conservation and Management Act

Commercial fisheries in the United States are managed under the legal framework of the Magnuson-Stevens Fishery Conservation and Management Act. The Act was signed into law on April 13, 1976, as a part of the flood of environmental legislation during the 1970’s.

The late Senator Warren G. Magnuson from Washington was a primary architect of the

²³ Christine Patrick and Fiona Matheson, “U.S. Seafood Landings Reach 17-year High in 2011,” *NMFS*, n.d. http://www.nmfs.noaa.gov/mediacenter/2012/09/24_us_seafood_landings_reach_17-year_high_in_2011.html.

²⁴ U.S. Public Law 109-479, SEC. 302. Regional Fishery Management Councils (16 U.S.C. 1852)

²⁵ Peter Van Tuyn and Valerie Brown, “A Look Within: Executive Branch Authority to Ensure Sustainable Fisheries,” *Ocean and Coastal Law Journal*, 14, no. 1 (2008): 15.

original law and Ted Stevens from Alaska collaborated on reauthorization resulting in the definition of federal fisheries management that persists—albeit somewhat altered—today. Until 1976, foreign fleets could fish up to 12 miles off the coast of the United States, rendering enforcement of any limits or regulations impossible. The implementation of the original Magnuson Fisheries Conservation and Management Act of 1976 gave the U.S. control of waters out to 200 miles from shore, and attempted to establish science-based conservation and management through standardizing stock assessment and catch limits. At the time, heavy foreign industrial fishing was exerting significant pressure on U.S. fisheries. Ecologist Carl Safina explains that the law was enacted with two goals: to re-Americanize U.S. fisheries and to conserve and restore the fish. In the years following the act, it became clear that these two goals were fundamentally divergent and the act was failing to conserve fisheries. Safina contends that the practices directed towards re-Americanization and fisheries development such as extending loans and investment incentives to increase fishing capability and industrialize the American fleet directly resulted in a series of tragic overfishing disasters. Fishers impacted by the notable New England Groundfish Disaster were awarded \$2.5 million, “the first drop in the fish relief bucket—unprecedented in the U.S., signal[ing] the beginning of an ominous siphon-like reversal in the economic contribution that fishing can and should be—but is not—making to the economy of the northeast states.”²⁶ The two decades following the implementation of the law saw some of the nations worst fisheries disasters as the government favored fisheries development over conservation resulting in overcapitalization and overfishing.

The law notably delegated management to eight regional fishery management

²⁶ Carl Safina. “Where Have All the Fishes Gone?” *Issues in Science and Technology*, 10, no. 3 (1994).

councils, a unique attempt at stakeholder participation. Safina also attributes some of the conservation failings to the paradox that council seats were occupied by people with knowledge and experience of fisheries. However, councils have been “heavily tilted towards individuals representing fishing groups, resulting in biases so pronounced as to largely account for the failure of the councils to conserve the fish.”²⁷ The first attempt at regulating and conserving fisheries failed as “Americanized” fleets proved just as capable of reckless and destructive fishing as foreign fleets. The first Magnuson Act failed to protect the valuable fisheries resources it had claimed as the property of the American people.

Faced with widespread overfishing, the Act was reauthorized in 1996 as the Magnuson-Stevens Fishery Conservation and Management Act (MSA) amended by the Sustainable Fisheries Act. The MSA included more regulatory constraints, a broader environmental focus and new requirements for measuring and defining overfishing and rebuilding overfished stocks.²⁸ Despite these efforts, regulations again proved ineffective and many stocks were still subject to overfishing and had not been rebuilt prior to the subsequent reauthorization in 2007.²⁹ The most recent reauthorization of the MSA in 2007 required that councils establish Fishery Management Plans (FMPs) with annual catch limits for all stocks and stock assemblages within their jurisdiction. Five years after reauthorization, catch limits for all federally managed stocks were introduced in time for the beginning of the 2012 fishing season, a milestone that NMFS calls “a historic

²⁷ Safina.

²⁸ Galen Tromble and Debra Lambert, “Prelude to Sustainability: Ending Overfishing in U.S. Fisheries,” *Our Living Oceans* 6 (n.d.): 57–66.

²⁹ A.A. Rosenberg, J.H. Swasey and M. Bowman, “Rebuilding U.S. Fisheries: Progress and Problems,” *Frontiers in Ecology and the Environment*, 4, no. 6, (2006): 303-308.

achievement.”³⁰ The 2007 Act included a particular emphasis on considering catch share programs to promote better business, conservation and crew safety. Rebuilding plans were given time limits to hold councils more accountable.³¹ In Congressional hearings prior to the reauthorization of the bill, Senator Inouye from Hawaii emphasized, “Our fisheries’ importance to our Nation both economically and culturally is indisputable. They are a living resource and must be treated as such if they are to sustain communities today and remain viable for future generations. Our task therefore, as the title of the bill makes plain, is to both manage and conserve.”³² Despite historic inadequacies, the continued revision of the Magnuson-Stevens Act currently provides a strong legal framework for managing fisheries.

b. NMFS and Regional Fisheries Councils

NMFS, a branch of NOAA and a subsidiary of the Department of Commerce, is the primary regulatory body for fisheries between 3 and 200 miles offshore. The current iteration of NMFS was created under President Nixon in 1970, however the Office of the Commissioner of Fish and Fisheries created in 1870 directly preceded the organization. Regional Councils created by the MSA are advised by NMFS regional fisheries science centers and regional offices, which represent the science and policy arms of the organization.

My research focuses on the fisheries managed by the Pacific and North Pacific Fishery Management Councils (Figure 1). The North Pacific Fishery Management Council

³⁰ Schwaab, Eric, “Historic Milestone in Fisheries Management Achieved - Annual Catch Limits Now in Place for Most Federal Fisheries.” *NMFS*, January 9, 2012.

http://www.nmfs.noaa.gov/stories/2012/01/1_9_turningcorner2012.html.

³¹ “The Road to End Overfishing: 35 Years of Magnuson Act.” *NMFS*, April 11, 2011.

<http://www.nmfs.noaa.gov/stories/2011/20110411roadendoverfishing.htm>.

³² “Hearing Before the Committee on Commerce, Science and Transportation,” *Reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act*. Washington, D.C.: U.S. Government Printing Office, 2005

(NPFMC) represents the states of Oregon, Washington and Alaska and has jurisdiction over the fisheries in the Arctic Ocean, the Bering Sea and the Pacific Ocean seaward of Alaska.

The council has 11 voting members, 7 appointed by the secretary, 5 from the State of Alaska and 2 from the State of Washington. The Council makes decisions and implements policy based on science conducted by the Alaska Fisheries Science Center located in Seattle, Washington. The Alaska Regional Office serves as NMFS policy advising body to the Council, interpreting the recommendations of the scientific committees, is located in Juneau, Alaska.

The Pacific Fishery Management Council (PFMC) represents the states of California, Oregon, Washington and Idaho and has jurisdiction over the waters seaward of those states. The Council has 14 voting members, including 2 appointed from each state and 1 from a Native American tribe within the states. The PFMC is located in Portland, Oregon. It is supported by scientific research from the Northwest Fisheries Science Center in Seattle, and the Southwest Fisheries Science Center in La Jolla, CA. The Northwest and Southwest Regional offices in Seattle and Long Beach offer policy support. The Councils meet regularly to devise FMPs and amendments to existing FMPs that are ultimately approved by the Department of Commerce for implementation.

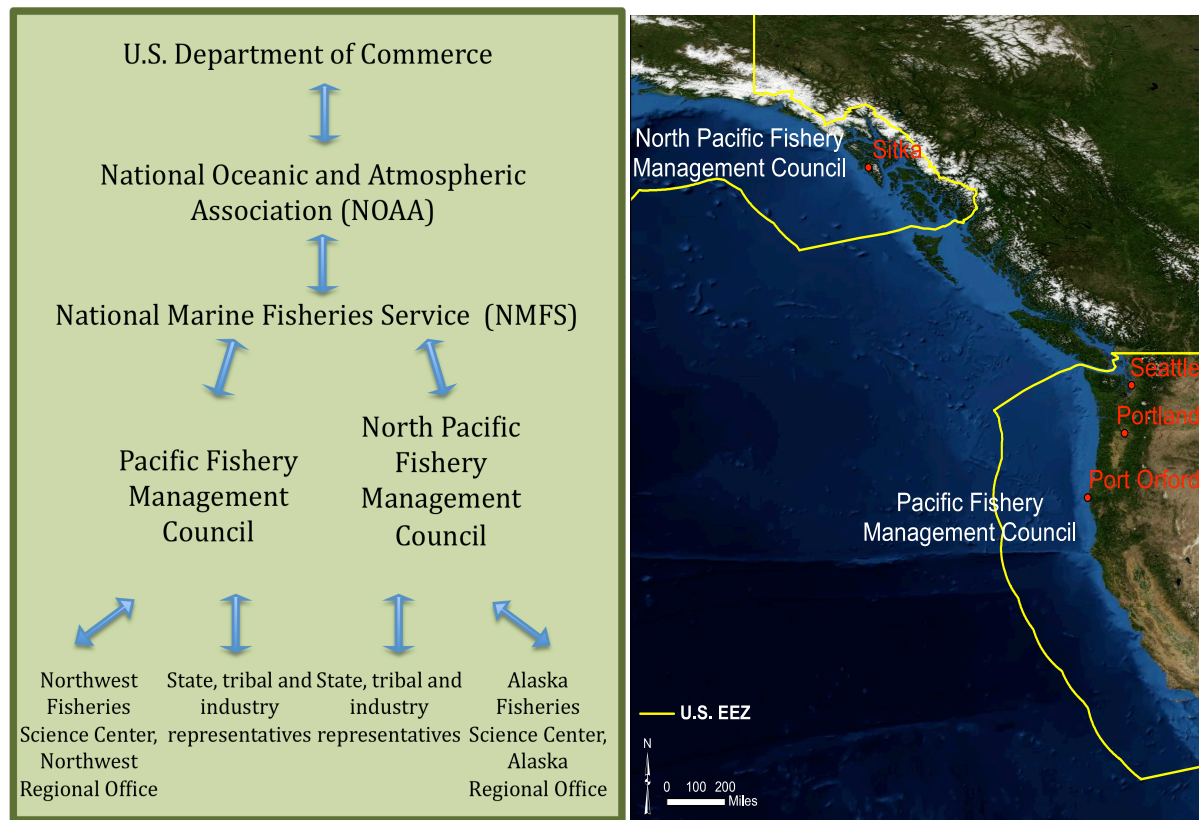


Figure 1. Regulatory framework and geographic bounds for the Pacific and North Pacific Fishery Management Councils. Created by author.

c. Fisheries Science and Stock Assessments

The management decisions that are ultimately implemented are informed by thorough stock assessments. Teams of fisheries scientists and modelers working for regional fisheries science centers recommend catch limits via complex stock assessment processes. The stock assessment groups of the Alaska Fisheries Science Center (AFSC) Northwest Fisheries Science Center (NWFSC) undertake stock assessments to set limits for all of the FMPs within the regions' jurisdiction. Stock assessment science has evolved from simple estimation based on sampling to complex mathematic modeling as scientists develop new strategies try to produce a quantitative answer to the elusive question, "how many fish are in the ocean?" The stock assessment process generally consists of data

collection, population modeling, peer review, review by the scientific and statistical committee of the council, and concludes with a final decision by the council. Dr. Anne Hollowed, the leader of the Status of the Stock and Multispecies Assessment Program (SSMA) at AFSC and member of the NPFMC Scientific and Statistical Committee explains, “It takes all of us in this building to pull this off. It isn’t as if you could just have a survey and a stock assessment group and an aging unit to make this work, your really need the other pieces of research” revealing the collaborative nature and fundamental complexities of stock assessment.³³

The concept of maximum sustainable yield (MSY) underlies the stock assessment process; fisheries are generally managed to “maximize the total production each year” by estimating average catch obtained when stocks are harvested to maximize average catch.³⁴ Though MSY has become accepted as a guiding principle, Smith provides evidence in his history of fisheries science methodology, *Scaling Fisheries*, that MSY is less definitive than we assume. He summarizes the opinion that the concept was “severely criticized as being too simple and too glibly applied,” and quotes a 1975 discussion that concludes, “...maximum sustainable yield has become institutionalized in a more absolute and precise role than intended by the biologists who were responsible for its original formulation.”³⁵ The issue is still debated now; Hollowed explains, “It is controversial...some people pushed and pulled but it is something actually global now that has been pretty much accepted as...sustainable.”³⁶ Even fundamental concepts like the ideal fishing pressure for stock

³³ Anne Hollowed, Personal Interview, July 19, 2012.

³⁴ Smith, 167.

³⁵ Smith, 265-266.

³⁶ Hollowed, July 19.

sustainability are debated, revealing that stock assessment methods are subjectively decided and subject to changes based on the currently accepted ecological assumptions.

Though assessments now are based heavily on mathematical modeling, the models depend on having accurate data, which is often gathered in the field. Hollowed and Dr. Libby Logerwell, an SSMA scientist, credit the observer program for the high quality of data available to AFSC scientists. Federal fisheries observers are stationed on almost all fishing vessels in Alaska to collect samples, record catch totals and other measures and monitor bycatch.³⁷ A NWFSC biologist comments, “the high seas species...because we know less about them, is all model based, you have all these great population models, and...they are only as good as the data that goes in to them.”³⁸ Data collection is expensive and complicated. Despite extensive surveys and observer coverage, many stocks are still characterized by insufficient data.

The modeling process is constantly evolving as techniques become more sophisticated. Teresa A’mar, a modeling scientists at the AFSC who has responsibility for Gulf of Alaska (GOA) Cod and rock sole, explains, “the more complex you make the models, the more uncertainty you have in terms of which data you need...on one end of the spectrum you have single-species models, and on the other end you have these huge, spatial [models].” She finds the discrepancy between what is being done for research and the methods applied to stock assessments an interesting quandary:

...it’s not clear to me what the next steps are that people would be comfortable with. There is a lot of exploration going on. There is always a push to start putting some multi-species interactions into your model. But which interactions do you pick, which change over time, how do you categorize these things? Basically, if you have the wrong certainty, how do you get to management quantities out of a multispecies model, how do you take everything into account? How is that going to change over time?... The more I think about, the more I’m like, at some point somebody is going to come up

³⁷ Dr. Libby Logerwell, Personal Interview, June 6, 2012 and Hollowed, July 19.

³⁸ Dr. Jim Myers, Personal Interview, June 15, 2012.

with enough to say, 'ok this is the next step, everybody needs to be doing this.' Because there is a lot of exploration, a lot of research that is going on...past doing single-species...it hasn't been...operational. So that's kind of what I'm waiting for.³⁹

Despite the mathematical rigor and thorough data collection, other fisheries biologists argue that modeling has become “almost faith-based,” as insufficient data can mask statistically significant fishing impacts.⁴⁰ Modeling is a critical component in the stock assessment process as it allows managers to translate survey and observer data into catch recommendations. In addition to population models, management science is moving towards incorporating ideas of “ecosystems-based management,” where ecosystem consideration and species-interactions are considered in setting catch limits by incorporating them into models or altering final decisions. Alaska scientists and managers have been leaders in this field, incorporating measures such as overall cap of two million tons of biomass that can be extracted from the Bering Sea.⁴¹ However, unknown factors like climate change and ocean acidification, which particularly impacting sensitive environments like Puget Sound, make projections problematic.

After thorough peer review, stock assessments are provided to the Council, and Council members decide which models and scenarios they will use to set catch limits. The council decision process introduces an additional level of uncertainty, which some skeptics challenge. Logerwell uses the Pollock fishery to illustrate: when it is said, “Pollock is well managed and it is not overfished, we mean that the population levels are above the threshold that has been defined by us and the law. So you could talk to conservation groups that would say that it's not well-managed.”⁴² Conservation groups like Greenpeace

³⁹ Dr. Z. Teresa A'mar, Personal Interview, June 15, 2012.

⁴⁰ Pers. Comm.

⁴¹ Hollowed, July 19.

⁴² Logerwell, June 6.

disagree with the fundamental idea that stocks can be fished at MSY for decades.⁴³ Though these critiques are generally discredited as radical and unfounded, stock assessors demonstrates how the population assessment shifts if you use different baseline years for Pollock. Some wonder if an absolute biomass minimum limit should be implemented to safeguard this commercial critical stock.⁴⁴ In terms of the decision process within the council, a NMFS scientist qualifies:

A cynical person would say that the industry has the highest priority. Because you know the way the councils are set up there is a science body, an industry body, and then an overall kind of governing body...it kind of becomes a balance between industry and science. So it's a compromise between those two. And somewhere in there is human-well that's part of industry, is the human needs, clearly. So I would say it's a compromise.⁴⁵

In Alaska, scientists feel confident that the Council generally follows scientific recommendations, acting to preserve the long-term sustainability of resources to a greater degree than in some other regions. Conservation representatives also advise council decisions, and meetings are open to public commentary. Though the stock assessment process that informs our definitions of sustainable harvest and provides the basis for management decisions is scientific and mathematical, the interpretation depends on human actors and the process evolves as scientists learn more about the dynamics and resilience of commercial stocks.

III. Recent Regulatory Policies and Actions

Fisheries management is constantly evolving to meet the demands of safeguarding the sustainability of the resource while ensuring that jobs and food sources are protected. Smith explains that managers are under constant pressure to overcome the obstacle "...too

⁴³ "Too Little, Too Late for Largest U.S. Fishery," *Greenpeace*, October 1, 2009, <http://www.greenpeace.org/usa/en/news-and-blogs/news/too-little-too-late-for-large/>.

⁴⁴ Pers. Comm.

⁴⁵ NMFS Scientist.

often the case in fisheries studies, the need to take action tends to override the necessarily slow pace of science.”⁴⁶ In hindsight, management decisions may be regarded as trial and error. One of the shifting philosophies underlying fisheries management is the concept of access. Initially, an open access resource, collapsing stocks provoked changing restrictions and regulations of access rights to the fisheries.

a. Open Access to Limited Entry

Until the U.S. Fisheries Conservation and Management act of 1976 and the International Law of the Sea in the 1974, fisheries were exploited recreationally, for subsistence and commercially with minimal restriction or regulation. Despite the lack of consideration for the finite nature of the resource suggested by the apparent absence of regulation, Congress passed the Joint Resolution for the Protection and Preservation of Food Fisheries off the Coast of the United States as early as 1871. The resolution stated that “...the most valuable food fishes of the coast and the lakes of the US are rapidly diminishing in number, to the public injury, and so as materially to affect the interests of trade and commerce....” and tasked a commissioner of fisheries with assessing this purported depletion.”⁴⁷ Though the fishing industry at that time bore little resemblance to the industrial fisheries of today, Congress recognized the risk of overexploitation. Today, managers would add protection of ecosystems and ecosystem function to trade and commerce, but economic factors persist as a primary motivator for maintaining healthy fisheries.

⁴⁶ Smith, 99-100.

⁴⁷ “Information on Fisheries Management of the United States of America,” *FAO*, n.d. <http://www.fao.org/fi/oldsite/FCP/en/USA/body.htm>, U. S. Department of Commerce, National Oceanic and Atmospheric Administration, “Fisheries Resolution, Forty-First Congress Session 3, Res. 18, 19, 20, 21, 22. 1871.” *NOAA Central Library*, n.d. <http://www.lib.noaa.gov/noaainfo/heritage/FisheriesResolution.html>.

Faced with reports from fishermen and scientists in the 1960's and 1970's of severely depleted stocks, President Ford signed into action the MSA. The act tasked the U.S. with the singular responsibility of "wise use" of the resource as a criteria of assuming exclusive rights to the Territorial Sea and the EEZ. Subsequently, managers, scientists and government officials began discussing the best management techniques to become national policy.⁴⁸ From a contemporary vantage, limiting access seems to be an obvious step in preventing the overexploitation of fish resources, however this concept was highly objectionable to those accustomed to open access. During a 1978 symposium considering limited entry as a management strategy, Senator and fisheries management luminary Warren Magnuson cautiously introduced the discussion of limited access as a potential management strategy,

This symposium is dedicated to an examination of alternative management techniques—namely those based primarily upon economic rationale. These are considered radical, unnecessary and disruptive by some, but to others they are an attempt to cure fundamental problems inherent in managing common property resources. I do not necessarily endorse any of the specific suggestions, statements, or recommendations made here. However, our fishery resources are of such significance to the welfare of our nation that all reasonable management tools available should be carefully considered.

Magnuson advocated for commercial fishers and managers to change something much more fundamental than the policy that fisheries were managed under, he was asking the stakeholders to adopt a new paradigm for thinking about the ocean's fish resources. The new paradigm was one in which commercial and recreational fishers were granted the privilege of access by governmental authority rather than possessing the right to fish. Fisheries managers moved towards unique limited access programs for many fisheries. A

⁴⁸ Bruce R. Rettig, ed., and Jay Ginter, ed., *Limited Entry as a Fishery Management Tool*, Seattle: University of Washington Press, 1982.

1985 speech entitled “The Historical Development of Fisheries Science and Management,” given at the Fisheries Centennial Celebration by fisheries researcher William F. Royce, emphasized this paradigm shift, asking the public to understand that common pool, open access resources conflict with the motives of business. Commercial fisheries must be regulated because “...governments are in the fish business as the owner of limited resources and by allowing unlimited opportunities to establish private businesses, governments are preventing each business from managing properly a fundamental function of any business—matching the investment to the expected return.”⁴⁹ Early examples of limited entry included salmon fisheries off the coast of British Columbia, Washington and Alaska.

Limited entry programs limited the number of permits issued per fishery, and often exacted other restrictions on vessel tonnage, length and gear type. Limited entry programs resulted in managers “chasing” fishing effort with restrictions that were rapidly circumvented after implementation. These forms of management often failed to remedy overcapitalized fisheries and resulted in extremely short openers that produced a “race for fish” and derby style conditions.⁵⁰ These conditions produced low quality, often frozen, products that flooded the market for a short time and then became unavailable coming with the price of environmentally and socially destructive fishing practices. Though fisheries managers attempted to create fishing conditions that were more economically and ecologically sustainable, in many cases restriction pitted managers and scientists against

⁴⁹ William F. Royce, “Historical Development of Fisheries Science,” *NEFC, NOAA*, 1985. http://www.nefsc.noaa.gov/history/stories/fsh_sci_history2.html.

⁵⁰ James Willen, “Limited Entry Licensing: A Retrospective Assessment,” *Marine Resource Economics* 5 (1988.): 313–324.

fishermen and increased competition within the fleet. Limited entry management was relatively unsuccessful for some fisheries on the West Coast. For example, salmon are still managed under a limited entry system, and collapsing stocks and economic inefficiencies plague these fisheries from California to Alaska.⁵¹

b. From Limited Entry to Catch Shares

Faced with overcapitalized, inefficient, destructive and dangerous fisheries, the 1990's saw the Regional Fishery Management Councils, with the support of NMFS, begin to shift FMPs to more targeted management models known under the umbrella term of "catch shares." NMFS defines "catch share" as "a general term for several fishery management strategies that allocate a specific portion of the total allowable fishery catch to individuals, cooperatives, communities or other entities."⁵² The first national catch share program was designed for the Mid-Atlantic surf clam on the East Coast in 1990; the first program in the West was the Halibut and Sablefish Individual Fishing Quota (IFQ) program in 1995. Following the development of this initial catch share program, the Bering Sea and Aleutian Islands (BSAI) Pollock fleet was transitioned to a cooperative based catch share program under the American Fisheries Act in 1998.⁵³ The NPFMC operates management policies considered catch shares for BSAI Crab, GOA Rockfish, Pacific Cod, Amendment 80 non-Pollock groundfish and other stock assemblages, and Community Development Quota allocations.⁵⁴ The PFMC recently implemented the Amendment 20 groundfish catch share

⁵¹ Myers, June 15.

⁵²NMFS, "NOAA Catch Share Policy", November 4, 2010.

http://www.nmfs.noaa.gov/sfa/domes_fish/catchshare/docs/noaa_cs_policy.pdf.

⁵³Roddy Scheer, "'Catch Shares' Save Fish Populations--and the Fishing Industry", September 10, 2010, <http://www.scientificamerican.com/article.cfm?id=catch-shares-for-saving-fish-populations>.

⁵⁴ Fina, Mark. "Evolution of Catch Share Management: Lessons from Catch Share Management in the North Pacific." *Fisheries* 36, no. 4 (April 2011): 165.

allocation program, allocating groundfish stocks primarily to West Coast trawlers.⁵⁵ NMFS maintains that the goal of catch share management programs is to rebuild fisheries and support the fishermen and fishing communities participating in the industry in order to preserve the “cultural and resource access traditions that have been part of this country since its founding.”⁵⁶ The National Catch Share Policy states that NMFS recommends and encourages carefully constructed catch share programs where appropriate because catch share management has proven itself as an effective tool for eliminating both overfishing and a race for fish and thus making fisheries safer, more profitable and more sustainable.⁵⁷

Despite apparent confidence in catch share management and the inherent opportunity to create specialized management regimes involving stakeholder input, transitioning all possible fisheries to catch share does not necessarily provide a perfect solution to the difficult balance between the social, economic and biological complexities of healthy fisheries. Catch shares depend on allocation, and often allocations favor larger-scale fisheries out of larger ports, disadvantaging small coastal fishing communities.⁵⁸ In a report summarizing a meeting entitled “Community Dimensions of the Catch Share Policy,” environmental non-profit organization Ecotrust calls the implementation of catch shares into question:

The tendency thus far has been for catch share programs to default to individual quota systems with little or no consideration of community-related alternatives in how quota shares are assigned and to what entities.[...]Many fisheries management councils have fallen short in adequately analyzing and addressing the effects of existing and planned catch share programs on communities where livelihoods and economic viability depend on fisheries.⁵⁹

Though the National Catch Share Policy focuses heavily on the opportunities to protect

⁵⁵ “Pacific Fishery Management Council.”

⁵⁶ “NOAA Catch Share Policy.”

⁵⁷ “NOAA Catch Share Policy.”

⁵⁸ Fina, 175.

⁵⁹ Ecotrust, “Community Dimensions of Fisheries Catch Share Programs: Integrating Economy, Equity, and Environment”, March 15, 2011, http://www.ecotrust.org/fisheries/NPCDFCSP_paper_031511.pdf.

economies and working waterfronts in fishing communities by citing the legal terms of “Fishing Community” and “Regional Fishing Association” defined within the Magnuson-Stevens Act as key players in the design and implementation of catch share, coastal fishing communities have struggled to adapt to catch share management.

IV. Research Focus

According to the current science, fisheries management on the West Coast has effectively prevented large-scale overfishing crises. However, as management regimes are continually adjusted, the economic and social aspects of fisheries must also adjust and have not yet reached a stable consensus demonstrating sustainability. I will explore the impacts of fisheries policy in small fishing communities on the West Coast, and the responses within these communities to policy such as the implementation of catch share programs. Councils and managers are legally bound by the MSA to consider fishing communities in management decisions. Section 301, 104-297 states that “Conservation and management measures shall...take into account the importance of fishery 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.”⁶⁰ Beyond the legal obligations, fishing provides the very concrete benefits of jobs and food to society. Culturally, we value and are captivated by fishing towns and the men and women who make their living at sea. These people and the places they inhabit occupy a place of great significance in the collective American imagination. Despite the legal and cultural importance and the community considerations clearly present in national policy, there seems to be a divide between the policy goals and the reality in fishing

⁶⁰ U.S. Public Law 109-479, SEC. 301. National Standards For Fishery Conservation and Management (16 U.S.C. 1851)

communities. I will explore how places demonstrating emerging models of community-based co-management navigate these conflicts as they define their organization structures, purposes and relationships to existing fisheries management paradigms.

To address these questions, I focus on my experiences researching the fishing-management interface in two primary sites: Sitka, Alaska; Port Orford; Oregon; while also examining San Diego, California and Santa Barbara, California to broaden the discussion. This is by no means a complete representation of fishing communities pursuing local management strategies on the West Coast. Furthermore, these communities do not represent community-based resource management in the same ways. These communities are pursuing community-based co-management strategies because individual members believe that the communities stand to benefit from taking a greater role in managing their resources, but also because of a sense of urgency that a changing industry and changing regulatory goals threaten the long-term viability of independent, small-scale fisheries.

Chapter 2: Methodology

I. Overview

My research began during the summer of 2012, with funding from the Pomona Summer Undergraduate Research Program. I based my research in Seattle, interviewing fisheries scientists about the science and management of regional fisheries. I complemented my research in Seattle by visiting fishing communities along the West Coast, interviewing scientists, managers and fishermen. I continued my research during the fall of 2012 while writing this thesis, reading background literature, visiting sites in California and conducting phone interviews. In total, I conducted 29 interviews with NOAA scientists and policymakers, NGO personnel working on fisheries policy and sustainability, commercial fishermen, residents of fishing communities, seafood direct marketing groups, and a University of Washington fisheries science professor. The majority of interviews were recorded, transcribed and coded using Atlas ti software. I prepared questions in advance of most interviews, although questions differed greatly depending on whom I was interviewing. I also deviated significantly from the prepared questions during interviews, preferring a conversational approach. Thus, my interviews ranged from semi-structured to unstructured. I employed snowball sampling to gain access to my interviewees. In terms of my field visits and observation, I am heavily indebted to the Community Fisheries Network (CFN), organized by Ecotrust and the Island Institute, for their list of members, which helped to confirm the relevance of the communities I selected to conduct fieldwork about community based fisheries management.⁶¹ In my interviews, I sought to learn from

⁶¹ “Community Fisheries Network”, n.d. <http://www.communityfisheriesnetwork.org/>.

people first about their work, and subsequently ask questions more related to my research. I recorded thorough field notes during field visits.

II. Study Sites

The research I conducted was highly place-based, thus I will discuss my methodology on a place-by-place basis.

a. Seattle, Washington

I started my research in Seattle. Fishing plays a major economic and cultural role in Seattle, and the city is a hub for science and management. I initially visited fish markets and even grocery stores in the city, observing the sheer quantities of fish, the prevalence of advertising and various advertising strategies, such as labeling fish as certified sustainable by the Marine Stewardship Council or “Best Choice” under the Monterey Bay Aquarium criteria. I then focused on learning about the science behind fisheries management. Seattle maintains the largest NOAA campus outside of headquarters in Washington D.C. The campus contains the AFSC as well as the NWFSC. I attended an open house of NOAA research facilities and a panel discussion about sustainable seafood. I interviewed nine fisheries scientists working for NMFS at the Alaska Fisheries Science Center and the Northwest Fisheries Science Center as well as Ray Hilborn, a scientist with the University of Washington. I observed work in the food habits lab of the AFSC as well. While in Seattle, I conducted phone interviews with a GIS analyst, fisheries managers at the Alaska Regional Office in Juneau, an Alaska salmon fisherman and environmental luminary Bill Ruckelshaus. I also interviewed a representative from a seafood labeling organization, a director of the Observer program and a fisheries fieldwork researcher.

b. Portland, Oregon

Pursuing information published by the organization Ecotrust, I traveled to Portland to Ecotrust's head quarters. I interviewed fisheries policy Associate Megan Mackey about the community impacts of the catch share program. In Portland, I learned of the CFN, which helped further shape my fieldwork.

c. Port Orford, Oregon.

I visited the community of Port Orford, Oregon, to learn about the work of the Port Orford Ocean Resource Team in advocating for localized, community-based management. I interviewed the directors and staff of the organization, who are members of the fishing community. I interviewed two commercial fishermen who are board members for the organization and coordinators of the Port Orford Sustainable Seafood, the community supported fishery, as well as I engaged in many informal and unrecorded conversations with other staff and board members. I attended a meeting about a mapping project for management of the territorial sea off the coast of Oregon that included the input of fishermen, as well as a regional workshop led by POORT about incorporating ecosystem-based management into local and regional planning.

d. Sitka, Alaska

I visited Sitka, Alaska, to learn about the role of the Alaska Longline Fishermen's Association (ALFA) in defining and supporting a clean, community-based fishery in a region known for industrial fishing. I interviewed and had informal conversations with the director of ALFA, Linda Behnken, individual ALFA members and longline fishermen. I also interviewed the coordinator of the Alaskan's Own CSF, Natalie Sattler, who provides fresh seafood on a share basis to Sitka and Juneau through the program. In Sitka, assisting with

an ALFA survey, I walked the docks, meeting fishermen both involved and not involved in the organization. The Alaska Marine Conservation Council and the Alaska Jig Association are organizations working on community-based fisheries issues, though I did not research these examples.

e. Juneau, Alaska

After Sitka, I traveled to the state capital and center of fisheries management in Juneau. I conducted a group interview with the staff of the Restricted Access Management team. The RAM staff shared in depth information about the initial construction and implementation of catch share programs in the North Pacific. While in Juneau, I observed the prevalence of seafood marketing groups and other fishery related industries.

f. San Diego, California

During an interview, I was informed of efforts to implement models of community-based fisheries management along the California coast. I traveled to San Diego to interview Peter Halmay, urchin diver and director of the San Diego fishermen's working group. I learned about efforts to preserve the fishing industry in San Diego and innovative partnerships between scientists and fishermen to collect comprehensive data about the resource.

g. Santa Barbara, California

Though I did not visit or conduct extensive interviews with members of the fishing industry in Santa Barbara, I briefly include this case in my analysis. The fishing community, in partnership with researchers from the University of California Santa Barbara is pursuing collaborative research and exploring community based co-management models. I interviewed Jono Wilson, a post-doctorate who conducted research with local fishermen

about the impact of marine protected areas, over the phone. I contacted local fishermen Chris Miller and the organizer of the Santa Barbara CSF, but did not interview them. Both San Francisco and Morro Bay, California are working on community-based approaches to fisheries management, though I did not have the opportunity to research these cases.

Chapter 3: Results—Management Ideas in Practice

Through field visits to study sites and interviews with community members, fishers, and staff representing local fishing organizations, I evaluated locations on the West Coast where community stakeholders are working to develop functional models for co-management of fisheries. In some cases, fishing communities around the country are organizing to both define and exercise options found within existing policies to preserve their independence and viability in response to the negative consequences of new programs like catch shares and sector management. These responses are developing in the context of 2007 MSA promoting consideration of catch shares. The Act carries an accompanying clause that requires management decisions to be evaluated for their impact on communities, demonstrating a greater value of community considerations than in the past. The MSA defines some important options for navigating these changing management models. The MSA includes a definition of a Regional Fishing Association (RFA), a voluntary association of industry participants, as one option for communities to participate more fully in local and regional management.⁶² Borrowing elements from RFAs, some fishing communities have opted to work towards forming Community Fishing Associations (CFAs), a new and legally undefined term that combines the quota holding capabilities of RFAs with a more binding, place-based focus on community sustainability. Neither the law nor management bodies have outlined CFA criteria, so communities and organizations have jumped at the opportunity to self-define these structures in hopes of shaping policy. The

⁶² Sara Randall and Nate Grader, “PCFFA Fishermen’s News Column, March 2009: Community Fishing Associations,” *Pacific Coast Federation of Fishermen’s Associations*, March 2009, <http://www.pcffa.org/fn-mar09.htm>.

earliest attempts to create CFAs (though the term had not yet emerged) were on the East Coast, with the development of the Cape Cod Commercial Hook Fishermen's Association in 1991 and the affiliated Cape Cod Fisheries Trust, which finances quota leasing.⁶³ Fishing communities on the East Coast were well suited to this type of organization, with small-boat fleets, strong historical and cultural fishing identity, and high value, sessile species like lobster and scallops. Despite advantages afforded by providing opportunities for secure investments in high value species, organizing a CFA remains complicated.

In recent years, fishing communities on the West Coast have begun to pursue a greater role in management by self-defining and forming these new organizational structures as problems such as declining access, consolidating fleets and implementation of catch shares emerge. Divergent fishing industries provide different obstacles on the West Coast than in the East. These differences include the coast-wide management of a relatively industrial fleet, and the difficulty of adapting community-based co-management to regulate of open ocean, mobile species.

The Island Institute, an East Coast non-profit, partnered with Ecotrust, an Oregon-based organization to bring together the resources and collective knowledge of communities attempting to form local management organizations. The product of this collaboration, the Community Fisheries Network, consists of thirteen organizations now considered prototypes of CFA's. Each organization was formed independently for different reasons and with different goals; not all are seeking to hold or lease quota to local fishermen. These organizations do share the broader of achieving a balance of social,

⁶³ "Cape Cod Fisheries Trust," *Cape Cod Commercial Hook Fishermen's Association*, 2009, <http://www.ccchfa.org/trust/>.

biological and economic sustainability within their local and historic fisheries by assuming a larger management role.

I. Port Orford, Oregon

The small fishing hamlet of Port Orford sits on the rugged coast of Southern Oregon. A quiet town with no stoplights, 1,153 people called Port Orford home. The population has remained relatively stable over the past 50 years despite the collapse of the logging industry, boom and bust cycles of various fisheries and a slow transition to a service-based economy.⁶⁴ Port Orford has sustained continuous commercial fishing since it was founded in 1851. Though natural resource jobs are only reported to employ about nine percent of the population, adjusting for self-employment increases this figure, to an estimate that fishing employs at least 25 percent of the population.⁶⁵ Fishing income feeds the local small businesses and attracts tourism dollars. Unlike most Oregon fishing towns, the harbor in Port Orford is not protected by an estuary, but rather situated in an exposed bay that is not fed by a river. It is one of few ocean harbors in Oregon. Because of this, fishing boats must be dry docked and lowered into the water by a crane, limiting their size to about 40 feet. In 2000, 80 vessels landed fish in Port Orford; residents owned 45 vessels bringing in around 5 million dollars. Major target species include crab, groundfish, salmon, highly migratory species and shrimp. Fishers hold both state and federal permits, though only about 20 boats participated in the federally managed groundfish fishery in 2000. These numbers may have changed since 2000, when the community profiles for Pacific

⁶⁴ K. Norman et al., Community Profiles. for West Coast and North Pacific fisheries—Washington, Oregon, California, and other U.S. states, U.S. Dept. Commer., NOAA Tech. Memo, NMFS-NWFSC-85, (2007): 320.

⁶⁵ “Port Orford Ocean Resource Team”, n.d. <http://www.oceanresourceteam.org/>.

coast fishing towns were created.⁶⁶ Though Port Orford is a small fishing community, it has taken a leading role nationally in defining community co-management of fishery resource, lead by the active organization the Port Orford Ocean Resource Team (POORT). POORT received NOAA's 2012 Award of Excellence for Non-Governmental Organization of the Year and the Governor's Gold Award for the leadership that the organization has shown in developing innovative, science and community-based sustainable fisheries management. POORT's mission is to "ensure the long-term sustainability of Port Orford's ocean resources and our community that depends on them by uniting science, education, local expertise and conservation."⁶⁷ I undertook my research about fishing in Port Orford through the lens of the ideas and opinions of POORT, relying on information and support from the organization. A wider variety of perspectives present in the community may not be represented in the following discussion. POORT is spearheading the organizational effort to address the question of community-based fisheries co-management.

a. Port Orford's Response to Current Fisheries Management and Policy

i. Conflicts with Management Decisions

Port Orford fishers have come into conflict with fisheries managers at both the state and federal level over management decisions and policy enforcement. The fishermen participate in both state-managed near shore fisheries and federally managed fisheries further offshore, and thus interact with both NMFS and the Oregon Department of Fish and Wildlife (ODFW). Leesa Cobb, the director of POORT and a fisherman's wife, cites frustration with attempts to work with ODFW, "We have a memorandum of understanding with the Department of Fish and Wildlife that we developed for policy space for our work

⁶⁶ Norman, 320.

⁶⁷ "Port Orford Ocean Resource Team."

at the community level and the MOU turns out to be useless. The state is either unwilling to work at the community level.”⁶⁸ Other community members and fishermen who have dealt with the state echo her frustrations.

In terms of the relationship with federal management, the income and fishing opportunity of local fishermen has been negatively impacted by the implementation of coast wide Rockfish Conservation Areas (RCAs) that are completely closed to certain gear types to protect depleted rockfish stocks.⁶⁹ Leesa comments, “the fish stocks on the West Coast with a couple of exceptions are managed coast wide, and that really isn’t the range of the stocks,” suggesting that the scale of the conservation project has unnecessary adverse effects on the local industry. Lyle Keeler, a local fisherman and member of POORT’s board, explains that “the RCA is definitely doing the job—it’s overkill, that’s the problem.” He illustrates his point using the story of the Yelloweye Rockfish. In the seventies, Yelloweye were plentiful, but declined drastically when bottom-trawl vessels, called draggers, arrived and increased fishing pressure. After a few years of intensive fishing, one could catch only a fraction of what one caught before the draggers arrived. Years later, the RCAs were implemented to aid in the recovery of the stocks, some of which are particularly long lived, deep ocean species. Off the coast of Port Orford, Yelloweye have now expanded to a greater range than Lyle observed even in the seventies. Lyle says that managers threaten to shut off the nearshore fishery for catching too much Yelloweye. He argues vehemently that there are plenty of Yelloweye out there, and the Yelloweye turning up on fishers’ hooks are not a bycatch problem but rather an indicator that stocks have recovered.⁷⁰ Port Orford

⁶⁸ Leesa Cobb, Personal Interview, July 9, 2012.

⁶⁹ “Pacific Fishery Management Council.”

⁷⁰ Lyle Keeler, Personal Interview, July 12, 2012.

fishers are conservation advocates, but argue that coast wide programs reduce fishing efforts more than is necessary for the conservation of some stocks.

The story of management mismatches repeats across additional target species. Cobb explains a similar problem with lingcod: Port Orford fishermen found themselves saddled with highly restrictive lingcod quotas, while they knew that the local abundance had not changed. Upon investigation, they found that the stock assessment for lingcod had occurred off the Washington Coast, under completely different fishing pressure and environmental conditions. Another local fisherman and POORT board member echoes concerns with the accuracy and relevance of stock assessments, claiming that stock assessments frequently have up to 35 percent error, making sound management difficult and causing fishermen to lose profits. He attributes inadequately funded and subpar fisheries science to a lack of social pressure because fish is not the primary protein source in America.⁷¹

Halibut management also presents problems for Port Orford fishermen. Cobb explains that halibut management is still open access, controlled by “openers” rather than quota allotments. Because of declines in coast wide halibut stocks, Port Orford receives only one or two approximately ten-hour halibut openers per year. This arrangement lends itself to dangerous derby-style fishing, as fishers feel compelled to go out during the openers for high value halibut despite weather or harbor conditions. During the time I was in Port Orford, fishermen were insisting upon going out for an opener despite a forecast for screaming winds and a harbor rendered excessively dangerous by infrequent dredging by the Army Corps of Engineers. These openers are the only time that permit-holders are

⁷¹ Port Orford Fisherman, July 8, 2012.

allowed to catch halibut, despite the fact that fishermen catch halibut throughout the season while fishing for other species. They must discard this halibut at an 18 percent mortality rate so that they have legal access during the openers. Cobb has been working to address this problem for the past seven years. From the perspective of local fishermen, some of the regulation and management of Port Orford's fisheries appear out of alignment with the economic needs and ecological realities.

Conflict and frustration with local fisheries management occurs not just over logistics, but also over the treatment of fishermen by managers and regulators. Port Orford fishermen complain of being cited by NMFS marshals for crossing the RCA while setting fishing lines outside of the conservation areas, as well as expressing concerns about receiving citations for infractions such as drifting into the RCA while sleeping during the night. Others tell stories of being boarded by the coast guard bearing guns for supposed fishing violations. By contrast, when a fisherman entered the Redfish Rocks Marine Reserve, a no-take zone designated by POORT and the community and recognized by ODFW, the police response was to meet the boat at the dock after a full day of fishing in the closed area. Cobb explains that the conflicts are not simply about complying with regulations; most fishermen are willing to comply, with the exception of a few who chafe under any amount of regulation on principle. The antagonism between fishers and regulators stems from a guilty until proven innocent attitude that the fishers perceive as the management standard. She repeats, "They won't give us any room to manage ourselves." While relationships between fishers, managers and regulators have often been tense in Port Orford, recent directions in fisheries policy and management have brought tensions to a head.

ii. Growing Tensions with Catch Shares

In 2011, the implementation of a catch share system for the West Coast groundfish created new tensions between Port Orford and fisheries managers. Port Orford ended up on the losing side of a new fisheries management policy, galvanizing a preexisting commitment to pursuing community co-management. Under Amendment 20 and 21 to the West Coast Groundfish Fishery Management Plan, the Pacific Fishery Management Council (PFMC) made the decision to rationalize the West Coast Groundfish Trawl Fishery comprised of the 90 species of groundfish off the coast of Washington, Oregon and California that are harvested with trawl gear.⁷² Amendment 20 outlined, “an individual fishing quota (IFQ) program for the shore-based trawl fleet; and, cooperative (co-op) programs for the at-sea trawl fleet.”⁷³ Amendment 21 allocated the IFQ shares within the trawl sector. Bottom trawling is a highly contentious fishing method. It has been compared to clear-cutting the ocean floor, because it dramatically alters bathymetries characterized by considerable vertical structure. However, Hilborn argues that bottom trawling is not comparable to clear cutting because it is repeated in the same place yearly, and may not negatively impact soft-bottom areas.⁷⁴ Despite discrepancies, fishers in Port Orford see trawling as destructive and responsible for high levels of bycatch.

The goals of the trawl rationalization program are to “increase net economic benefits, create individual economic stability, provide full utilization of the trawl sector allocation, consider environmental impacts, and achieve individual accountability of catch

⁷² “Groundfish: Background,” *Pacific Fishery Management Council*, n.d. <http://www.pcouncil.org/groundfish/background/>.

⁷³ “FMP: Amendment 20 | Pacific Fishery Management Council”, n.d., <http://www.pcouncil.org/groundfish/fishery-management-plan/fmp-amendment-20/>.

⁷⁴ Hilborn, “Moving to Sustainability by Learning from Successful Fisheries.”

and bycatch.”⁷⁵ Reports from the first year indicated that the measures successfully reduced bycatch in the fishery, due in a large part to the provision of complete observer coverage that the measure helps fund. Under full observer coverage, all trawling vessels have a NMFS observer on board recording bycatch, species caught and other measurements. Both profits and catch totals were higher for 2011, while number of vessels decreased slightly compared to trends of previous years.⁷⁶ However, some fisheries policy experts believe that the subject is controversial. Because catch shares dedicate a secure share of fish to individual fishermen, cooperatives or fishing communities for their exclusive use, some argue that this management tool privatizes a public resource. Depending on the method of allocating shares, some historical participants, such as the fixed gear fleet in Port Orford, can be excluded from the initial allocation. This new conflict in Port Orford over catch shares represents a concrete manifestation of the ongoing problems with implementing the catch share and sector management that were previously mentioned. Communities such as Cape Cod on the East Coast and other West Coast communities are actively working to organize to mitigate the adverse effects of the implementation of these programs and preserve commercial fishing.

From the surface, the trawl rationalization program appears to have been a successful management decision for West Coast groundfish. However, the potential adverse affects for some fishing communities due to consolidation and restricted access cited by the Environmental Impact Assessment have hit Port Orford hard. The

⁷⁵ “FMP: Amendment 20 | Pacific Fishery Management Council.”

⁷⁶ Hal Bernton. “Dividing the Catch: Controversial Quota System Results in Fewer Fish Being Discarded at Sea.” *The Seattle Times*. Seattle, June 30, 2012.

rationalization allocated the Limited Access sector, approximately 90 percent of the resource, entirely to the trawlers, leaving the lower impact fixed gear fleet, comprised of hook and line, trap and pot fishers and recreational fishers with a soft allocation between groups. This leaves recreation and fixed- gear to fight over the remaining amount left at some point in the future. Under the FMP amendments, the trawlers have the opportunity to switch to fixed gear, which is the gear that Port Orford fishermen use to net a higher value product. This measure was intended as an incentive to make the fishery cleaner, but along with an imbalanced allocation it has devastated the price point for the fish caught in Port Orford as big-boat commercial trawlers switch to fixed gear. According to POORT, about a third of black cod quota allocated to trawlers was landed with fixed gear during the first year of the program, taking advantage of the gear switching provisions and causing the market for Port Orford fishermen to plummet. Leesa Cobb voices the frustration of the fishing community:

The entire process is set up with fishery councils and state Fish and Wildlife Commissions... for John Smith who owns the vessel the John Smith II to come in and talk about his business, there is no policy space for communities, and so when I would go to the council meetings and talk about my community, Port Orford...their eyes would glaze over. To me, speaking about the needs of a fishing community supersedes any individual's needs or desires, but it is absolutely not how the system is set up.... We don't think we should have to suffer the un—well they are not unintended—consequences of this trawl IQ program. [The council did not] even do the analysis they were required to do by law about what will happen to us when they turn this program loose on us...

To add insult to injury, Cobb highlights that despite lofty conservation and stock recovery goals, allocating quota to trawlers gives “the fish to the dirtiest gear, to the gear with the highest bycatch rate.” Others in the community echo her frustration with the program. Aaron, fisherman and director of Port Orford Sustainable Seafood (POSS), the community's direct marketing brand, comments, “Well, you know, corporations are people too. It's really kind of the same thing, its really not too far removed from privatization of a public

resource, and just the way that everything is turning and moving. It's frightening."⁷⁷

Another POORT staff member doubts the integrity of the allocation process, "...it seems like the council is turning a blind eye to us, to small communities, because...the council is dominated by big trawl interests...Money talks pretty loud in the council."

POORT and the local fishing community believe that the trawl rationalization program implemented in 2011 by the PFMF conflicts with the law delineated in the MSA. POORT joined the Pacific Coast Federation of Fishermen's Associations and the San Francisco Crab Boat Owners Association to file a lawsuit in October 2010 for injunctive relief from the trawl rationalization program against Gary Locke, the Secretary of Commerce, NOAA and NMFS. The lawsuit is based on the claim that the Groundfish IFQ Program will result in a loss of fishing opportunities, damage to fishery resources and habitats as well as instability in established markets. Furthermore, the suit alleges that the IFQ program "fails to carry out Congressional purpose" to conserve fishery resources, prevent privatization and ensure inclusiveness, in addition to the allegation that the program disregards the existing scientific research. The suit also alleges that the Program fails to provide adequate consideration for fishing communities who might be adversely affected, and that Environmental Impact Assessments of the program did not meet NEPA standards. The plaintiffs allege that the Program's primary motivation was making the fishery more profitable and efficient for the trawl sector, an approach no longer acceptable after the enactment of the 2007 MSA, which now requires programs to consider efficiency only when practicable.⁷⁸ The implementation of the Groundfish IFQ Program as a

⁷⁷ Aaron Loughton, Personal Interview, July 9, 2012.

⁷⁸ *Complaint for Declaratory and Injunctive Relief, PCFFA, POORT, SFCBOA Vs. Gary Locke, NMFS, NOAA*, 2010, <http://www.pcffa.org/CatchShareComplaint102210.pdf>.

component of the National Catch Share Policy exacerbated conflict between small-scale, community fisheries such as Port Orford and the PFMC, which appears to privilege the more industrial trawl fleet.

b. Defining and Forming a Community Fishing Association

In response to changing management regimes and threats to continued access posed by catch share allocation and TAC restrictions, POORT is galvanizing an effort among the fishing community to form a Community Fishing Association to overcome the access problems created by catch share management. Port Orford is taking the lead on defining a CFA in practice, and specifying the role of a CFA in managing local resources. The legal terms defined in the MSA are listed under the section describing Limited Access Privileges as “Fishing Community” and a “Regional Fishing Association.”⁷⁹ POORT has accepted the challenge to form a CFA to shape policy through action rather than waiting to accept some iteration of the policy handed down by fishery management councils. POORT is working with both the fishermen and the wider community to create a CFA. They hope that by creating a community entity with the authority to advocate for their fishery when future management decisions are made, they will protect the future of the local fishing industry. Port Orford’s CFA is made up of eight local fishers including some POORT board members and the mayor of the town. As outlined in Port Orford’s Community Sustainability Plan, a document required of legally defined “fishing communities,” the primary purpose of the CFA is to create a community-based regulatory entity that protects social equity, economic wellbeing and environmental wellbeing within a participatory framework. The CFA would allow the local industry to capitalize on the “synergistic opportunity...as [NOAA] begins

⁷⁹ MSA, Section 303a.

implementing its Catch Share Policy, meant to inform a newer and growing means of fisheries management that allocates...quota share...to individuals, cooperatives, communities, or other entities.”⁸⁰ The CFA would hold quota share, either as federal or state permits, to be leased at below market value to members to ensure that the rights to Port Orford’s traditional fish remain communal and local.

Although Port Orford has been excluded from some fishing resources by the transition to catch shares, the program presents a unique opportunity to incorporate new management models. Fisheries Policy Associate, Megan Mackey of Ecotrust, explains that catch shares are neither inherently positive nor negative; they are simply “a management tool.”⁸¹ How catch share programs are designed and implemented has the greatest significance for fishermen and communities. Ecotrust and the Island Institute have organized the Community Fisheries Network, a group of community-based fishing organizations from across the United States that have joined together to address common challenges, including how communities “that are the backbone of American fishing culture,” can participate and benefit under a catch share model of fisheries management. The solution to using catch shares as a tool to support local communities depends on the ability to form quota-holding CFAs that protect the rights of communities to access fisheries under the new management model. Leesa explains, “we are trying to have some way to hold quota, so we have to have a CFA...to be able to buy, sell, hold and lease quota.” CFA coordinator Kean has been actively triangulating between POORT, the fishermen and the new CFA board to define the quota bank portion of the CFA. Kean has looked to successful examples of community quota banks and allocation schemes such as the Cape Barnabas

⁸⁰ “Port Orford Community Sustainability Plan,” unpublished.

⁸¹ Megan Mackey, Personal Interview, June 26, 2012.

CQE program and the North Pacific Fisheries Trust in Alaska as well as the previously mentioned Cape Cod Fisheries Trust in defining Port Orford's model. The model has only been defined in draft form, but would require that entrants meet requirements defined in the CSP such as community residency, business operations such as coast guard inspection, tax compliance, insurance, portfolio of fisheries, a business plan, owner-operated boats that land the catch in the community for the past three years, compliance with federal, state and local environmental requirements, a fair share to a local crew and harvest using selective gear to minimize bycatch. If fishers meet the requirements defined by the CFA board, they become eligible to enter the quota leasing program.

At present, the CFA remains in process and has not yet become a fully functional body within the community and the fishing industry. Leesa Cobb explains, "we can't get over some of the hurdles right now, which are that you have to have a trawl permit." Port Orford would need a trawl permit in order to fish the groundfish that has been allocated to the trawl ITQ program. In the event that permits did go up for sale or transfer, it is unlikely that the CFA would be capable of purchasing a trawl permit, as they generally become prohibitively expensive for small fishermen and community organizations. Stephanie, an organizer of Port Orford Sustainable Seafood (POSS), hopes that profits from the CSF could help fund quota share purchases.

Other hope for obtaining quota lies in the 10 percent of the groundfish that has remained unallocated under the 2011 trawl ITQ program. This set-aside was intended as an adaptive management tool, with the PFMC noting the possibility that some of this 10 percent could go to CFAs. However, by allowing ongoing uncertainty for this allotment, there remains the risk that it will ultimately stay with the trawlers rather than being used

for program adaptations like CFAs.⁸² Organizations and fishermen have been frustrated by NMFS' unwillingness to comment definitively on the quota share that has been left as a "dangling amendment" to the FMP. In a recent meeting at the NMFS Northwest Regional Office, policy makers discussed the viability of Port Orford obtaining community quota. Kean explains that NMFS has unofficially decided to allocate these "adaptive management" quota pounds "to focus on new entrants and supporting local communities. But we are not a trawl community so we had to go and make our case to get quota pounds for the CFA." The Office was impressed by Port Orford's work implementing local science, but noncommittal. As Kean clarified, without any quota pounds, the CFA doesn't have anything behind it to encourage people to participate.

Another potential avenue for obtaining quota pounds would be through obtaining state permits. Again, Port Orford faces practical policy obstacles to holding community quota. Someone recently attempted to donate a state salmon permit to the CFA, but the policy of ODFW states that the "individual can hold fishing permits," and states nothing about communities. When Kean, the CFA coordinator, approached ODFW for clarification on how to transfer the salmon permit to their account, they responded by restating that the law requires individual boats and individual owners to hold quota. The CFA missed its first opportunity to obtain leasable permits. As Kean clearly states, "ODFW will have to change its rules in order for an organization like the Port Orford CFA to hold quota."⁸³ Though state level permits may be more accessible because they are more localized, less expensive and more available, the state policy lacks the provisions found within National Catch Share Policy that allow and encourage communities to hold quota.

⁸² Mackey, June 26.

Significant logistical barriers exist to the CFA obtaining the necessary quota to attract membership and initiate a functional quota lease program. The fisher's response to participating in the CFA is also a dynamic split between those who see the CFA as the future and those who are content to make the best of the existing situation. Local fishermen and POORT board member Lyle Keeler estimates that probably a third of the fishermen would initially seek to participate in the CFA. He explained that some of the younger guys would rather focus their efforts on fishing to make a living, "which I should be doing too, but this stuff is important." Kean has conducted extensive interviews and surveys with captains and crew, and explains that he has realized more and more that a lot of "the guys" are not engaged with policy, and that it is difficult to get people to care when there is no precedent, things haven't gone their way, and there are no incentives at this point. Some people would rather adjust to changes in regulation and access than do things preemptively. Kean explains further:

I think a lot of them are still confused about what it actually is, and even why its important...most of them realize that it is expensive to go fishing, and its hard for a young guy to get in there. Fishing is a real individualist industry, and so its tough to ask them to be a part of a fleet wide program, which is kind of...socialist, its community-managed access to fisheries, and like having criteria and forcing business plans on these guys who have always worked for themselves...its hard to get them on board with something like that.⁸⁴

Devising entry requirements and agreeing to the specifics of the quota lease program have also been complicated. Board members disagree about some of the requirements for participation, like whether or not new entrants must carry health insurance. Some argue that this creates a barrier for young crewmembers because it may be prohibitively expensive.

Forming a CFA is a relatively unprecedented model for managing fishery

⁸⁴ Kean Fleming, Personal Interview, July 10, 2012.

resources—federal and state policy have not been challenged to guide community co-management. POORT hopes to see a positive response develop towards new management models. In order for CFAs to succeed, fishermen too must adjust to a new understanding of management and greater cooperation, a major change for a group that historically guards its individualism. However, initial interest in the CFA is promising, as people seem to realize that something drastic must happen or Port Orford will lose access and thus lose its future. In an anonymous survey, all but two or three people out of 22 agreed that forming a cooperative to provide the fish for POSS would be positive, which could occur in conjunction with CFA membership. Fishermen guard their information carefully and retain a salty individualism, but as Lyle Keeler says, “I always figured there are no secrets out in the ocean anyway, some fishermen think that there are...it’s not that big an ocean.” Though organizing a fully functional CFA will be complicated, a strong groundwork has been laid by POORT and, if quota were obtained, there would be significant incentive for fishermen to participate.

Concern for the future of fishing runs through the entire discussion of conflict with management. Port Orford fishermen and POORT staff express great concern about the sustainability of the future for individual fishermen, the sustainability of the fishing community, and overall sustainability of the resource. Speaking with Leesa Cobb about the future, her commentary takes a personal turn. Her motivation for working for POORT and starting the CFA was personal, with policy “trending towards big boats and economic efficiency,” she could see her husband’s life as a fisherman “slipping away” and when confronted with the dilemma he said, “I have to fish, I was born to fish, its all I want to do.” Lyle echoed these concerns saying:

Well you know its so hard for the younger guys to get in...I hate to see the fishing go away, as it is now, and I think its going to, without organizations like ours it definitely would, It will all be big business pretty soon. My concern is that I won't be able to make a living pretty soon the way things are goin'...

The concern about future generations of fishermen having access to fisheries, particularly with the advent of catch shares program, was reiterated through conversation and writing. In preliminary results from demographic surveys of the local fleet, Kean reports that there are a significant percentage of people working in the fishing industry between their 20's and 30's and almost no one working in the industry between their 30's and 40's. The older age brackets are full, as they received fishing rights in initial allocations and have been "grandfathered in." In Port Orford, "things are not looking good for the future of career fishermen, because the young guys seem to be leaving." They have been "priced out" by the hundreds of thousands of dollars required to acquire a diversity of permits to make fishing financially viable. The lawsuit against NMFS claims that because the new quota system does not follow the owner operated model, "our next generation of fishing men and women will likely be seafaring sharecroppers forced to fish quotas held by processors, bankers and speculators." It is against this reality that Leesa Cobb and others are fighting, "if Port Orford wants to continue to fish," and remain a working town rather than a tourist town like the northern or southern neighbors, "then we need to have a strategy for fishermen to have the permits to fish here...we need to help these people coming up behind us. That's what the community fishing association is going to be about..." The future of individual fishing businesses in Port Orford is uncertain.

Kean Fleming connects this phenomenon of aging fishermen with concern for the future of the town. As aging fishermen sell their permits, they will go to places that have the capital to purchase them, "probably to a big town like Newport, all of these permits are

going to get consolidated onto fewer boats, fewer bigger boats and that's going to leave Port Orford out, which is kind of another coffin nail in this town." Without fishing, Port Orford could become a coastal ghost town, its population dwindling because the access rather than the resource itself has dried up.

Added to individual and community concerns, people are also concerned about the future of the fish stocks themselves under catch share. Leesa adds, "we are worried about serial depletion from the trawl IQ program because there are not [regional restrictions], that quota can be consolidated anywhere. So all the quota out of California can be fished out of Charleston Oregon, where we fish too." The impacts of serial depletion may not appear for many years. Considering the uncertainty for the future of individual fishermen, the town as a fishing community and the resource itself, forming a CFA to hold quota that addresses all three of these concerns becomes even more pressing. Leesa believes that forming a functioning CFA is a critical step in addressing these concerns, "I think it's the future. I sometimes wonder if that is what we should have started with 12 years ago, because that's really what we are moving towards." She explains that Port Orford is ideal place to experiment with this management model, "we fish in every fishery, all of us fish the same, they are all small boats, and if you are going to try community based fisheries management, you are certainly a leg up, if you start somewhere like this, and this is a unique situation." People around the country agree with her statement, Port Orford has been recognized nationally as a leader in developing a new paradigm of management and conservation that is localized, community-based and dynamic.

c. Sustainability in Practice

Though POORT has existed much longer than the effort to form a quota-holding CFA,

the effort to define this new model has increased the energy and the significance behind other projects. The fishing community and POORT are organizing the CFA project to keep the fishing industry alive, but being thorough and intentional in their attempts to create an exemplary fishery to sustain, rather than a local industry that depletes the resource.

i. Place-based Conservation

Port Orford has a history of proactive community initiatives. Before creating the CFA and the Community Sustainability Plan, Port Orford self-declared a Community Stewardship Area in 2006, comprised of traditional fishing grounds and the land that extends inland, including primary watersheds. Though extending the stewardship area to include the land created more potential for conflict, local fishermen Lyle cites the importance of this measure, “What we put into the ocean, it comes off the land, we really don’t have a problem here, but we want to keep it that way.” Establishing the Stewardship Area was a difficult negotiation within the community as well as a source of tension with neighbors. Fishers in the Port Orford community and in the surrounding communities were worried about access to the resource. In designating this area, POORT hoped that other coastal communities would follow suit, promoting a string of locally managed stewardship areas up and down the Oregon Coast. They included the watershed to acknowledge the importance of the land-sea connection, and are working with ranchers and farmers to maintain the overall quality of Port Orford’s environment. Leesa explains the ocean-side effort, “we tried to make our whole stewardship area a trawl exclusion zone.” POORT included this request in the marine reserve process to the Ocean Policy Advisory Council, essentially proposing to make the Stewardship Area a marine protected area with trawl exclusion, but their request was denied. However, it did show people “that

we weren't afraid to stand up there and say what we think...there were trawlers on the panel... they knew that Port Orford didn't like trawling because we are hook and line, and because of how much damage it has done here."

Within the Community Stewardship Area, the town responded to Oregon's initiative to designate marine protected areas, delineating the Redfish Rocks Marine Reserve and declaring it a "no take" zone to protect the most productive reef and ensure the long-term sustainability of local stocks. This effort is unique in that Port Orford was the first fishing community in Oregon to step up and volunteer one of their most productive reef areas as a marine reserve closed to fishing. The community understood that while the loss of this piece of fishing ground could hurt fishermen's bottom line in the short-term, safeguarding an ecological hotspot will help to make local and regional fisheries more productive in the long-term.⁸⁵ Though Port Orford fishing community has disagreed with the coast wide management structure and the way these policies are implemented locally, the community, with the guidance of POORT, is actively broadening definitions of local stewardship and putting conservation goals into action.

ii. Local Research Partnerships

The Redfish Rocks Marine Reserve not only provides a local conservation area to protect the recruitment and development of local stocks, but also attracts scientists to collaborate with fishermen on localized research projects. A primary criticism of coast wide, top-down management is that the complex and expensive stock assessment processes are not tailored to local variability.⁸⁶ Nor could they be, given the high cost of

⁸⁵ Mackey, June 26.

⁸⁶ Kevin St. Martin, "Making Space for Community Resource Management in Fisheries," *Annals of the Association of American Geographers* 91, no. 1, (2001): 122–142.

conducting this research, even at the present scale. Thus, fine-scale data collection in collaboration with the hundreds of years of collective local ecological knowledge that the fishermen provide creates an ideal venue for accurate research. The Redfish Rocks Marine Reserve is an important component of the vision that POORT has for the future of local science in Port Orford. The reserve was created using collaboration between fishermen and scientists to select an area that includes sandy habitat, rocky reef, bull kelp and gravel identified using the knowledge of local fishermen with input from scientists. The variety of this small area provides critical habitat for local fish stocks.

In conjunction with POORT and Oregon State University, fisheries scientist Tom Calvanese is working on a fish-tagging and tracking project with local fishermen to learn more about fish movement and to be able to determine if rockfish and other species are staying within the reserve to an extent that demonstrates the effectiveness of spatial conservation efforts. If not, his research may indicate that other conservation methods would be more efficient by impacting fishing less and still achieving conservation goals. In theory, a significant body of localized data could be used in conjunction with federal and state stock assessments to fine-tune and localize catch limits, gear restrictions and other regulations. The research has been truly collaborative between the scientists and fishermen. Lyle and other fishermen have helped Tom place the sensors and catch the fish for tagging. To Lyle, the local science projects are a boon for the community and the industry. Alluding to his concerns about the mismanagement of yelloweye rockfish, he comments, "That's why I wanted the reserve, the MPA...because I know how many yelloweyes are in there, and if we could just prove it...that's exactly why I was happy to see

[Tom] come in...I've been fighting for tagging since the start of this association." Tom's research could reveal important information about the behavior of valuable, long-lived species classified as overfished, like yelloweye rockfish. Port Orford plans to continue to build collaborative research partnerships between scientists and local fishermen, including plans to construct a marine science center with publicly viewable research laboratories. The Redfish Rocks Marine Reserve has taken on larger social importance than the economic, ecological and scientific benefits it represents. The community has great ownership over reserve because community members, using interviews, mapping workshops and prolonged discussion, designated the area themselves. The reserve, future plans for collaboration and in house science create a local conservation ethic central to the identity of the fishers and other community members in Port Orford.

iii. Redefining "Sustainable Seafood"

POORT's long-term involvement with a highly organized local fishing community has generated a business model that appeals to consumers through a sustainability narrative. The organization recently launched Port Orford Sustainable Seafood (POSS), selling the local catch at regional farmer's markets, and more recently adopting the Community Supported Fishery (CSF) model. CSFs have been cropping up around the country in places with strong small-scale fishing culture and industry. The model is directly patterned off of the successful Community Supported Agriculture (CSA) model, where people subscribe to a weekly or monthly share of whatever the local farms are producing. Under the CSF model, people subscribe to an amount of the local catch. Because fish are often more difficult for consumers to prepare, the subscription comes with suggestions for recipes and preparation techniques to build a consumer base that is not

only educated about the local fishery, but also comfortable and confident in preparing fish for consumption.

Port Orford fisherman Aaron Longton is working with Americorps staff member Stephanie Webb to further develop the CSF. They recruited 19 local shareholders at \$600 per year or \$150 per quarter during the first year of the program, and found that their subscribers were becoming increasingly involved in local fishing issues. Confirming the rise of CSFs nationwide, The New York Times recently featured CSFs in an article entitled, “For Local Fisheries, a Line of Hope.” The article quotes the “Lobsterman” Ted Ames, “Not only do C.S.F.s give people the freshest seafood,” he says, “they give local fishermen a chance to be stewards of the resource.”⁸⁷ Consumer demand for “sustainable” and chain of custody certified seafood has increased in conjunction with greater attention to local and natural food systems. CSF’s provide the opportunity for fishermen and consumers to localize the fishing industry. With reports of “global overfishing,” consumers now want certified sustainable seafood to feel assured that they are not perpetuating overfishing. As a small-scale, artisanal fishery, Port Orford is a natural candidate for building a narrative of sustainability. CSF organizer Aaron Longton spoke about the goals and success of the CSF:

...a lot of it has to do with how we fish here, because we are all hook and line fishermen. So our discards are very small. And plus we have a verifiable record of engaging in conservation. We designated the marine reserve, and having stewardship plan, and developing a stewardship area—quite a unique situation. As far as the sustainable part, we don’t have any certification, MSC [certifies] fisheries, not communities and you gotta have a lot of loot....There are a lot of questionable fisheries that are running around with the green stamp. So we are self-proclaimed...We are willing to have that argument with anybody. We had to be Port Orford Some Kind of Seafood....We always knew we had a superior product and that there was demand for it...it’s all mystery fish out there. So that’s one way, you can have a conservation story and a conservation ethic that you tag onto that, and also the

⁸⁷ Patricia Leigh Brown, “For Local Fisheries, a Line of Hope,” *The New York Times*, Port Clyde, Me., October 1, 2012. http://www.nytimes.com/2012/10/03/dining/a-growing-movement-for-community-supported-fisheries.html?pagewanted=all&_r=0.

traceability, you build relationships with people and get a connectivity, so we had to take advantage of that, and we thought of it as kind of a way to affect local prices...

By developing a direct market based on consumer confidence in the sustainability of the product and the practices through POSS, fishermen can capitalize on the fact that they participate in a sustainable model of commercial fishing. The CSF builds more than just a market for sustainably caught seafood. It serves as another tool to organize community activism. Aaron expands upon his experiences with subscribers while organizing the CSF, “So it isn’t all about just some guy offering you a gritty handful of money for your fish and not knowing where it went, you actually have a relationship with the other side... it’s a sense of community throughout the whole system.” POSS represents another avenue for sustaining the local fishery of Port Orford.

iv. Improving fishing practices

In order to support the narratives of sustainability central to both building POSS and the CFA, Port Orford fishermen have committed to clean fishing practices. By nature of using fixed gear—pots, traps and hook and line—rather than trawling, Port Orford fishermen are selective in the species they catch and incur less incidental damage to ocean floor habitat. However, non-target species and protected species are still caught by fishermen and thrown back because there is no market, or because they are illegal to catch and retain. To further improve upon the issue of bycatch, POORT is working with a fishery consultant to develop methods of bycatch reduction, beginning with an assessment of what comprises the primary bycatch and how to mitigate incidence. This provides a concrete example that the organization can point to when advocating for quota allocation based on sustainable fishing practices. POSS also targets the bycatch issue from the consumer angle, working with a chef to devise new techniques to prepare species fishermen catch

frequently but are not traditionally commercially important. The fishing community of Port Orford defines itself in opposition to the status quo of industrial and exploitive fishing by emphasizing the ecological benefits afforded by extracting fish using a small-boat, and fixed-gear artisanal techniques, adding credence to the CFA and the marketing of their product under POSS. The fishing industry in Port Orford is moving away from the mentality of “just trying to squeeze a few more bucks out of the ocean” that Lyle claims has been a past problem. By choosing to emphasize sustainability to protect the longevity of fishing, local fishing practices will become increasingly clean because of accountability to the community, the leadership and the consumer base.

d. The Future for Port Orford

The opportunities created by the CFA model that Port Orford is pursuing are undeniable. POORT’s efforts demonstrate the beginnings of an integrated model demonstrating community co-management in practice. “Community management” and “local management” are much discussed in policy by conservation groups and commercial fishing organizations, but have not been implemented over the long term in conjunction with modern industrial fishing on the West Coast to indicate whether these models can, with the oversight of the councils and federal or state regulators, be successful at conserving resources and creating socially and economically sustainable fishing communities. There are several obstacles that Port Orford must overcome before becoming a successful CFA entity that has membership and leverage. If the organization overcomes these obstacles, the result will be a fascinating experimental foray into community-based natural resource management. Assuming that policy adapts to make space for the community organizations and fishers to achieve their goals, Port Orford could become the

template for communities around the country to work in conjunction with existing management structures to holistically improve sustainability of the fishing industry. Though there can be no control for this social, biological and economic experiment in sustainable management, and results will take years to become clear, there are immediate and obvious benefits accrued in pursuing a diverse, inclusive and localized answer to the question of natural resource management.

Unfortunately, the work being done on the local level in Port Orford is at risk for becoming merely a footnote in articles about innovative fisheries management. The harbor itself where the fishermen launch everyday is in desperate need of dredging; it is only a foot deep in some places. Despite an aggressive local campaign this summer and the efforts of Congressman DeFazio to encourage the Army Corps of Engineers to add Port Orford to a preexisting dredging project, the harbor did not get dredged. POORT reports that the Corps came to the town for a meeting, and made it clear that Port Orford is a low priority. The depth of the harbor poses a major safety risk and prevents fishermen from going out fishing some days. Some fishermen are discussing a desperate makeshift dredging attempt by tying boats together and digging out the sediment with their props. The dredging issue is yet another obstacle with which the community must contend to remain a vital fishing town. Their struggle has become symbolic of the obstacles of many small towns threatened by consolidation, inhospitable policy and lack of necessary support. Leesa Cobb fully recognizes the challenge her community faces, “to stay in fishing, people really recognize that there are going to be fewer active fishing ports. Do you want it to be your port or not? And what are you going to do about it?”

II. Sitka, Alaska

Accessible only by air and by sea, Sitka sits on the picturesque, glacier-carved coast of Baranof Island and is one of 195 fishing communities in Alaska recognized and profiled by NMFS. Originally inhabited by the Sitka Tlingit, conflict between the native people and Russian traders persisted until 1804 when the Russians destroyed the Tlingit Fort. Located on the Pacific Ocean, Sitka became the capital of Russian Alaska and an export hub primarily for furs, but also for salmon, lumber and ice. The population of Sitka in 2010 was 8,881, comparable to the population of the town in 2000 despite a slight trend of population decline during these years. Though agriculture, forestry, fishing, hunting and mining are reported to employ 5.9 percent, this number is not representative as many fishermen hold two jobs and identify as their other occupation. The Community Profile of Sitka updated in 2011 by social science researchers at the Alaska Fisheries Science Center reports that community leaders specify that Sitka's economy depends on natural resource-based industries. Furthermore, fish processing provides significant employment, though it is seasonal.⁸⁸ In contrast with the reported statistics, the Sitka Economic Development Association estimates that 19 percent of the workforce works in the seafood industry in some capacity, belying the true importance of the industry to the community.⁸⁹ Sitka currently ranks 14th nationally (6th in Alaska) in overall catch poundage and 10th nationally (5th in Alaska) in ex-vessel value of the catch, demonstrating the economic importance of the port on a national scale.⁹⁰

A complex arrangement of state, federal and international law regulate the fisheries

⁸⁸ A.C. Himes-Cornell, et al., "Improving community profiles for the North Pacific fisheries," *U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-230*, (2011), 85 p.

⁸⁹ "Sitka Seafood," *Sitka Economic Development Association*, n.d. <http://www.sitka.net/sitka/Seafood/Seafood.html>.

⁹⁰ "US Commercial Landings 2011," 2011, <http://www.st.nmfs.noaa.gov/commercial-fisheries/fus/fus11/index>.

off the coast of Sitka. Sitka fishers fish salmon regulated under the Pacific Salmon Treaty with Canada, and some halibut stocks are regulated by the International Pacific Halibut Commission. Bait herring, herring roe, pacific cod, lingcod, sablefish, crab species and dive fisheries are all regulated by the Alaska Department of Fish and Game (ADF&G). Some halibut shares and sablefish are fished under federal permits, others under quota shares. Salmon were the highest volume species in 2010 with 49,816,762 pounds valued at \$37,560,868. Net ex-vessel value for fisheries landed in Sitka was \$74,800,109 in 2010. In 2010, 750 residents held 1,323 permits issued by the Commercial Fisheries Entry Commission, the state permitting agency. This number represented a decrease in the number of permits held and an increase in the number of permit holders from 2000. The number of License Limitation Program (LLP) groundfish permits, issued to individuals, decreased marginally to 200, and the number of permit holders decreased slightly as well to 183. The number of Federal Fishery Permits (FFP) and the number of permitted vessels both increased from 157 to 166 and 153 to 157 respectively. The number of vessels owned by Sitka residents and number of vessels home-ported in Sitka decreased, while the number of vessels landing catch in the community, the total pounds, and the ex-vessel value increased from 2000 to 2009. For IFQ halibut in Sitka, the number of individuals holding halibut quota share decreased while number of shares remained stable. The number of quota shares decreased while the number of shareholders increased for sablefish, however the actual IFQ pounds allotted for both species have diminished in recent years.⁹¹

⁹¹ Himes-Cornell, "Community Profiles."

Based in Sitka, the Alaska Longline Fishermen's Association (ALFA) serves as the voice and representation for the local longline fishing community since its founding in 1978. A non-profit comprised of independent commercial longline vessel owners and crewmembers, the organization's original purpose was to eliminate destructive foreign fishing on sablefish and rockfish stocks. The organization has since worked to eliminate trawling, advise the Individual Quota system, and advocate for longliner's access to halibut quota. The organization is currently working with select fishermen on sustainability initiatives. ALFA is "committed to continuing the sustainable harvest of sablefish, halibut, and groundfish, while supporting healthy marine ecosystems and strong coastal communities through resource stewardship and participation in federal, state, and local forums." Linda Behnken, a longtime commercial longliner, is the current director of ALFA. Like in Port Orford, I approached the issues and questions faced by the fishing community in Sitka from the perspective of ALFA, as the organization has a long history of working on fisheries management from the local level.⁹²

a. Management and Industry Context

Though Sitka and Port Orford currently seek to redefine the standard practices fisheries management so that communities can benefit from policy support while safeguarding resources, the motivations behind the organizations' efforts possess a different tenor. In Port Orford, the effort to form a CFA by POORT and the local fishing community arise out of a passionate desperation to save a small port and a small town. In comparison, Sitka has a thriving commercial fishing industry. Alaskan fisheries are internationally recognized as some of the best-managed fisheries in the world. The fishing

⁹² "Alaska Longline Fishermen's Association", n.d. <http://www.alfafish.org/>.

industry represents a major portion of statewide employment and exports. Alaska's Resource Development Council estimates that the fishing industry provides 54,000 jobs statewide, with fish harvesting and processing representing as much as 50 percent of private sector employment opportunities in coastal areas.⁹³ In Sitka, the industry is relatively healthy. While some permits have declined and revenues from some species such as halibut have been significantly diminished by lower catch limits, the town's fishing revenue has steadily increased from 2000 to 2010. In contrast to Sitka, an economic analyst with NOAA's Restricted Access Management (RAM) division explains that after the implementation of the controversial IFQ program in 1995, many smaller Southeast Alaska communities experienced consolidation and out-migration of fishing quota. Sitka fared better than many other communities under the new management.

In evaluating the effort to include fishing communities in management decisions, it is important to note the distinction between the history of community provisions enacted by the North Pacific Fishery Management Council (NPFMC) versus the lack of community provisions implemented by the PPMC. Due to isolation, lack of infrastructure and lack of other economic opportunities, remote coastal Alaskan communities fundamentally depend on fishing, while communities along the West Coast of the contiguous U.S. are less dependent because of more diversified economies and better access. Recognizing the centrality of fishing to employment and income in isolated communities, the NPFMC has, in many cases across the state, enacted community provisions either in response to or in anticipation of hardships incurred by management changes. In some cases, communities demanded the implementation of these programs; profits from industrial fisheries were

⁹³ "Alaska's Fishing Industry," *Resource Development Council for Alaska, Inc.*, n.d.
<http://www.akrdc.org/issues/fisheries/overview.html#Anchor-Background-49575>.

going straight to Seattle where many companies are headquartered.⁹⁴ The programs enacted by NMFS and the Council function in conjunction with catch share and limited access management directives. Primary examples include the Community Development Quota (CDQ) Program and the Community Quota Entity (CQE) Program. The CDQ Program was implemented in 1992 and targeted small, rural, underdeveloped, fishing dependent and predominately native villages in the Bering Sea and Aleutian Islands (BSAI) management area. Refined and codified by the MSA re-authorization of 2007, CDQs were designed:

- (i) to provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the Bering Sea and Aleutian Islands (BSAI) Management Area;
- (ii) to support economic development in western Alaska;
- (iii) to alleviate poverty and provide economic and social benefits for residents of western Alaska;
- (iv) to achieve sustainable and diversified local economies in western Alaska.⁹⁵

To accomplish these goals, CDQ entities representing 65 western Alaska communities were granted allocations amounting to about 10 percent of BSAI quota for groundfish, crab, halibut and common bycatch species. NMFS requires profits from harvest of CDQ quota pounds to be invested in further developing the fishing industry in these communities. The CDQ program has been successful in organizing communities to capitalize on resources granted to them to promote community development.⁹⁶

Though similar in intent and design, the CQE Program functions differently from the CDQ Program and has seen less success. When halibut and sablefish switched to IFQ in 1995, no provisions were made for small communities, and these communities reported

⁹⁴ Hollowed, July 19.

⁹⁵ MSA Sec 303 i1A.

⁹⁶ NMFS, "Western Alaska Community Development Quota (CDQ) Program", November 2009. http://www.nmfs.noaa.gov/sfa/domes_fish/catchshare/docs/alaska_cdq.pdf.

rapid migrations of quota, and people out of communities. In 2004, after much petitioning from community groups, the PFMC signed the CQE Program into law, allowing small (less than 1500 people) communities in the Gulf of Alaska (GOA) to purchase quota to be held by the community and leased by community members. GOA communities are generally less isolated and more developed than their BSAI counterparts, and exist in a more politically complex socio-economic milieu. Thus, initial allocation of quota without purchase was not seen as a pragmatic option for small GOA communities.⁹⁷ CQE eligible communities must form a non-profit and obtain sufficient capital to purchase quota shares of halibut and sablefish. However, halibut quota share increased from around \$8 per pound in 2000 up to as high as \$30 per pound in 2009, making quota share prohibitively expensive. Only one of forty-two eligible communities has managed to organize and purchase quota. Though not all attempts have been successful, the NPFMC has demonstrated a willingness to consider the social sustainability of fishing communities in its policies.⁹⁸ A NMFS official affirms, “At least in the North Pacific, I know that the council really does get a lot of input from industry.... I think it really does try to tailor the management programs based on what industry tells them, how they operate, and what they would need.” It is a constant negotiation and renegotiation to establish policies that meet the needs of a diverse body of stakeholders.

Sitka, a fishing town of over 8,000 residents located in the GOA region, is not eligible for participation in the CQE program, and subsequently has no pre-designated community

⁹⁷ Ram Staff, Personal Interview, July 31, 2012.

⁹⁸ “Community Quota Entities Workshop Proceedings,” Alaska Sea Grant College Program, February 17, 2009, http://www.nmfs.noaa.gov/sfa/domes_fish/catchshare/docs/alaska_cdq.pdf.

framework within which the fishing community can operate. However, ALFA has established the town as a leader in developing community co-management, and as a leader in the newly formed Community Fisheries Network (CFN). ALFA director Linda Behnken has enjoyed sharing ALFA experience with fledgling organizations and learning from the experience of groups like Cape Cod, “it’s a lot of learning, and sharing, and I think just knowing that there are all of these other groups out there that care about the same things, that believe that there is a future for community-based fisheries.” In 2005, Sitka held a workshop, facilitated by Ecotrust, of fishermen and community leaders on the topic of Community-Based Fisheries Management. The workshop produced the “Sitka Declaration” and ultimately resulted in the founding of the CFN. The declaration advocates for a community approach to management to work first for sustainability of marine resources and second for access to fisheries resources:

Coastal fishing communities are in trouble. The sense of place and the traditional connection of community residents to marine resources are vanishing. Current management systems are undermining the ecological, social and economic basis of community sustainability. In many cases this has contributed to the exhaustion of resources, decreased biological diversity, and the loss of a way of life that forms the basis of much of our region's history and culture. Increased absentee ownership and capital costs deny the traditional entry of future generations from coastal communities. The community's knowledge of, economic dependence upon, and attachment to fisheries resources is essential to promoting a strong sense of stewardship. There is a national and an international interest in maintaining healthy, dynamic and diverse coastal communities.⁹⁹

Despite the fact that Sitka does not fit the profile of a CDQ or CQE community, the vision of ALFA and the fishers represented by the association is to maintain a localized, community-based fishery that pursues a triple-bottom line of ecological, economic and social sustainability.

i. Preserving a Community-Based Fishery in Sitka

⁹⁹ “Sitka Declaration”, March 16, 2005, http://www.ecotrust.org/cbfm/Sitka_Declaration_2005.pdf.

The management goals and conflicts addressed by ALFA are not focused on preserving the very existence of their fishery, but rather aimed at the identity of the fishery as local, owner-operated, tied to the community, independent and viable. Though Alaska possesses a rich history and an abundance of contemporary examples of small-scale subsistence fishing, the large-scale and industrial commercial ocean fisheries represent a dominant image of the Alaska industry. AFSC scientist Anne Hollowed explains, “We don’t have the smaller-scale interactions as much as they do in the lower forty-eight. Smaller artisanal sort of fisheries exist up there, their fraction of quotas are smaller...That being said, there has been a recognition of the importance of communities within Alaska to have some stake in what’s happening.” Many Alaska fishing companies are actually multinational conglomerates or have corporate headquarters out of the state. Many fleets are highly capitalized, large-boat and high-volume fleets designed around economically efficiency.¹⁰⁰ For example, the rationalized BSAI crab fishery is completely industrial; a Sitka fisherman differentiates that fishery from the Sitka community-based model, “its more of an industrial fishery, there is a community purchase option, but nobody has even asked us to be eligible to do that...it is what it is, its corporate.”¹⁰¹ Despite the apparent dominance of the industrial model in Alaska fisheries, fishing in Southeast Alaska differs from the industrial fleets. NMFS staff explain that before the halibut and sablefish IFQ program was implemented, “We had more than 750 or 800 boats in Southeast, very small—even out West in Western Alaska they were fishing halibut out of open twelve foot skiffs.”¹⁰² Though it is a high volume and high value port, the Sitka fleet values the small

¹⁰⁰ Fina, 164-176.

¹⁰¹ Sitka Fisherman

¹⁰² NMFS Staff.

boat, community-based model, which requires different management directives and intentional safeguards to protect the independence of the fleet within a backdrop of corporate industrial fishing.

In the process of fighting to preserve the vision of a community-based, independent, local fishery, ALFA defines its organization in opposition to a corporatization of the fishing industry. Sitting on the edge of the dock in one of Sitka's commercial harbors, I spoke with director Linda Behnken about ALFA's role in the community fisheries movement, "ALFA has always been a group that has been really concerned about independent fishermen and coastal communities...we have these concerns about independent fishermen staying viable and having access to the resource, and even though we were winning some of the battles, we were worried about losing the war...."¹⁰³ Taking action for the future of independent fishermen, ALFA has continued to advocate in policy realms while pursuing innovative partnerships to create financial options for community fisheries. Behnken explains that the NPFMC's receptivity to community objectives has fluctuated over the years between outright support and disinterest. Natalie Sattler verifies Linda's long-term advocacy in policy and management, explaining that these efforts are ongoing for the organization as management is always fluctuating and changing. Individual fishermen have been working to maintain a sustainable resource for years, though ALFA's involvement has brought about some new developments. These include organizing fishermen to assist with data collection, recruiting fishing vessels to voluntarily contributing time and resources while out fishing, and gathering formalized support for the Fishery Conservation Network and CSF Alaskan's

¹⁰³ Linda Behnken, Personal Interview, July 25, 2012.

Own.¹⁰⁴ ALFA member Jeff establishes his position, “for me it’s a no brainer,” taking care of the resource comes first, and then the people—the communities and the fishermen. He acknowledges that some do not share his vision, opposing limits and conservation measures because of a desire to “make things corporate.” Behnken cites a specific period of halibut management as an example of a time when industry pressure took advantage of policy with adverse environmental impacts, “Management didn’t respond quickly enough to lower quotas when fishermen started seeing the sizes go down. Many fishermen said ‘we need to reduce,’ yet management left the quotas too high.” The political nature of policy-making at times jeopardizes the integrity of the process of stakeholder input.

Sitka longliners fish halibut and sablefish quota under the halibut and sablefish IFQ program administered by NMFS since 1995. The program, while successful in some of its goals, has been fraught with back and forth negotiations to fine-tune it so that fishing communities are not adversely affected. The RAM division of NMFS’ Alaska Regional Office in Juneau administers the program as one of many North Pacific catch share programs. According to RAM staff, “the [IFQ] program was originally designed to keep the halibut fishery, the way it had always been, which, especially in the Gulf communities in the Southeast, was owner on board, small fleet.” In the aftermath of the program’s implementation, many communities have seen dramatic shifts in quota distribution, consolidating the resource as permits migrate out of smaller, often native communities. RAM staff clarify that the initial iteration of the program had no specific community provisions; the consequences for communities were not “totally unanticipated, I think there was an understanding that this kind of thing happens.” Managers underestimated

¹⁰⁴ Natalie Sattler, Personal Interview, July 24, 2012.

how quickly people would sell quota and alter the makeup of fishing communities; these shifts were compounded by other factors like plunging salmon prices and general hardships which had already set in motion a migration of people out of rural communities. The dramatic interaction between these factors was unanticipated. Though IFQ is criticized, a regulatory change was inevitable. NMFS catch share program supervisor identifies dangerous “race for fish” conditions and “overcapitalization” as primary motivators for switching to the IFQ share-based program. She explains the conflicts inherent in implementing these types of policies:

I would say, by and large, the council has always been very specific about its objectives for catch share programs. And overall, those usually have been achieved by implementation of the program. Now, I think that there are always unintended consequences when you implement big management changes like this, and I think that what I would identify as probably the largest concern that people have is some of the economic distributional affects, winners and losers if you will, when you start allocating fisheries quota, and then some of the community affects that result from implementation of these programs.¹⁰⁵

Achieving a balanced outcome in systems with varied stakeholder groups is difficult even with the best-intentioned policies.

Though Sitka is generally considered to be one of the “winning” communities following the transition to IFQ management, Behnken and other ALFA members are not fully content with the implementation and allocation processes and what they signify for the future of fishing in the Southeast region. Alluding to the politicization and corporate dominance present in the system, she elaborates, “there has been a big push always to make the IFQ program work better for people who already have a lot of quota, which makes it harder and harder for people to buy in.” One of the major arguments in favor of catch share is that the program rewards efficiency.¹⁰⁶ “There is this economist’s fallacy that

¹⁰⁵ NMFS Catch Share Supervisor.

¹⁰⁶ “NOAA Catch Share Policy.”

the people who win under the catch share system are the most efficient people. That's totally false, the quota ends up in the hands of people who have access to capital or an initial allocation. It's a major advantage." Future access to fisheries is a major concern for ALFA. Their ongoing focus is to work to keep the quota in Sitka as older fishermen who received initial allocations age out of the fishery. Without support, new entrants will not take over from the previous generation, leaving the door open to corporate control. ALFA's vision of sustaining an independent fishing fleet goes beyond the effort to prevent corporations from capitalizing on the catch share program and buying expensive quota-share out of communities like Sitka as fishermen age out. Behnken elaborates on ALFA's relationship with IFQ, "we think catch share systems make sense but we want to make programs or program changes that are designed to sustain small, community-based fishing operations, that community-based fishermen are still [independent], and that managers don't reduce the fleet to levels that cannot sustain healthy coastal communities." Though most agree that IFQ was necessary to address some of the problems in the fishery and has potential to work for small CDQ and CQE communities as well as places like Sitka, communities must actively work to avoid consolidation and corporatization of the fishery under this program.

Behnken extends her vision a step further, "But then the other piece of it, the piece I really want to see, is a coordination of efforts with marketing fish...between communities that pushes back against corporate control of the food system, whether the issues is corporations controlling food distribution or controlling prices." In setting themselves in opposition to corporate quota buyouts, Sitka fishers, lead by ALFA, represent the importance and power of independent, community-based fisheries. The future of

independent fisheries looks brighter here than in Port Orford, young people are still entering the fishery, and the “grandfathers” are working to maintain healthy, accessible stocks.

b. Organizing as a Fishing Community

Though ALFA has been successful in advocating for the interests of the fishing community, the organization represents only one element of a comprehensive effort to define a community-based fishery. Though Sitka did not receive an official benediction of being a “fishing community” supported by federal management policy CDQ and CQE communities, a vocal percentage of the fishing community wants to continue to function just as that—a fishing community with organizational structures that preserve this identity. In many places, after the transition to IFQ without community protection measures, people, fishing quota, and processing capability move away. As a regional fishing hub and a community with more diverse appeal, there is now more quota in Petersburg and Sitka than there was before the program.¹⁰⁷ Sitka does not find itself desperately attempting to preserve the local economy, but ALFA members feel strongly about creating structures to preserve the community-basis of the fishery. Linda Behnken explains the motivation, “[We] came up with this idea of starting a fishery trust in order to really push back against corporate control of the fishery. We recognized that we needed an entity that could aggregate the influence of community-based fishermen and thereby earn an effective seat at the management table. The Trust would have real investment in the fisheries and help community-based fishermen stay viable in the fishery.” In its inception, the Trust had three components: conservation, marketing and quota share financing. ALFA

¹⁰⁷ RAM Staff, July 31.

agreed to take on the conservation aspect through clean fishing standards, gear experiments and conservation projects. ALFA, through the CSF Alaskan's Own, would pursue direct-marketing of seafood, and the North Pacific Trust, an ALFA partner and Ecotrust subsidiary, would take on the financing component. Unfortunately, start up financing for the Trust through Ford Foundation PRIs fell through, but project partners have regrouped and are pursuing equity capital from other sources. Financing quota is critical to the goals of ALFA and their concerns for the future. Older fishermen who were granted quota-share allocations dominate the Sitka fleet. Local fishers fear that as these participants age out, quota share will be too expensive for new entrants to purchase, and the community-based, locally focused ethos of Sitka's fishers will disappear in a generation. With the Alaska Sustainable Fisheries Trust, Behnken and ALFA hope to prevent that trend. What happened for CQE communities serves as a warning. RAM staff explains, "halibut and sablefish quota share is very expensive...it is hard for individuals [to purchase], and therefore community quota entities with little collateral to purchase quota share" are unfortunately excluded. Given the market forces at work, some sort of platform for community-controlled quota is vitally important.

Two primary methods exist for financing quota share. Behnken and ALFA envision a different model than that of a community organization that holds quota, similar to the CQEs, which is what Port Orford hopes to create. She explains, "The idea with the AFST is that with the quota share lending program, you set it up to have money generated through the lending [which] supports the program, and the marketing supports the conservation piece." Quota-share financing would provide fishermen with small loans that they could use to finance purchasing quota to help them gain access to the fishery. She explains that

working to purchase quota directly is less of a focus. In part, this is due to the program's structure, "The way the IFQ program is written, most of the shares, except for a very small percentage, 'A' shares, can only be owned by individuals." "A" shares are, according to Behnken, available for purchase by communities. Even if the council better facilitated this avenue, purchasing quota would cause the organization to be directly competing with independent fishers for quota, and ALFA has always been about the viability of independent fishers. Behnken clarifies:

The Trust will finance people to buy shares, sharing the risks of quota and stock fluctuations. Financed fishermen will participate in research and conservation programs of the Trust, hire local crew and live in coastal communities. Fishing shares financed by the Trust will...help them generate the necessary cash flow to build their business. The downside of our approach is that once the people pay off their shares, they can move to Hawaii if they want, so you can't make sure that the shares stay in the community. But our objective has always been to support independent fishermen. If the Trust buys shares, we would be competing against independent fishermen, which would contradict our goal. So our focus is supporting intergenerational transfer of shares to keep the access to local fisheries in the hands of independent, community-based fishermen.

However, when asked about holding quota directly, she clarifies that the Trust might do so in a small way if the opportunity presented itself, "If the Trust has chance to buy some 'A' shares, then likely we would, but with the goal of allowing Trust-financed fishermen to harvest the shares as they are buying their way in on their own shares." Both buying and financing shares is a challenge at this point. Few shares are on the market and the prices have increased five-fold. "If we could have started the trust ten years ago or fifteen years ago when the program was first put in place, quota sold then for \$5 per pound or \$10 per pound, where now it is \$35-\$45 per pound. So it's just getting really hard." With purchase of 'A' shares currently out of the question and funding for the loan program tenuous, ALFA and the Trust have work to do in order to be able to financially support the future of Sitka's community-based fishery.

The obstacles Sitka faces to defining its own version of a functional CFA reflect systemic obstacles within a management structure that privileges individual access rights. The community provisions the Council has implemented focus on smaller communities, that they considered disadvantaged. This focus has introduced a new source of conflict; communities who received initial allocations are not necessarily in support of more community quota becoming available, as they do not want their privileges diluted. Furthermore, individual fishermen are opposed to community quota allocations, as the quota has to come out of the capped total and they worry about the security of their shares. RAM staff provides insight into Council processes, “every little thing that the communities come forward with is a battle now.” Another fisheries policy maker remarks, “you have to approach the council in a sideways, crab manner and sidle up to it, not request things, you have to be sensitive to the political situation,” referencing a community who asked for CDQ quota outright and was denied.¹⁰⁸ Financing is the primary obstacle for either self-defined fishing communities like Sitka or NPFMC designated communities to develop an accessible and widespread community quota regime using loan programs or direct purchase. Grants and financial support from organization like Ecotrust have traditionally been the most accessible option for communities seeking to finance community-fishing endeavors. However, the Council is starting to get more creative with options. A NMFS economist indicates a new effort on the Council’s part to encourage quota purchase in CQE communities, allowing communities to apply for lucrative charter halibut permits and use those profits to bootstrap into IFQ quota share. The program is too young to determine its success, and is probably not open to a community like Sitka. However, the charter halibut

¹⁰⁸ Pers. Comm.

business is large in Sitka and could be used as a financing asset. External obstacles to community fishing organizations abound, compounded by the internal, organizational conflicts within the fishing community. Linda Behnken estimates, “with ALFA, you only get about 10 percent of the quota shareholders who are willing to join an organization and put any money in so financially, its difficult.” If the Trust became quota-holding entity or offered financial assistance to local fishermen committed to the community-based and sustainable fishing ethos of Sitka, participation and interest would increase.

c. Implementing Sustainability Practices

i. Part of the Vision—Place-Based Management

By resisting the influence of corporate industries with a record of careless, profit-driven fishing practices, the Sitka community is uniquely positioned to implement place-based, ecologically sound management and fishing practices. The Sitka fleet is highly localized; many fishermen who hold quota and land fish in Sitka also live there. Jeff explains that he used to live in Washington, but did not “feel right” benefitting from Sitka’s resources and not living in or investing in the community. He feels a strong conviction to keep coastal communities vital. Another fishermen, Walter, tells of sailing here decades ago with his wife and fishing halibut by handline off a boat with no depth meter. Since then, he has upgraded his boat, but has not left the community.

Stories like Jeff’s and Walter’s reveal the cohesive nature of Sitka’s fishing community that makes place-based management and community-driven environmental protection measures possible. Sitka boasts Alaska’s only approved Local Area Management Plan (LAMP). The Sitka Sound LAMP was designed in response to concerns of localized halibut depletions due to heavy fishing pressure from commercial, sport and personal use

fishermen. The LAMP established that Sitka Sound was closed to commercial fishing by vessels over 35 feet and placed seasonal and geographic restrictions for fishing in the Sound on sport fishing boats and fishing vessels under 35 feet. The creation and implementation of the LAMP was a unique, community based response to perceived resource depletion that resulted in state and federal regulators agreeing to uphold the terms of the LAMP. When the Sitka Sound LAMP was finalized and enacted in 1998, the NPFMC and the state regulating body, the Alaska Board of Fisheries, jointly adopted protocol for the submission and approval of LAMPs.¹⁰⁹ The implementation of the LAMP was spearheaded by ALFA in an effort to work with state and federal regulators. A RAM staff member explains the process of designating the Sitka Sound LAMP, “For example in Sitka...Sitka is not huge, but it has a lot of tourism now, a lot of charter fishing...and a small boat IFQ fleet.” To prevent conflict between user groups and protect the health of local stocks for use by the community, “they have done a Local Area Management Plan for Sitka Sound—the state board of fish has done this, and the council has been involved in order to make sure that the effort isn’t concentrated in one space... so local areas have taken some steps, but not just because of IFQ, because of overall activity going on in the same fishing grounds.” The hope was that following Sitka’s implementation, other communities would subsequently devise and implement LAMPs. This hope has not come to fruition. Another RAM staff member acknowledges that, “it’s a huge amount of work to get state and federal all on the same [page]...but I think it has really worked out for [Sitka].” The Sitka Sound

¹⁰⁹ “Environmental Assessment of a Regulatory Amendment for a Local Area Halibut Management Plan for Sitka Sound”, United States Department of Commerce, September 16, 1999, http://www.fakr.noaa.gov/analyses/halibut/ea_lamp.pdf.

LAMP provides an example of place-based spatial co-management of resources to preserve the biological sustainability of local stocks as a community resource.

ALFA has a history of advocating for clean fishing practices in the Sitka that precedes the LAMP initiative. Behnken explains, “I took over running ALFA because I wanted to fight against trawling...it took years and a lot of nasty stuff, but this whole area east of 140 W longitude is closed to trawling.” Sitka and other Southeast communities joined together to put pressure on NMFS to declare a trawling ban on the area, enacted in 1998 along with the other measures. As mentioned in the context of Port Orford, trawling has been compared to “clear-cutting” the ocean floor.¹¹⁰ There is particular concern about impacts of trawling on cold-water corrals that provide essential nursery habitats for fish.¹¹¹ Trawl fishing also produces the highest amount of bycatch. This is particularly problematic issue for fishermen who have watched halibut quota decline over the years. Behnken contrasts the two figures for emphasis, “The bycatch of halibut in the Gulf of Alaska by the trawl fleet is 5 million pounds. The whole Southeast quota this year for the directed halibut fishery was 2.6 million pounds.”¹¹² After the ban took effect in 1998, the trawl quota allocated to the Southeast was reassigned to another management area in response to the local effort.¹¹³

During my time in Sitka, two boats trawled for Pacific Ocean Perch near Yakutat another Southeast community. When the processor in Yakutat refused to buy the fish, one

¹¹⁰ Hilborn, “Moving to Sustainability by Learning from Successful Fisheries.”

¹¹¹ David Witherell and Cathy Coon. “Protecting Gorgonian Corals Off Alaska From Fishing Impacts.” *Journal of Marine Science* 57 (2000): 771–777.

¹¹² Ed, Ronco, “Processor’s Trawl Fish Purchase Raises Sitka Ire,” *KCAW*. Sitka, AK, August 2, 2012, <http://www.kcaw.org/2012/08/02/processors-trawl-fish-purchase-raises-sitka-ire/>.

¹¹³ NMFS, “Groundfish of the Gulf of Alaska FMP,” *North Pacific Fishery Management Council*, n.d. <http://www.fakr.noaa.gov/npfmc/fishery-management-plans/goa-groundfish.html>.

of the Sitka processors agreed to buy the fish despite the fact that it had been caught via trawl in a banned area. The Sitka fishing community responded strongly against this action, circulating a letter signed by community members in opposition to Silver Bay Seafood's purchase of the catch. Sitka's radio station, KCAW, covered the issue in a brief article entitled "Trawl Purchase raises Sitka's Ire." The article quotes Captain Richie Davis, a signatory, saying, "I just wanted the people of Sitka to know there are other activities that go on out here that aren't necessarily compatible with the future of what you've built your community on." Beyond the symbolic importance of opposing trawling practices, the purchase has implications for future policies and allocations that Sitka wants to avoid. In the article, Linda Behnken comments, "'We've protected this area from [trawling], protected the habitat from that, and don't want to see those gains, in terms of resource protection and community level protections, reversed...So I think that's why this is a much bigger deal than one trawl delivery,' she said. 'It's concern about the precedent being set, and what that might lead to.'"¹¹⁴ As the council considers converting GOA groundfish to catch share, they will evaluate historical data from the fishing fleet as well as the processors to assign quota. Behnken does not want trawl quota assigned to Southeast as the communities—commercial, charter and subsistence fishermen—have clearly united against it. The topic of the controversial purchase came up while I was speaking with Linda Behnken on the docks at the commercial harbor. One of the fishermen proposed a protest or a boat blockade the next time that particular vessel comes into the area. The anti-trawling focus of the Southeast Alaska fishing community, lead by ALFA, demonstrates the

¹¹⁴ KCAW "Processor's Trawl Fish Purchase Raises Sitka Ire."

power of communities in advocating for cleaner fishing practices and place-based conservation.

ii. Cleaner Fishing—The Fisheries Conservation Network

A critical component to the three corners of community-based fisheries management envisioned by Behnken is ongoing conservation efforts through cleaner fishing practices enacted through the Fisheries Conservation Network (FCN). The FCN is a group of ALFA fishermen who have volunteered to experiment with various gear, monitoring and reporting systems intended to improve the fishery by making it more efficient and reducing bycatch and other environmental impacts. The FCN builds on the framework, “...fishermen are among the most innovative and resourceful people on the planet...With fishermen-generated ideas, we design tools that assist the fleet in mentoring other fishermen and improving best fishing practices.” FCN director Natalie Sattler explains some of the FCN’s current innovative projects. FCN fishermen are working with a varied group of marine mammal researchers to develop gear that deters whale predation on longlines. Sperm whales appear to have learned to eat off the lines; fishermen have watched tens of thousands of dollars of fish get eaten off the line. This can devastate a fisherman’s harvest, is detrimental to the animals and provides an opportunity for conflict between fishers and animals. FCN fishermen are initially reporting that beaded lines seem to deter the whales, and participating fishermen see an added benefit in the compensation they receive for testing the gear.

FCN boats are also testing an electronic vessel monitor systems (VMS) modeled off the technology used in Canadian fisheries. There has been discussion of requiring even small fishing vessels to carry observers to monitor the catch, bycatch and report

infractions. Observer coverage has been shown to reduce bycatch substantially as fishers are held accountable for the prohibited species they catch. Carrying observers incurs a heavy financial and labor burden on small fishing vessels. Electronic monitoring has the potential to satisfy accountability requirements while avoiding direct costs to fishermen. Natalie Sattler discusses this project, “We have had a lot of interest in the electronic monitoring observer system and the viability of this approach to work within our fleet. Many of our FCN boats have willingly tested the system.”

ALFA is also working with FCN participants on mapping projects, mapping bycatch and ocean floor habitat to produce bathymetric maps for the fishermen to use for bycatch avoidance. Natalie hopes that the creation of the bathymetric maps will get more fishing vessels involved, “providing the fishermen with this information and sharing knowledge increases the fishing community support and it grows from there. Most of them have been here for a long time—these fishing families and they have people all over town. I think that hopefully they...want to be involved.” Linda echoes that these conservation and fishery improvement trials have been a great success. Researchers from University of Alaska, the Scripps Institute of Oceanography, and the Sitka Sound Science Center with which ALFA shares a building have all partnered with the FCN on research projects to promote cleaner and more efficient fisheries. The innovative projects that bring together scientists and fishermen in cooperative research demonstrate the opportunities possible when local fishermen are involved in managing the resource on a local level.

iii. The Fish Itself—Charter Fishing and Direct Marketing

As Sitka fishers work to preserve their identity and heritage as independent and community-based in the face of corporatizing fisheries, they must also contend with a

rapidly growing sport fishing sector brought in by tourism. Tensions run high between sport fishers and commercial fishers, as they vie for the same resource. In Sitka, halibut is the contentious species because the charter halibut fleet is large and the resource limited and valuable. The topic came up in my conversation with Linda, “in 1993 the increase in the charter fleet resulted in just a straight reallocation of quota, they simply took it from us and gave it to them. They say, ‘well we bring the people to the fish,’ and we say, ‘well we bring the fish to the people.’” ALFA fisherman Walter echoed her sentiments while chopping chum salmon as bait in preparation for a sablefish trip; he called sport fishing a tragedy. The customers catch all these beautiful fish and then cut them loose to die, and then go “brag about it and tell all their friends to come to Sitka to do the same thing.”¹¹⁵ Throughout the coexistence of the two fleets there has been considerable mutual blaming of who is at fault for overfishing the halibut stocks. The Sitka Community Profile reports “unregulated charter halibut businesses for 10 to 15 years depleted local stock and, that while the reduction in charter fishing has a negative effect on the local economy in the short-term, the imposition of limits on charter fishing is overall good management of fish stocks.” Commercial fishermen claim that sport fishing pressure was higher than reported for a number of years.¹¹⁶ Natalie Sattler knows both industries well, “there will always be testimony by commercial and charter saying why they need this or want this...but its all about livelihood, and there are some fishermen out there that care a lot about the resource and some that don’t care at all and they are on both sides.” From some commercial fishers perspective, growing sport fishing takes away from their access to the resource that they use to support themselves and their families.

¹¹⁵ Group Interview, July 25, 2012.

¹¹⁶ Himes-Cornell, “Community Profiles.”

As commercial fishermen work to protect their access rights to fish for food markets, ALFA is also redefining the seafood system through its CSF, Alaskan's Own (AO). AO was started in 2010 with only 18 subscriptions in Sitka and farmers market sales, but has expanded locally as well as to Juneau. AO markets itself as "investing in the future of wild Alaskan fisheries and in the artisanal fishing communities whose caring practices are vital to ocean health."¹¹⁷ The CSF purchases from local fishermen and works with Sitka processors to prepare and flash freeze the shares before shareholders pick them up. AO not only gives local fishermen a reliable market, but also improves the food system in Sitka. Organizer Natalie Sattler explains, "people love to have that option because even though you live in a town that's right by the ocean it is hard to get your hands on fish..." The grocery stores in town do not necessarily stock fresh, local fish; it is often expensive and re-imported after processing even if it was originally from Sitka. AO is ALFA's attempt to reject corporate control over seafood systems, and an important piece of the community-fishery model.

The CSF also reinforces participation in clean fishing. AO sources predominately from boats that participate in the FCN. Sattler believes its is a natural choice, "...all of the fishery conservation network members who were going out and doing this on the ground research for us are...committed to a sustainable fishery...they want to improve the resource not just for what's going to help them out but also for future generations." The commitment to working with FCN members is also important for the sales and marketing of AO. She adds that by sourcing from FCN boats, "we are making the commitment that we

¹¹⁷ "Alaskans Own Seafood", n.d. <http://www.alaskansown.com/>.

want to work with these folks that are committed to sustaining and improving the resource. And I think that is part of the catch...a lot of [our customers] are really aware of that and they want to support that type of fishery.” Fish caught by Sitka fishers for sport, for export and for local sales represents the varied goals of fisheries participants and the complexity of working in a multi-stakeholder system.

d. The Future of ALFA and Sitka

Sitka has managed to sustain vital fish stocks and a vital fishing community, aided by relatively favorable policy outcomes, local leadership and a sustainable industry. However, ALFA seeks to define community-based fisheries co-management among the Sitka fleet in recognition of the constant threat to the ideal of an independent, community-based fishery. ALFA’s work has a longer time frame than that of Port Orford, a fishing community on the brink of extinction. Sitka fishers are working so that the next generation has the same opportunity to preserve the same values they possess today. Linda’s vision of the three part framework for a community fishery—Alaskan’s Own marketing a sustainable resource, the FCN working to ensure that fishing practices remain sustainable, and the Trust that ensures that responsible fishers have continued access to the resource—serves as a successful answer to the question of what community-based fisheries co-management looks like in practice. Behnken and ALFA do not believe that their work is done, using the CSF as an example, she claims, “but to really have an impact, to sort of achieve a seat at the table in terms of policy and politics, I think we have to go outside of these little communities. That’s part of what I hope the [Community Fisheries] Network can do.”

III. A Nod to California—San Diego and Santa Barbara

Back in California for the fall semester, I looked to community fisheries movements along the southern part of the West Coast. My field visits were more thorough in Sitka and Port Orford, so the following analysis is intended to diversify my discussion, recognizing that the California examples I include are less thorough and more anecdotal. My examination of community fisheries in Port Orford and Sitka represented one perspective, despite being more involved. I will not presume to holistically represent the issues facing fishers and organizations in San Diego and Santa Barbara given the limited time I spent examining their contexts. Nonetheless, these places are important members of the community fisheries movement and the CFN.

a. San Diego

The inclusion of the quintessential California beach city of San Diego in this discussion broadens the definition of a fishing community. My experience of the fishing industry in San Diego was limited to a few hours walking the docks with Peter Halmay, an urchin diver and staunch fishing advocate who has worked the waters off the coast of San Diego for decades. Halmay is currently the director of the San Diego Fisherman's Working Group (SDFWG). San Diego possesses a long and rich fishing history; however this history has faded as the population of commercial fishermen dwindled. Only 120 fishers fish commercially out of San Diego harbors, compared to a population of 3 million. San Diego does not conform to the traditional understanding of a fishing dependent community. Despite their numbers, the 120 commercial fishers of San Diego make up an important

community within the larger urban setting, dependent on fishing to support themselves and committed to the future of the industry.¹¹⁸

Though San Diego was once a vital fishing town, stock depletions and industry shifts took an early toll on the persistence of commercial fishing. As early as 1919 to 1921, the San Diego fishery had peaked, and overfishing threatened species including halibut and tuna.¹¹⁹ At its peak, the San Diego tuna fishery was supplying 60 percent of the country's tuna.¹²⁰ By the 1960's, the tuna fishery was already declining due to cheaper imported tuna and expensive bait. A brief foray into industrial tuna seining with nylon nets and bait-less technology made American tuna fishing temporarily competitive with the Japanese industry. However, porpoise bycatch using these methods was extremely high. Due to environmental pressure in the 1990's, major canneries switched to selling only dolphin safe tuna, and the industrial tuna fleet that had once numbered over 200 boats ultimately dropped to eight. The boom of the industrial tuna fishery replaced the traditional market fisheries for rockfish, coastal pelagics, dive species and others. When the tuna industry collapsed, there were no longer any other active fisheries in San Diego.

Despite the obstacles, commercial fishing has persisted in San Diego. In 2000, San Diego fishers held 463 federal and state permits and landed coastal pelagics, crab, groundfish, shrimp and other species.¹²¹ Peter Halmay and others believe, despite the historical declines, that the San Diego fishing industry has a future. His perspective is shared by the Port of San Diego, which embarked on an industry revival plan in 2008 with a grant from the California Coastal Commission. The Port projects an increase in demand for

¹¹⁸ Peter Halmay, Personal Interview, October 6, 2012.

¹¹⁹ Norman et al., "Community Profiles."

¹²⁰ Halmay, October 6.

¹²¹ Norman et al., "Community Profiles."

local fish, citing consumer studies that indicate that Californians would buy California seafood if they learned about the conservation safeguards in place. Consumers particularly support the small-boat model; the study states that 90 percent of Californians do not see “family-run” commercial fishing boats as an environmental threat. Halmay, his fellow divers and other gear types align with these ideas.¹²²

Halmay was my only informant about the San Diego fishing community; he also represents SDFWG as a new member of the Community Fisheries Network. The organization was founded in 2010 to “protect the commercial fishing interests and opportunities in San Diego.”¹²³ The organization included representatives from the 5 major gear types: trap, dive, net, experimental, and hook and line. Halmay represents the experimental dive fishery, supporting himself and his family by diving for urchin. Though SDFWG is relatively new, Halmay has a long history of involvement in improving the resource and defining collaborative research. While efforts of groups in Sitka and Port Orford focus on measures to preserve the identities of their towns as fishing communities, Halmay and SDFWG dream of returning a vital, market-based fishery to San Diego.

i. Collaborative Research and Conservation

Peter Halmay has worked in collaboration with UCSB ecologist Dr. Stephen Schroeter building a 10-year data set documenting sea urchins in the Point Loma region.¹²⁴ Halmay and other divers collect urchin data along the transects that they dive during harvests, and Schroeter has also contributed 25 years of larval settlement studies.

University of Washington professor of fisheries science and noted fisheries expert Ray

¹²² “Commercial Fisheries Revitalization Plan.” *Port of San Diego*, n.d. <http://www.portofsandiego.org/commercial-fisheries.html>.

¹²³ San Diego Commercial Fishermen’s Working Group Facebook Page.

¹²⁴ Hilborn, Ray, and Steve Schroeter. “Appendix 1-A-1 Report on Sea Urchin Stock Assessment Workshop”, July 15, 2006. http://www.opc.ca.gov/webmaster/ftp/project_pages/CA_Fisheries/SDWA_Final_Appendices.pdf.

Hilborn has also worked on the collaboration. He cites the importance of this project, because the “state doesn’t do much of [the monitoring].”¹²⁵ Hilborn and Schroeter published a paper evaluating sampling protocols utilized by the fishermen and the protocol advocated by the Department of Fish and Game, concluding that data collection by divers was accurate.¹²⁶ For Halmay and others in the industry, careful monitoring is both ecologically and economically important, “...for these sedentary animals, and that they are spatially explicit, you really have to do it at a fine scale. To set global catches is completely absurd, you’ve got to look at each patch and take the right amount of animals from each one at the right time so that you maximize your production for sea urchins...” He explains that he was skeptical that the research regarding urchin settlement studies would lead to any valuable information, but continued the project because of his friendship with Schroeter. Halmay has since realized, “only when the data set gets that long do you really begin to see stuff coming out of it...I see that there is a completely different pattern on the islands than on the coast. Plus we were looking at purple sea urchins and red sea urchins, it allowed us to compare a fished to an unfished and recognize...there isn’t a change in larval availability caused by harvest....” This type of fine-scale spatial and population data made available through collaborative research is valuable for both managers and fishers seeking to ensure the sustainability of the resource.

The urchin project demonstrates that collaborative research and data collection is essential for the fine-scale data necessary for successful management of local stocks. State and federal agencies simply do not have the resources necessary to obtain localized data

¹²⁵ Hilborn, July 17.

¹²⁶ Stephen C. Schroeter et al., “Moving from Data Poor to Data Rich: A Case Study of Community-Based Data Collection for the San Diego Red Sea Urchin Fishery,” *Marine and Coastal Fisheries* 1, no. 1 (2009): 230–243.

coast wide. Hilborn confirms, “the agencies do not have the resources to conduct surveys...they can do for fisheries that are worth millions and millions and dollars.” Fisheries like the San Diego urchins “are much more like—well they are—small-scale artisanal fisheries.” Money proves to be a major driver in regulatory processes. When I asked Halmay if state and federal managers were coming around to the idea of community-based management, he responds, “if you are collecting the data and they are satisfied with it, they will...mainly because they don’t have the funds to do the data collection that’s needed, even for mackerel, they don’t have the money for swordfish, for any of these, so if the guys start bringing in good data, the regulators are going to be on board.” Halmay jokes, “this is the biggest concentration of research vessels anywhere in Southern California!” indicating the commercial fleet docked at Driscolls’ Harbor. Research partnerships between scientists and urchin divers have resulted in working partnerships and friendships between those involved—Halmay references how Hilborn respects fishermen by listing them as coauthors on his papers—as well as better conservation and harvest practices enabled by the localized urchin data set.

The urchin project has great significance for the future of collaborative research and for the future of the San Diego commercial fishing industry. Peter Halmay explains the relevance of fishermen’s collective knowledge about the resources that their livelihoods depend on sustaining:

People say, ‘you’ve been collecting data, that’s like a fox guarding the henhouse.’ And ten years from now they won’t be saying that. Of course its natural for fishermen—they know more about it, they should be collecting, but it’s not now. But I think you can change the mindset of everybody to think ‘yes, fishermen are good at collecting data.’ What a fishermen is good at is spotting patterns. That’s what a fisherman does. When the clouds are this way, the current is that way, and so on. Certain things happen, and you look for those patterns, so all we are doing now in this data collection is...trying to put numbers on how we think. Turn fishing thinking—fishermen’s ecological knowledge—into numbers, that somebody like Ray [Hilborn], somebody who does modeling like Neko, can turn it into something that everyone understands.

Particularly in California, environmentalists target fishermen for stripping the ocean of its bounty. Recent campaigns from the Pew Foundation and the Environmental Defense Fund have targeted the commercial harvest of forage fish, resulting in council rulings to minimize the harvest of these species.¹²⁷ Collaborative research to produce fine-scale data and more accurate, place-based management recasts fishermen as the stewards rather than as those who are responsible for exploiting the ocean. Certainly, some fishermen do not act as stewards, particularly those during past decades who contributed to the various collapses off the California Coast. However, Halmay is working to reduce competition between fishermen in the urchin fishery and they are working on honor-based governance to prevent overfishing. He also worked to end a misguided state urchin extermination project.¹²⁸ He strongly believes that the ecological knowledge of fishers make them ideal research partners and establishes them as potential conservationists. Hilborn affirms, “fishermen in my experience, generally have a lot of concern, not all of them, but most of them, a lot of concern about sustainability...” However, if regulatory structures privilege irresponsible harvest, sustainable practice gets squashed. Research and data collection collaborations produce the quality of data needed for good management, and recast the identity of fishers in their relationship with science.

ii. Building a Narrative of Sustainability for Direct Marketing

Sustainability in fisheries has become an important sales and marketing tool. San Diego fishermen stand to add value to their product by marketing a narrative of sustainability, supported by their model of small boats, minimal bycatch and engagement

¹²⁷ “Pacific Forage Fish Campaign - Pew Environment Group,” *Pew Environment Group*, n.d. <http://www.pewenvironment.org/campaigns/pacific-fish-conservation-campaign/id/85899360413>.

¹²⁸ Dave, Good, “Fishing With the Urchin King Pete Halmay,” *San Diego Magazine*, June 2012, <http://www.sandiegomagazine.com/San-Diego-Magazine/June-2012/The-Urchin-King/>.

in research-based conservation. Urchin fishermen can sell their catch to the local processor for about \$1, or sell them directly off the dock to restaurants and individuals for \$4.¹²⁹ The success of dock sales inspired Halmay and others to think about other opportunities for direct sales. He and his son started collaborating with one of the groundfish fishermen to have a dockside market on Saturdays. Halmay's vision is to expand this market to become a permanent, daily feature on the dock of San Diego's downtown commercial harbor. Standing with Halmay on the dock, he gestures across the harbor:

...we start the market here, 5, 6, 7, boats and a few booths, and later on, we are talking about putting a barge here...where boats can pull up and people walk out to buy fish, right on the water...7 days a week... and its centrally located...we will have to persuade the port to come up with the money to build it, once we prove to them that the public really wants to come down here to buy fish.

Halmay explains that San Diego is unique from other small fishing towns working on direct marketing. Finding a customer base does not present an obstacle in a city of three million. Halmay comments, "we have a small group of fishermen but a large market...we know the people are there, we have a compelling story...its consistency of delivery and then everything else fits in, you can say all the other stuff about the community, but what you are doing is supplying the community with fish...you come down to the docks and you get sea urchins with zero fish miles." Halmay's fish market would be reminiscent of the San Diego markets of the 1920's, featuring at least 25 local species, what he calls "portfolio fishing...you don't put all your baskets in one fish." Local fish is a critical component of the local foods movement; the San Diego chapter of Slow Food has collaborated with SDFWG fishermen. These partnerships and the resulting sustainability narrative are slowly

¹²⁹ Halmay, October 6.

aligning the interests of fishermen and environmentalists who had historically been at odds.

Direct marketing the catch of the small San Diego fishing fleet will bring greater profits to the fishermen because the “middlemen” have been replaced by fishermen. Consumers willingly pay more for a high value product with a narrative of sustainability and human connection. Halmay wants to “prove to [consumers] that it’s worthwhile for your community to have that knowledge, so when you buy sea urchins here you are assured that everything has been done by the fishermen to make sure that it is sustainable.” Higher profits will help the fishermen continue to fish responsibly. Halmay worked with a friend from a community bank to assess what might help the San Diego fishermen. The community banker compares the resource to housing, “I hope you are not insulted, [the fisheries] look like ghettos. You can change this by taking some pride in the work and making money in fishing...the money has to come first, and then you will take care of it...you won’t have to cut corners, you won’t have to do certain things because, if you don’t have any money, you might have to poach a little bit.” Direct sales bring higher profits to fishermen, which reinforces more careful, sustainable fishing practices, appealing to direct market consumers. The process is completely traceable, the fishermen know exactly where they harvested their catch, and understand the significance of their harvest in the context of sustaining the resource because of the ongoing research and data collection.

Halmay also envisions the market as the organizing point for the future of community-based management, “we are going to use this market as a place that we get together and talk.” He imagines the market as a venue to ask questions, “How do we bring

another fisherman in? Not to compete with us at the market level? And move back into working as a community?” Direct marketing in San Diego follows a different model than the CSF-share model adopted by Port Orford, Sitka and others. The market model seems fitting for a populous city equipped with a broad base of potential consumers and a downtown harbor. Direct marketing urchins and rockfish is already a successful endeavor, implementing the project on the larger scale would only further incentivize sustainable fishing practices and consumer support for a local, small-scale fishery.

iii. Assessing Importance

In the case of San Diego, it is easier to question the importance of preserving a small-scale, local fishing fleet. For Port Orford and Sitka, the motivation is clearer—to save the town, to ensure that the cleanest fishermen have access to the resource, to keep the economic gains in the community. Halmay expresses the dilemma, “We’ve got a bunch of small fishermen just hanging on, and as I said, in a population of 3 million, you could wipe it out and nobody [cares]. But we want them to say ‘hey, one minute, where am I supposed to buy local fish? Where the hell am I going to buy local fish when those six guys are gone?’” San Diego fishermen also worry about future questions of access with the implementation of catch shares for groundfish. Halmay’s personal narrative of his relationship with fishing and with trying to improve fishing in San Diego offers a powerful testament to the importance of maintaining commercial fishing in San Diego:

It’s my lifework, its something that gave me an opportunity to do something, that shouldn’t be erased from anybody. Fishing is a part of the heritage, the culture and so on, and to me that’s important. To me, wiping out part of that fabric is wrong, its just plain wrong. And so I’ve committed a lot of work, hundreds and hundreds of hours, because I think its important, and its not important financially, none of the financial benefits are going to come in the next five years, but in the next ten years, you will develop something, where young people coming in will be better off. I’ve learned how to do things, how not to do things, and how things should be done. I don’t want just people doing things the way we’ve done it, there is a better way of doing this, that it can be, if you have the social capital,

you will have order in the harvesting, you will have sustainability, and you will make money. You can have all three...

Halmay's battle to preserve a small-scale but vital fishery in San Diego faces many obstacles considering the trends coast wide. Hilborn worries that "California may see a complete loss of commercial fishing...It is getting more and more expensive because other people want waterfront space and they are willing to pay for it, a lot more than the value of those fisheries. So guys like Pete Halmay feel like they are an endangered species."

Preserving commercial fishing in San Diego is a benefit to both the health of local resources and the population. Divers like Halmay and other members of the SDFWG have demonstrated the knowledge of the ecology of resources like urchins as well as sustainable harvest through collaborative research. These projects prove the worth of commercial fishermen as stewards and conservationists, which in turn affirms the sustainability of the resource. Access to a local, sustainable food source is an idea that communities around the world are working to achieve. Preserving commercial fishing in San Diego maintains the connection with the local history of the industry, "When a fisherman is selling their catch, first you tell their story...it's a great story, its not about sharks and so on, it's a way of life, its camaraderie, all the fun stuff about the way America used to be a hundred years ago and these guys are still here doing it..." The culturally significant fishing legacy coupled with the current efforts to pursue clean fishing practices, localized research, resource conservation and direct marketing provide a powerful argument for the importance of maintaining commercial fishing in San Diego.

b. Santa Barbara

In Santa Barbara, like in San Diego, other prominent factors mask the city's commercial fishing industry. Though the Santa Barbara channel is known for being a

highly productive fishing area, in 2007 there were only 201 full-time commercial fishermen working out of Santa Barbara, compared to a total population of just below 90,000.¹³⁰ Jono Wilson, a post-doctoral fisheries researcher with the University of California, Santa Barbara, comments, “I would bet that the majority of Santa Barbara residents don’t even know that there are really productive fisheries offshore here.”¹³¹ The Santa Barbara Channel contains four commercial harbors: Ventura, the Channel Islands, Port Hueneme and Santa Barbara. The largest number of commercial vessels fish out of Santa Barbara harbor. In 2011, 6.3 million pounds of fish were landed in Santa Barbara Harbor for a total of 9.9 million dollars in ex-vessel value.¹³² The average value of landings from 2002 to 2007 between the four harbors was \$22 million. Coastal pelagics, crab, groundfish, highly migratory species, salmon, shrimp and other species including lobster and urchin were the primary species fished out of the Santa Barbara harbors.¹³³

Like most fisheries in California, the restrictions on commercial fishing have diminished the robustness of the Santa Barbara fishing industry. A 2007 California Sea Grant report on the infrastructure needs of the local commercial fisheries indicates, “significant reductions in fishable areas, quantities and species, and fishery participants...leading many to question the future of commercial fisheries.” The report identifies the recent boom in protected areas, implemented under the State’s Marine Life Protection Act and federal closures because of conservation concerns. The waters off the shores of Santa Barbara are spatially restricted by Channel Islands Marine Protected Areas

¹³⁰ Carolyn Culver, John Richards, and Caroline Pomeroy, “Santa Barbara Channel and Associate Infrastructure Needs”, 2007, <http://www.csgc.ucsd.edu/BOOKSTORE/FEE%20PUBLICATIONS/documents/CulverSB.pdf>.

¹³¹ Jono Wilson, Personal Interview, October 2, 2012

¹³² “Total Commercial Fishery Landings At An Individual U. S. Port For All Years After 1980”, n.d. <http://www.st.nmfs.noaa.gov/commercial-fisheries/commercial-landings/other-specialized-programs/total-commercial-fishery-landings-at-an-individual-u-s-port-for-all-years-after-1980/index>.

¹³³ Normon et al. “Fishing Profiles.”

(MPAs), RCAs, Cowcod Conservation Areas, the nearshore gillnet closure and trawl exclusion zones.

Other limitations on fishing are groundfish and nearshore finfish quotas and economic obstacles like poor export markets, competition with imports and increasing operating costs. The Sea Grant study also surveyed local fishers from the four harbors, asking them to identify what they view as the primary challenges to the future of the fishing industry. The top three challenges identified were: “1) the disconnect between local communities and their fisheries (which impact access and management, as well as local market opportunities), 2) economic viability (including operating costs and management), and 3) increases in marine mammal interactions.” Furthermore, the industry has difficulty attracting new entrants because the “fishing industry is perceived as a dying industry.”¹³⁴ These concerns were outlined in 2007, and may have changed or been replaced in the subsequent years by an entirely new set of concerns. However, these concerns are representative of statewide trends in the fishing industry. I did not corroborate these issues with local fishers or organization members.

To learn about the current status of fisheries in Santa Barbara, I interviewed Jono Wilson, who conducted research in conjunction with local nearshore fishermen to evaluate the impact of closures on commercial fishing and assess how fish populations are responding to protection. Wilson explains that these closures have significantly impacted nearshore commercial fisheries such as urchin, crab and rockfish. UW fisheries scientist Ray Hilborn spoke about the efforts of UCSB scientists who have been working with fishermen to define localized management, particularly for lobster. He believes that

¹³⁴ Culver “Infrastructure Needs.”

localized management would be highly beneficial for nearshore fisheries, but does not believe that the state has been receptive to these efforts. Hilborn comments, “They are miles from having any sort of real management except the really very marginal management that the state does.”¹³⁵ In Santa Barbara, management and conservation measures have negatively impacted the local fishing industry.

i. Organizing for Community-Based Fishing

The Commercial Fishermen of Santa Barbara (CFSB) is the community organization spearheading efforts to organize the local fishing community under the community-fishery model. The organization represents Santa Barbara within the Community Fisheries Network. CFSB works to build collaboration between fishermen and fishery scientists to develop a co-management approach. Current projects include establishing monitoring protocols, implementing effective stock assessment data collection, supporting socio-economic fisheries research and adding value to local fish products. CFSB sees value in maintaining California’s commercial fishing heritage, and looks to improving management to affect these changes while prioritizing ocean health.¹³⁶

Jono Wilson is optimistic about the potential for making change on a local scale in Santa Barbara. When asked about the fishing community, he comments:

I think the climate is probably the most ripe [here] for change and progressive fisheries management...there are really smart fishermen here, who are progressive and they have thought a lot about how to better manage fisheries...they are becoming a critical mass of fishermen in the harbor who are really wanting to change things because they see the current way that management is operating isn’t really benefitting them, and often putting them out of business sometimes, and so they want change.

¹³⁵ Hilborn, July 17.

¹³⁶ “Commercial Fishermen of Santa Barbara”, n.d. <http://cfsb.info/forum/>.

As an outside researcher, Wilson has balanced view about the role of CFSB. He qualifies, “Some fishermen really like the idea of CFSB, some people are vehemently opposed to participating in the process,” he sees the organization as more of a voicing platform. Though some fishermen are highly invested in making change, Wilson again qualifies that there are also many fishermen who “don’t want change...they don’t want intrusion into their lives.” In general, he is optimistic, “there is opportunity for collaboration and community-based management” in Santa Barbara. The goal of community-based management for Santa Barbara is less focused on ideas about maintaining access to quota; there is not much internal momentum for a model like the one that Port Orford is pursuing. Wilson believes in the value of these structures, “if you have community quota banks, you can more accurately manage landings and quota to the local ecosystem. I think if you could manage at the local scale, have local quota banks, then you could more appropriately match how much fish should be removed from this local area.” The work of CFSB is less focused on maintaining access by obtaining quota than other communities, possibly because they primarily fish state permits, which are less limited than federal permits. The local fishing community appears more focused on strengthening management by improving local science.

ii. Research partnerships

Wilson is directly involved in collaborative research with Santa Barbara commercial fishermen. He and others hope that localized data collection will help mediate between commercial fishing interests and sweeping, coast-wide conservation closures. He explains that 90% of the world’s fisheries do not have enough information for complex stock assessments and large-scale modeling; he hopes to demonstrate that simpler, small-scale

models comparing stocks inside and outside no-take zones can help establish the limits for appropriate fishing pressure. He reports on the differing responses between the fishing community and the managers, “The fishermen were really receptive to this method because it was transparent and easy to understand. This method isn’t in use right now. The state hasn’t bought into it...it is legislatively difficult to change the status quo.” He is optimistic that once these collaborative methods are proven on the local scale, state and federal managers will support their implementation because these methods are cheaper, more transparent and involve fishermen.

iii. Developing a Community Supported Fishery

Santa Barbara recently launched the pilot season for Community Seafood, its share-based direct marketing program. The CSF hopes to increase profits to fishermen struggling because of limited access by selling direct to Santa Barbara consumers who will pay a premium for high quality seafood rather than selling at lower prices to processors in Los Angeles, who export the product. In a September article about the CSF, both the fishermen and the 94 shareholders were pleased with the partnership. Fishermen were happy to make more for their fish, but also happy to know who was buying their product and that the customers were content.¹³⁷

iv. Moving Forward

The survival of sustainable, small-scale fisheries in the Santa Barbara Channel depends on reconciling the conflict between managers and conservationists closing large areas to fishing based on coast-wide conservation goals, and the community-based fishers

¹³⁷ Emily Johnston, “Community Seafood Gaining Momentum,” *News-Press*, 2011, <http://www.communityseafood.com/wp-content/uploads/2012/09/Community-Seafood-gaining-momentum.jpg>.

who want to harvest fish sustainably. Like in San Diego, the fishing industry has historically been painted in opposition to environmentalism. The Sea Grant report concludes, “Most of the SBC’s commercial fishery resources are diverse and presently healthy, albeit dynamic and in need of management that is more adaptive and coordinated...Long-term sustainability of local resources and fisheries requires coordination among these and other management tools, and adaptive management that responds to changes in the ecological and human dimensions of fisheries.”¹³⁸ The average number of years of experience of the Santa Barbara commercial fishermen is 27 years; co-management models and collaborative research partnerships draw upon the significant, collective ecological knowledge of the fishing community. Pursuing these collaborations and adaptive management approaches has the opportunity to redefine Santa Barbara fisheries so that conservation and harvest can coexist.

¹³⁸ Culver, “Infrastructure Needs” iii.

Chapter 4: Discussion—Definitions and Context for Community-Based Fisheries Co-Management

I researched fishing communities—Port Orford, Sitka, San Diego and Santa Barbara—to learn about the concept of community-based fisheries co-management and how people are attempting to implement these ideas. This “concept” evolved into unique and complex narratives, containing linked vignettes of internal and external conflict, financial innovation, conservation, pride and concern. In this chapter, I synthesize these individual narratives, find common threads, and situate the nitty-gritty, real life stories and complexities within the larger discussion of resource management.

I. Fisheries, the Commons and Common-Pool Resources

a. Fisheries as the Classic ‘Tragedy of the Commons’

In his classic piece “The Tragedy of the Commons,” Hardin uses fisheries to illustrate the collapse of open access resources, which he terms “the commons.”¹³⁹ Though Hardin wrote about population growth, his theory has become central to ecology and natural resource management. H. Scott Gordon preceded Hardin in analyzing fisheries as a common property resource, concluding that common property encouraged individual competition to increase catches to the detriment of the quality of the resource, but Hardin’s theory is considered more iconic.¹⁴⁰ In a later reevaluation of Hardin’s work, Feeny et al. clarify that “commons” or “common property” resources have two characteristics: a component of excludability such that the “physical nature of the resource” does not lend itself to controlling access, and subtractability, the actions of each user take away from the

¹³⁹ Garrett Hardin, “The Tragedy of the Commons,” *Science* 162, no. 3859 (December 13, 1968): 1234–1248.

¹⁴⁰ H. Scott, Gordon, “The Economic Theory of a Common-Property Resource: The Fishery,” *Journal of Political Economy* 62, no. 2 (April 1954): 124–142.

resource available to other users. Hardin's theory assumes the demise of commons resources, "Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all." Vast and remote, ocean fisheries were used as a perfect example of a commons resource that could not be regulated and was doomed to fail.¹⁴¹

Hardin wrote "Tragedy" in 1968, before the passage of the Law of the Sea and the Americanization of fisheries under the MSA. However, knowledge of fisheries declines was well known during this period. Hardin uses the example of maritime societies, "professing to believe in the inexhaustible resources of the oceans, they bring species after species of fish and whales closer to extinction."¹⁴² Hardin's articulation of tragedy of the commons theory became reality, demonstrated by overfishing collapses during his time, and these patterns are still repeated today. Despite the fact that U.S. fisheries are no longer managed as open access, Hardin's theory still applies to the current approach to fisheries management. The ideas put forth in "Tragedy" shaped an approach to fisheries policy and regulation that is still dominant today, but as demonstrated by emerging examples of community-based co-management, this paradigm is slowly diversifying and changing.

Hardin concluded that the only viable solutions for addressing the tragedy of the commons lay in private property coupled with legal inheritance recognized by the state.¹⁴³ In an later article updating commons theory, Feeny et al. define Hardin's management regimes as either entirely privatized, turned into private property and guarded by private enterprise, or kept public with allocated rights and heavy regulation. Feeny identifies

¹⁴¹ Hardin, "Tragedy of the Commons," 1247.

¹⁴² Hardin, "Tragedy of the Commons," 1247.

¹⁴³ Hardin, "Tragedy of the Commons," 1248.

private and state management as the two regimes that “Tragedy” deems viable. Before the most recent MSA revisions, U.S. fisheries policy templates the “Tragedy of the Commons.” Initially, the federal government attempted to take over and fill in after the end of truly open access fishing with national regulatory measures. Though the Magnuson Act delegated practical responsibility to Regional Councils, these Councils still function as “state” entities in that they implement wide-scale regulations that are passed down to user groups. As illustrated by Port Orford and other fishing communities, the intended democratic processes of management councils are often lost because of domination by privileged user groups. Initial attempts at “state” level management were relatively unsuccessful, failing to prevent large-scale collapses like the infamous New England cod fisheries.

Subsequent management efforts have lauded “privatized” fisheries, described by the umbrella term “catch shares” as the next gold-standard policy for fisheries management. Many catch share programs such as ITQ or IFQ directly grant access in perpetuity to one user—the permit holder. Though these methods have been attributed with successfully preserving the biological sustainability of stocks, the very “privatization” that Hardin advocates for has raised the ire of users up and down the West Coast. Drawing from the Pacific Coast Federation of Fishermen’s Associations indictment of privatization, “This simplistic one-size-fits-all approach to fisheries management has done a disservice to the diversity of fisheries management options that have proven effective, and others that show promise. Make no mistake –the proponents of IFQs are explicit in their desire... to parcel up and privatize the ocean”.¹⁴⁴ Though we have ended overfishing for the most part off the

¹⁴⁴ PCCFA “Community Fishing Associations.”

coast of the United States, we are still operating within the policy framework legacy of Hardin's "Tragedy of the Commons." Under this model, lessening the state's regulatory oversight or corrupting the management integrity of individual rights exposes fisheries, a classic "commons," to overexploitation and tragic decline.

b. Departing from the Classic Commons Model

Though Hardin's work represents a seminal text of the field of natural resource management, we have, in some ways, come a long way in how we think about the commons as a natural resource to be used sustainably. In a reflection written on the 22nd anniversary of "Tragedy," Feeny et al. expose some of the failings of Hardin's theory. Feeny et al. argue that "communal property," not to be confused with "common property" or "commons," is an important and viable regime that Hardin ignores because he did not consider the possibility of the crucial management component of exclusion possible under communal-property rights. Feeny cites examples of fisheries management to illustrate a counterpoint that "successful exclusion under communal property is the rule rather than the exception...". Localized conservation areas created by community efforts like the Redfish Rocks Marine Reserve in Port Orford, the Sitka Sound Local Area Management Plan, and locally agreed upon urchin and lobster harvests provide further examples to support this point. These examples and others around the world "illustrate that people are not helpless but are able to organize, to monitor resource use by members, to allocate use rights among members, and to adjust aggregate utilization levels to maintain sustainable use of the resources." Feeny wrote this in 1990, but the idea has yet to become widely accepted, though he makes the point that this is not a new idea—"A diversity of societies in the past and present have independently devised, maintained, or adapted communal arrangements

to manage common-property resources. Their persistence is not a historical accident; these arrangements build on knowledge of the resource and cultural norms that have evolved and been tested over time.”¹⁴⁵

Even though Hardin does not consider a communal property approach, in some situations, such an approach is more effective. Feeny et al. point out that individual, privatized management only functions as long as it is accepted and supported by the social context. This approach provokes competition between users, which can drive “cheating” if enforcement is inadequate. State management is often not crafted with the attentiveness, resources or time that the private owners, the general public or even the government would hope for. Furthermore, state regulation is often cumbersome and can contradict the user’s experience, resulting in widespread violation causing “de facto open access” conditions. An article published by the Center For American Progress as part of their fisheries series, offers an example of the kinds of management problems that arise from a fully state-managed system:

- 1) Scientists produce new stock assessments based on inherently flawed but technically best available data that suggest overfishing has occurred in the past.
- 2) Managers impose regulations setting lower catch limits for fishermen.
- 3) Fishermen resist the lower catch limits because the scientists’ stock assessments are based on two- to three-year-old data, claim that things have been looking up in the interim, and demand new stock assessments.
- 4) Go to point 1.¹⁴⁶

Feeny et al. make a leap that Hardin does not, arguing against the historical paradigm of faith in privatization and state regulation, claiming “...co-management can capitalize on the local knowledge and long-term self-interest of users, while providing for coordination with relevant users and users over a wide geographic scope at potentially lower transaction

¹⁴⁵ Feeny et al., “22 Years Later,” 1-19.

¹⁴⁶ Michael Conathan, “Fish on Fridays: Waking from the Gluttony”, March 11, 2011, <http://www.americanprogress.org/issues/green/news/2011/03/11/9193/fish-on-fridays-waking-from-the-gluttony/>.

cost.” Feeny builds off the groundwork established by Hardin, but after 22 years of management’s direct emulation of Hardin’s prescription, Feeny diversifies to consider other potential management structures.¹⁴⁷

Renowned commons scholar Elinor Ostrom further develops the critique of the traditional “tragedy of the commons.” She too makes the distinction between the commons, and common pool resources. In “The Struggle to Govern the Commons,” published in 2003, Ostrom addresses the commons through a contemporary lens. She again uses fisheries to illustrate her points, citing both the top-down national regimes governing failing inshore fisheries as well the classic Cod example as a “catastrophic failure [...] when central governments have exerted sole authority over resources.” Ostrom’s primary critique is that Hardin failed to acknowledge that resource users have agency and have “struggled successfully against threats of resource degradation by developing and maintain self-governing institutions.” She proceeds to explore the requisites and goals for these communal and socially rooted approaches to management. She identifies resource pools characterized by: realistic ability to monitor resource use; moderate change in technology, users and the resource; high social capital; the ability to exclude outsiders; and support from users for effective monitoring enforcement, as ideal for a communal management approach. Small fishing communities with local science, multi-generational fishing history, conservation areas or exclusive rights fulfill her requisites. Such an approach rewrites the narrative of users who are trapped in commons dilemmas or who are equally trapped by “too many strategies for governance of local commons, which are designed in capital cities or by donor agencies in ignorance of the state of the science and

¹⁴⁷ Feeny et al., “22 Years Later,” 1-19.

local conditions...". Ostrom furthers the discussion of a new paradigm for the commons by typifying the important characteristics of effective commons governance by local user groups.¹⁴⁸

A growing body of literature supports this new interpretation of the management of commons resources in the context of fisheries. In "Making Space for Community Resource Management in Fisheries," St. Martin reiterates the criticisms made by Feeny and Ostrom, that there are alternatives to the regulation and privatization approach, which he critiques as a perpetuation of the capitalist approach known as bioeconomics. He takes issue with large-scale data collection and stock assessments, claiming that they do not provide adequate information on the condition of stocks at the local level where many of these species are harvested. Imprecise quantifications are institutionalized and calculated on the scale of the expansive "commons" rather than more realistic usage scales. St. Martin also levels a sweeping criticism of the manifestation of Hardin's prescribed privatization in the form of traditional catch share systems like ITQs. These individual share-based management programs grant rights—sometimes in perpetuity, to a non-spatially delineated commons. He claims, "Individuals who will benefit from ITQs will be, not the families and crews embedded in local communities, but corporations or boat owners who, with guaranteed returns on investment, will consolidate ownership of quotas and transform the industry."¹⁴⁹

¹⁴⁸ T. Dietz, E. Ostrom, and P. C. Stern, "The struggle to govern the commons," *Science* 302, no. 5652 (December 12, 2003): 1907–1912.

¹⁴⁹ Kevin St. Martin, "Making Space for Community Resource Management in Fisheries," *Annals of the Association of American Geographers* 91, no. 1 (2001): 122–142.

St. Martin continues his discussion by highlighting that science, management and policy are frequently conducted and implemented on scales that do not match the social and ecological “spaces of fishing.” The scales used by management mismatch with the user’s scale because they were imposed onto vast oceans assumed to represent the commons. In reality, human and ecological communities occupy diverse spatial units. The conflict between fishers and managers in Port Orford exemplifies the dissonance created by spatial incongruencies. The current groundfish FMP assumes that West Coast groundfish are the “commons” which must be regulated by the state and turned into private property via the Trawl IQ Program to avoid the crisis of open access. However, the Trawl IQ Program has been implemented on the same coast-wide scale as other science and management, thus excluding small-scale, localized resource users such as the Port Orford fleet. Port Orford fishers cannot buy into the program because of corporate control and escalating prices. The community-based resource management projects in Port Orford support St. Martin’s claim that “there is evidence to suggest that communities...can even act as the basis for more formal forms of resource management that both avoid depletion of resources and sustain their equitable distribution.” St. Martin applies the theoretical criticisms of Hardin’s model and our subsequent management decisions to fisheries, illustrating why it is important to validate and recognize efforts of places like Port Orford, examples of communal property management.¹⁵⁰

A more recent article, “Achieving Sustainability in US Fisheries: Community Engagement in Co-Management,” written in 2008 by May, claims that the U.S. is moving towards a co-management model for fisheries and away from the lineage of traditional

¹⁵⁰ St. Martin, 122–142.

commons theorists who have built off Gordon and Hardin. Managing fisheries for sustainability rather than economic growth and efficiency became a renewed focus in national fisheries as late as the 1990's. Now, two decades later, the leadership is beginning to recognize that "legitimate regulation is more likely with decentralized management arrangements that give fishers, their organizations and their communities a clear stake in managing local resources..." as well as reducing costs and making the regulatory structure more appropriate to user groups. May borrows from Ostrom's theories in *Governing the Commons*, claiming that community governance structures can be stronger than government management because they are "based on local norms", "maintain the community and its cultural integrity", and "increase the effectiveness and efficiency of monitoring and enforcement."¹⁵¹ These benefits can be seen in emerging co-management projects. Quota-holding and loans programs in Sitka and Port Orford seek to maintain the normal structures of access to the resource found within the communities and preserve the vitality and independence of traditional fishing towns. Urchin monitoring partnerships between scientists and SDWFG members demonstrate successful and efficient monitoring, while Halmay's honor-based social code built around shore-side cooperation creates a non-traditional enforcement structure.

May cites community provisions in the 1996 and 2006 iterations of the MSA such as CDQs as promising examples of community co-management of fisheries, demonstrating newfound local awareness on the continuum of nation, regional and local management. CDQs have been successful, and the "community" designation from NMFS has been central

¹⁵¹ Candace K. May, "Achieving Sustainability in US Fisheries: Community Engagement in Co-Management" *Sustainable Development* 16, no. 6 (December 2008): 390–400.

to accruing benefits despite the fact that these programs were created by the existing top-down management regimes. No serious attempt has been made to spread the CDQ model beyond rural Alaskan communities, but more grassroots attempts—in places like Port Orford, Sitka, San Diego and Santa Barbara—are emerging and meeting with some success. May alludes to the presence of these developments, describing a situation where “the quiet revolution from below, augmented with the addition of formally recognized CDQ-like organizations, could have profound consequences for sustainability and governance from the local and global scale.”¹⁵² This “revolution” in management is gaining momentum at the local level among West Coast communities.

Hilborn also challenges the tragedy of the commons paradigm under which fishers are trapped in the role of users who exploit and degrade the commons despite privatization and regulation. Hilborn has been outspoken against the “litany of disasters” in fisheries, which perpetuates the idea that all management has failed and fisheries are doomed because of their common property nature. Hilborn claims that the “litany” of disastrous commons failures is invalid when one looks at examples of fisheries demonstrating two basic criteria: good governance and incentives. Though Hilborn does not specifically indicate community-level governance, this level contains transparency, appropriate scale of decision-making, and stakeholder participation. Organizations like the CFA board that Port Orford is developing are of the community and for the community and thus attuned to needs and adaptations. Incentives are critical to successful management, specifically dedicated access systems that exclude outside users. Under this requirement, fish stocks

¹⁵² May, 390–400.

are no longer the commons, but can be a context for communal property management. Examples of this include community-based fishing rights, Territorial Use Rights in Fisheries (TURFs), allocation to cooperatives, and individual fishing quotas. In places with strong government, government can set and enforce catch limits to maintain biological sustainability, but economic and social factors are compromised, whereas the maximization of all three factors is more feasible under dedicated access. Hilborn points to traditional examples around the world, ITQs with community measures in New Zealand and TURF management known as the Caleta system for shellfish in Chile.¹⁵³ New community fishing endeavors in the United States seek the support of state fish and wildlife departments and NMFS to promote dedicated access implemented at the community level.

c. Locating “Communities” within the Commons

Arguments in favor of diversifying the traditional understanding of fisher’s relationship with common-property fish stocks to include communal property management regimes become abstracted without locating the community within the matrix of the commons. If we are indeed expanding our understanding of commons resource management to include communities, it is important to locate examples of communities who are upending the narrative of the open access tragedy without privatization or state control.

Communities have historically been left out of fisheries management for myriad reasons. Defining fishing communities is difficult. St. Martin explains, “the reduction of agency to the individual subject—the “fisherman”—displaces to the periphery any role for alternative subjects, such as “the community,” to mitigate tragedy...the assumed

¹⁵³ Ray Hilborn., A. E. Punt, and J. Orensanz. “Beyond band-aids in fisheries management: Fixing world fisheries.” *Bulletin of Marine Science* 74, no. 3 (May 2004): 493–507.

homogenous commons makes any notion of an alternative space, such as community territory, equally foreign.” St. Martin blames the need to quantify and model the stocks and the behavior of fishermen for this displacement of other social institutions.¹⁵⁴ Our models depend on homogeneous settings, which marginalize and ignore heterogeneous community spaces.

Others identify the problematic absence of communities in traditional discourse. Norwegian fisheries scientist Svein Jentoft published in 2000, “The community: the missing link of fisheries management.” Jentoft holds that “vital communities are essential to vital fish stocks,” although this central thesis has been historically ignored. In 2000, he claimed that only “lip service” had been paid to community involvement, because fisheries management had remained a contract between a government and an individual. Management systems such as individual rights and restriction-based strategies like openers; vessel and gear restrictions increase competition between fishers and have not been effective in conserving stocks. These management systems “erode the social fabric that gives fishermen the potential to be stewards.” Jentoft advocates for the approach that is being pursued by community fisheries in the U.S.—a community-based co-management approach where users and regulators work in conjunction rather than in separation. He advocates for the community quotas of CDQs, CQEs, CSFs and RFAs rather than individual quotas.¹⁵⁵ Though community quota has been made available to CDQ and CQE communities in Alaska, community quota share is an elusive dream for groups like Port

¹⁵⁴ St. Martin, 122–142.

¹⁵⁵ S. Jentoft, “The community: a missing link of fisheries management,” *Marine Policy* 24, no. 1 (January 2000): 53–59.

Orford. Community quota organizations—fishing organizations working creatively to maintain access to the resource—are place-based, tied to the communities they represent. Place-based groups act as stewards, again demonstrated by local conservation initiatives such as the Sitka Sound LAMP. Gear-type is often also homogenous (i.e. longline, fixed-gear), though Jentoft argues that the geographic grounding is far more important than gear associations. The SDFWG exemplifies a united, place-based group made up of many gear-types. Jentoft echoes Ostrom in elevating co-management as a successful example of collective action.

The communities I have considered—Port Orford, Sitka and to a lesser extent, San Diego and Santa Barbara—are vastly different in their geographies, demographics, dependence on fishing, projects and areas of concern. However, all four are powerfully reinstating “community” in our discussion of resource management. The definition of community can be geographic and times relational, based on gear or other affiliations. Furthermore, the relationship of sub-communities, for example the fishing community within the larger population, or the community represented by the profiled fisheries organizations within the greater fishing community, is nuanced, complicated, and rife with conflicting motivations and ideas. However, there is no denying the role of these social ties in the future of fisheries. Port Orford, represented by POORT, has defined itself as a fishing community fighting to preserve its identity as a fishing town in the face of poorly conceived regulation. Sitka, represented by ALFA, defines itself as a community working to protect the future of independent, place-based fisheries. The small community of commercial fishermen in San Diego, represented by SDFWG, defines itself by its effort to restore fishing to a larger, diverse, urban community. Some Santa Barbara fishers feel represented by

CFSB, while others prefer independence. These places, organizations and the individuals they represent are leaders on the West Coast, working for a paradigm shift away from a traditional tragedy of the commons model to an updated, contemporary model that recognizes the benefits and opportunities possible within a communal property co-management regime.

II. Community-based fisheries co-management

a. Combining Terms

In researching communities, fisheries and management, one finds all combinations of the terms: community-based fisheries, community-based fisheries management, community co-management. Though these phrases are at times used interchangeably, they mean slightly different things. I have chosen to use the term “community-based fisheries co-management” (the lengthiest, of course) to describe the model I am interested in understanding and identifying. The term is really a combination of two distinct ideas. The first term, “community-based fisheries” describes a type of fishing fleet. A community-based fishery is generally one where most of the people who both fish out of a port and report landings at that port also live in the village, town or city where the port is located. Resident fishermen have strong and often multi-generation ties to their communities both on land and at sea. When discussing policy impacts on communities, a RAM staff member references fishing identity, “...many people in these small communities, they grow up in fishing families, this is a way of life, it’s not just a job.”¹⁵⁶ Representatives that I interviewed from all four locations echoed this sentiment. For example, in Port Orford, one

¹⁵⁶ RAM Staff, July 31.

is not considered a local unless one is at least a second generation resident.¹⁵⁷ Community-based fisheries are often “artisanal” fisheries. They are less industrial, and predominantly owner-on-board either by regulation or by default. Community-based fisheries are often characterized by boats that return to port more frequently and fishers subsequently demonstrate a stronger land-sea connection, compared to factory trawlers or catcher-processors that fish remote corners of the Exclusive Economic Zone that extends from three to 200 miles offshore and international waters. Companies not based in the communities where fish are landed often own these industrial boats. The longliners in Sitka, the hook and line and pot fishermen in Port Orford, and the many gear groups of San Diego and Santa Barbara (with the possible exception of those who fish highly migratory species) exemplify community-based fisheries. In conversations, you can hear notes of pride and connection among these local fishers. The issues they work on are relevant to the fishery and the industry itself, but also relevant in the context of the town where people live.

Non community-based fisheries are more typical in places like the Bering Sea, where companies such as Trident and Icicle Seafoods, whose corporate offices are located in Seattle, operate huge factory boats that do most of their processing at sea. Target species and location play a major role in establishing whether or not fisheries are community-based or not. In this understanding, I am referring to geographic rather than relational communities—the places where people live and work. Depending on the circumstances, it may be more appropriate to employ community-based fishing or a more commercial, industrial model. However, truly community-based fisheries are becoming

¹⁵⁷ Cobb, July 9.

rarer as corporations push out individuals and quota migrates out of communities as it becomes too expensive.

“Co-management” refers to the set of agreements and expectations by which the resource is managed. In the U.S., there have typically not been many co-management regimes. The Councils in conjunction with the federal government have typically governed ocean fisheries. State commissions have managed nearshore and anadromous species, unless they are declared an endangered species in which case control reverts to the federal government. Management decisions have been made at the top of the hierarchy and handed down to fishers with varying degrees of input and representation from different user groups. “Co-management” implies that community level actors (the fishers themselves) have a larger or primary role in data collection, stock assessment, management decisions, allocation, and enforcement with the oversight of state or federal regulators. Nowhere is this model better represented than in the collaborative urchin research of Peter Halmai and other urchin divers who collect measurements during harvest, and the partnerships between researchers and fishers in the nearshore in Santa Barbara. Co-management simply calls for a combination of bottom-up and top-down processes, in lieu of the primarily top-down approach that has historically occurred.

The two terms in combination create a new concept; community-based fisheries co-management describes small-scale, place-based fishing fleets that are seeking a larger role in managing their resource by working with the state or federal permit issuers, scientists, managers and Council members to carve out a place for community-level decision making and action. The term does not have a one-size fits all definition or a standardized set of criteria, but rather it is constantly evolving and updating its strategies and ideas. The

necessary baselines for successful implementation as well as the goals, expectations and anticipated outcomes of a community co-management approach have been delineated in various texts, but the mechanisms that define specific interpretations of community co-management differ between cases. What is important to fishers in Port Orford—fighting the groundfish IQ program to maintain access—may not be a priority for fishers in San Diego.

In his 1998 article, “A Process for Community-Based Fisheries Co-management” Pomoroy sets out to establish some baseline criteria for the concept, qualifying that, “There is no one model of co-management. Instead it should be seen as a process of resource management: adjusting and maturing to changing conditions over time and involving aspects of democratization, social empowerment, power sharing and decentralization.”¹⁵⁸ After making this qualification, Pomoroy lays out a general framework that he deems universally central to community-based co-management. Implementation of the model has four primary components: resource management, community and economic development, capability building and institutional support. Pomoroy later includes six steps characteristic to the implementation of co-management.¹⁵⁹ Here, his bias becomes apparent as most of his research was conducted in the Philippines. The implementation steps are very reminiscent of the process of any community development project in a third world country conducted in conjunction with international volunteers, scientists or NGOs—not a framework that translates particularly well to most American communities. Pomoroy’s bias reveals an important truth about academic research on the implementation

¹⁵⁸ Robert, Pomoroy, “A Process for Community-based Fisheries Co-management,” *Asian Fisheries Social Science Research Network*, no. 71–75 (January 1998). http://worldfish.catalog.cgiar.org/naga/na_1551.pdf.

¹⁵⁹ Pomoroy, “A Process,” 73.

of co-management regimes thus far—community-based co-management has been seen as a tool for managing resources in developing countries lacking strong governmental regulatory bodies. Pomoroy and St. Martin cite Pinkerton’s *Cooperative Management of Commercial Fisheries*: “examples of community management of fisheries have seldom been documented in the industrialized fisheries of the first world.”¹⁶⁰ Continuing, St. Martin writes, these examples are only “visible only in distant places or a distant past, communal forms of resource management are undermined as an option.”¹⁶¹ Strong examples come from the Pacific Islands and Chile where community co-management and access restrictions have been highly effective in preserving both the sustainability of fish stocks and fishing communities. Though the United States has a strong fisheries regulatory body, small-scale fisheries here are similar to artisanal fisheries in developing countries in scale and importance to the communities who rely on fishery resources.¹⁶² It is often these artisanal fisheries that are the most adversely impacted by top-down policy, building a case for co-management in these contexts.

In 2009, the Pacific Coast Federation of Fishermen’s Associations, an umbrella group that represents “working family fishermen,” developed a road map for CFAs. CFAs are the organizational manifestation of co-management. These entities, formed from parent fishing organizations like POORT design, implement and manage community-based management plans and communicate between users and regulators to work towards functional co-management. PCFFA also qualifies, “It is possible that the structure of community associations might differ markedly in each region, based on what criteria each

¹⁶⁰ Pomoroy, “A Process.” 71.

¹⁶¹ St. Martin “Making Space.”

¹⁶² Hilborn, July 17.

Council develops.” PCFFA and other groups around the country are currently working to help develop a national framework that would be broad enough to apply to every fishing community, but still flexible enough to allow communities to tailor the structure of an association to fit local needs. The document identifies that all CFAs will likely be responsible for: defining the community, establishing the purposes of the organization, designing the financial structure, naming the rights of the organization and of members, demonstrating transparency and oversight, establishing a working relationship with the Regional Fishery Council and avoiding violating anti-trust law.¹⁶³ “Proto-community fishing associations,” identified by the PCFFA, demonstrate promising associated effects including: developing new markets, protecting small ports and small-scale fishermen, maintaining infrastructure, attracting new entrants, building public support and possibly providing healthcare to fishers. Defining in absolute terms or writing a universal template opposes the central idea of community-based fisheries co-management; that organizational structures, management directives and relationships with state and federal regulators are defined by the community itself and are thus unique and varied.

b. Identifying Community Fisheries: Three Shared Components

In reading about community fisheries and learning about the developing projects that comprise the growing community-fisheries consciousness in Port Orford, Sitka, San Diego and Santa Barbara, I have identified three corners of community fisheries. The first component is access, rights and quota; the second is conservation and research

¹⁶³ Sara Randall, and Nate Grader. “PCFFA Fishermen’s News Column, March 2009: Community Fishing Associations.” *Pacific Coast Federation of Fishermen’s Associations*, March 2009. <http://www.pcffa.org/fn-mar09.htm>.

partnerships; and the third is direct-marketing sustainable products (Figure 2). All three of these components connect and reinforce each other, and are the focus of different degrees of emphasis in each location. Though different community-fisheries address these ideas differently, they are all actively seeking to address each idea.

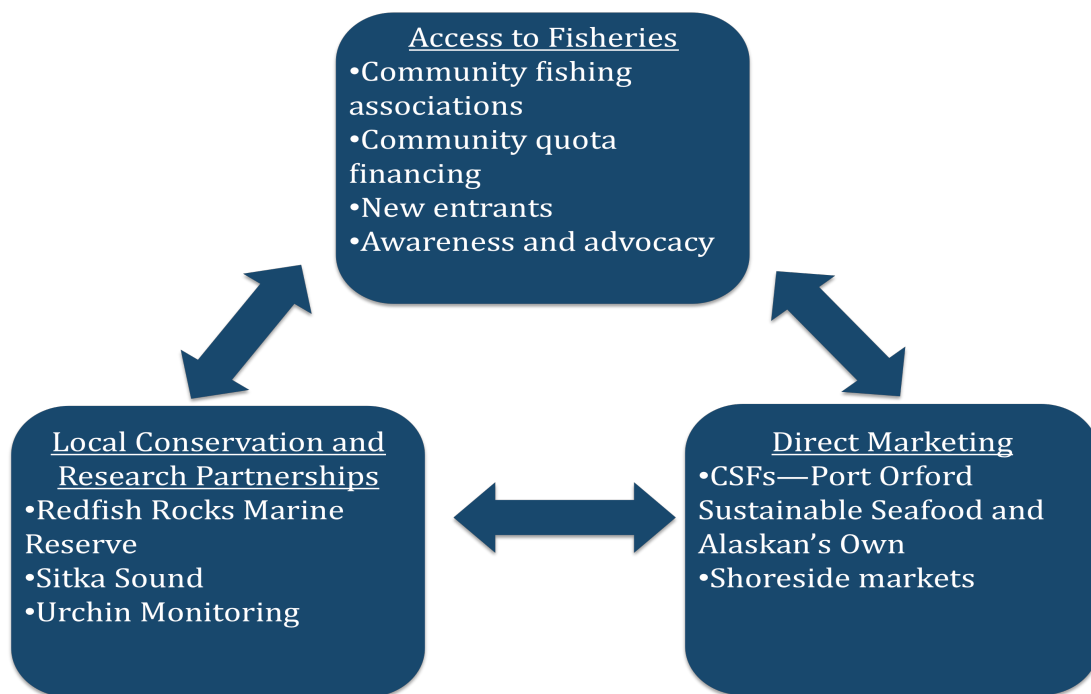


Figure 2. Illustration of the three corners of community-based co-management. Made by author.

The advent of widespread implementation of catch share programs recent years coupled with consolidation of fishing fleets and general migration out of small communities has resulted in dramatic shifts in the terms of access for current and future fishers in community-based fisheries. While many jump to criticize catch share for its adverse social impacts, the opportunity to hold community quota in conjunction with catch share programs creates a new opportunity for community-level organizing within policy. In Port Orford, the access question looms large as fishers have been excluded from the new Groundfish Trawl IQ program, slashing profits and jeopardizing the persistence of the local

fishing industry. Port Orford's CFA would ideally have a quota bank function, where participating fishermen enter a defined business development program under which they can lease quota share from the community allotment. Unable to purchase trawl IQ quota or state permits, the CFA faces significant obstacles before participants can feel confident in community access to the resource. Organizers remain optimistic, working with both the state and NMFS so that they have the opportunity in the future to hold quota as a community to save the businesses of current fishermen and ensure that new entrants have an existing industry to enter.

In Sitka, access is a primary concern for ALFA organizers, but the focus of the objective is directed towards access to the resource for future independent fishermen, as the Sitka industry has not seen the dramatic out-migrations of quota and consolidation visible in some neighboring fishing communities. Rather than seeking to create a CFA to hold quota like Port Orford, ALFA is focusing on guaranteeing access to the next generation of independent, responsible fishermen by providing affordable financing to enable entry level fishermen to buy costly quota share. The hope is that these fishermen are residents of Sitka or coastal Alaska communities and maintain the place-based nature of the industry for the next generation.

Though I spoke less directly with Peter Halmay of SDFWG about questions of access, he and his group face many access considerations. Those fishing groundfish have been impacted by trawl IQ and have concerns about access. Halmay is not, as far as I am aware, involved in developing plans for a quota bank or financing. In the past, major threats to commercial fishing in California come not from corporate-industrial fishing, but rather from environmentalists who are anti-fishing. Through long-term data collection

demonstrating a commitment to sustainability and consumer education through direct marketing, Halmay hopes that the environmental contingent will come around to support the continued access of independent commercial fishermen to sustainably managed food sources. Faced with a fishing community a fraction of its historical size, Halmay's priority is improving the industry so that fishers, who access the resources, remain viable.

Similarly, Jono Wilson is not aware of any direct quota financing attempts in Santa Barbara. The local fishing community is more concerned about physical access as the ocean gets partitioned for conservation goals.

Protecting the access rights of community fishery participants creates a communal property regime to be safeguarded through the social institutions of narratives of sustainable use and conservation. These narratives are built by self-designation of spatially explicit protected areas and the continuation and development of clean fishing practices. In Port Orford, the fishing community represented by POORT defines itself as conservation minded and sustainable. Before the idea to develop a CFA, Port Orford declared the Community Stewardship Area, within which community members must act responsibly to protect land and ocean. Within the Stewardship Area, organizers, fishers and scientists worked hard to agree upon a self-designated Marine Protected Area, the Red Rocks Marine Reserve, the first self-designated MPA on the Oregon Coast. POORT is involved in partnerships with scientists to measure the effectiveness of the MPA and mitigate bycatch. Defining the fishing community by a narrative of conservation and sustainability offers another form of resistance against trawlers who are the primary beneficiaries of the new distribution of the resource and labeled a "dirtier" fishery.

In Sitka, ALFA leader Linda Behnken galvanized the local fleet and worked with other Southeast Communities to promote conservation of the ocean environment, achieving a regional ban on trawling in 1998 in Southeast waters. Working on the sustainability of halibut resources on a finer scale, ALFA demonstrated impressive coordination between state and federal regulators and commercial and sport fishermen to close areas of Sitka Sound to halibut fishing other than subsistence due to localized depletions caused by heavy fishing pressure. In collaboration with the Fisheries Conservation Network, local fishermen test anti-whale depredation gear to reduce conflicts with marine mammals and report bycatch data to help minimize bycatch. FCN members are also involved in testing VMS gear to demonstrate a lower cost method of “observer” coverage. Federal regulators recognize the actions of community fishery members in Sitka for setting an impressive standard of local conservation and responsibility.

Establishing a verifiable narrative of responsible resource use and sustainable harvest practices is essential to direct marketing high value, “sustainable” fish products. Community Supported Fisheries (CSFs) are a new model being explored by community fisheries. POSS sells shares of the local catch to subscribers, educating consumers about fish preparation and testing markets for species traditionally considered “bycatch” to reduce pressure on heavily harvested stocks. Subscribers become engaged and active in fisheries issues, while perpetuating a local food system that brings fishermen higher profits. Higher profits to fishermen reduce the pressure to fish harder on stocks. The success of POSS depends on marketing a narrative of sustainability and local food.

In Sitka, ALFA also operates in conjunction with the CSF Alaskan’s Own. AO functions almost identically to POSS, providing shareholders in Sitka and Juneau with flash

frozen fish. AO privileges fishers involved in the FCN, prioritizing them in purchasing, perpetuating sustainability and reinforcing the story of a product harvested by stewardship-minded fishers.

In San Diego, Pete Halmay is playing to the strengths of his location in an urban area, choosing to pursue direct-marketing through a fish market rather than a CSF. Halmay hopes that the market will change the thinking of environmentalists and consumers to realize that the local fisheries are indeed being harvested sustainably by fishermen-scientists with an intimate knowledge and awareness about the conditions of the resource. Halmay also hopes that the market will reinforce cooperation within the gear types so that fishers will adhere to harvesting covenants. Direct marketing seafood on the dock at the harbor could provide a much-needed breath of life for the San Diego fishing industry. Also in California, the CSF Community Seafood in Santa Barbara has demonstrated commercial success during its first year.

Completing the linkages between the three components of community fisheries, a portion of higher profits from direct-marketed seafood can be directed towards financing access, used by CFAs to purchase quota share, finance new entrants or develop infrastructure that helps the industry persist. I have intentionally refrained from calling these three components the components of community-based fishery co-management. Some examples, such as the effort to create the Sitka Sound LAMP, demonstrate a co-management approach to shaping policy with the state and federal regulators. However, an explicit definition of the relationship and protocol between top-down and bottom-up management directives has not been defined for these community-fishing groups; the relationships are case-by-case depending on the issue and the other pressures on the

councils. Perhaps as community-based fisheries become more legitimized within our national framework, co-management protocols will be codified in MSA or in Council policy. Until then, community-based fisheries co-management is a developing process rather than an established paradigm. Identifying components common to developing community-based co-management regimes charts the development of a new management paradigm.

c. What factors Define Successful Co-Management?

Having established that co-management endeavors in the fishing communities of Port Orford, Sitka and San Diego and Santa Barbara are incomplete, I return to recent literature to examine factors significant to the success of community-based fisheries co-management. Ray Hilborn, and fellow fisheries scientists Gutierrez and Defeo published a paper in *Nature* in 2011 identifying factors important to successful fisheries. Gutierrez et al. open by asserting, "Using individual case studies, many have argued that community-based co-management should prevent the tragedy of the commons because cooperative management by fishers, managers and scientists often results in sustainable fisheries," despite the fact that evaluations of the successes of co-management are lacking. The paper cites other studies that concluded that co-management can cause:

Enhanced sense of ownership encouraging responsible fishing, greater sensitivity to local socioeconomic and ecological restraints, improved management through the use of local knowledge, collective ownership by users in decision making, increased compliance with regulations through peer pressure and better monitoring, control and surveillance by fishers.

Their study offers a meta-analysis using statistical techniques of a wide range of data sets to examine co-management situations worldwide. Gutierrez et al. identify leadership and social capital, catch shares including individual quota or community quota, and protected areas that are geographically bounded as the most important predictors of successful co-management based on a variety of measures categorized as ecological, social or economic.

The findings of Gutierrez et al. correlate strongly with my observations about successful aspects of community-based fisheries. Both Gutierrez et al. and Ostrom identify leadership and high social capital as important attributes of successful co-management models.¹⁶⁴ In conducting research in advance of interviews, it was very clear, even offsite, who were the most ideal people to interview within the fishing communities. Leesa Cobb, the director of POORT, demonstrated her passion and conviction fighting for the future of Port Orford as a fishing town. Her knowledge about policy is extensive and she is the driving force behind POORT's projects and Port Orford's visibility as an example of a community-based fishery working for co-management. ALFA director and longliner Linda Behnken possesses an informed dynamism. Her list of accomplishments improving the fishing industry in Southeast Alaska is lengthy, and she is recognized and respected throughout the fishing community for her work. However, when I sat down with Linda on the edge of the dock, petting her dog and listening to her stories, I was struck by how grounded and matter-of-fact she was as she prepared with her friends and crewmembers to go out for black cod. In San Diego, Peter Halmay is relentless in his quest to restore fishing to San Diego. As he gestured over the empty slips describing his dream of a daily fish market, I could imagine the scene easily and do not doubt that Peter can bring a resurgence of local fishing to the city of San Diego. I did not have the opportunity to meet the equivalent leader in Santa Barbara, but imagine that this person is equally dynamic. The strength of the organizational leadership of POORT, ALFA, SDFWG is apparent in the success of the attempts to protect access, practice conservation and benefit from direct marketing demonstrated by these groups. Strong leadership was central to these

¹⁶⁴ Nicolas L. Gutierrez, Ray Hilborn, and Omar Defeo, "Leadership, social capital and incentives promote successful fisheries," *Nature* 470, no. 7334 (February 17, 2011): 386.

endeavors. In speaking with others about the fisheries organization in Port Orford, Sitka and San Diego, the general sentiments about these individuals was, “if Leesa/Linda/Peter weren’t around...?” progress would be much slower. In accordance with the assessment of Gutierrez et al., strong leadership and a foundation of social capital appear central to organizing as a community fishery.

The second element of successful co-management is termed “catch share” by the paper, including individual quota as well as community quota in its assessment. Considering catch share as critical to success reintroduces the concerns about access and fishing rights faced by artisanal fishing communities against a backdrop of more industrial systems. Individual quota can allotments, like in the case of Port Orford, exclude fishers who do not receive an allocation based on historical landings or gear type. It can also produce effects of outmigration of quota from communities seen in Alaska. However, the authors suggest that catch share is critical because it is one way of achieving the exclusion of outsiders that Ostrom and others deem necessary to biological sustainability.¹⁶⁵ When government and policy are amenable, catch share provides a framework for communally controlled access rights in the form of community quota where these opportunities did not exist before. Reconsidering the experience of Port Orford in attempting to obtain community quota, it appears that government regulators must relax their definitions before catch share can be an opportunity rather than an obstacle for community-based fisheries on the West Coast.

The third predictor identified by Gutierrez et al. is the existence of geographically bounded protected areas. In my research, I found that the existence of protected areas

¹⁶⁵ Ostrom, “Struggle.”

under partial community management was one of the primary indicators of a community-based management regime. In Port Orford, both the community stewardship area and the Redfish Rocks Marine reserve stand as examples of the importance of protected areas to the sustainability of local stocks but also to the identity of the members of the fishing community as empowered stewards of their local environment. Similarly, the Sitka Sound LMP and the ban on trawling protect both highly localized and regional stocks. The active role that ALFA took in establishing these measures helped established Sitka as a regional example for community-based fisheries co-management. In San Diego, Halmay's long-term data set and urchin advocacy protected the resource from extermination by misinformed state managers and irresponsible harvest due to lack of regulation. Partnerships with scientists have helped devise appropriate surveying and fine-tuning of harvest so that the resource functions effectively like a protected area that allows responsible harvest rather than depending on complete exclusion. Fishers and scientists hope to produce more effective catch limits for Santa Barbara stocks using collaborative research and simple modeling. Developing community-based fisheries co-management examples on the West Coast align with global analysis on co-management conducted by Gutierrez et al. by affirming the vital importance of leadership and social capital, catch shares and protected areas.

d. Revisiting the Commons

Since publication, Hardin's "Tragedy of the Commons" has been under constant reevaluation and revision, with many authors finding fault with its deterministic simplicity. Nobel Laureate Elinor Ostrom has been one of those people, publishing extensively on natural resources and the commons. In her heavily cited 2003 article in *Science*, "the

Struggle to Govern the Commons,” Ostrom identifies five primary purposes that are necessary for new-school effective commons governance. Communal property resources identified by Feeny et al. function like limited commons resources, thus community-based co-management structures should align with Ostrom’s re-evaluation. Ostrom claims that governance structures must: provide necessary information; deal with conflict; induce rule compliance; provide physical, technical and institutional infrastructure; and encourage adaptation and change.

In terms of providing information, community-based fisheries co-management offers the opportunity to provide both fine-scale data made possible by localized data collection with larger trends identified by coast wide stock assessment regimes. This partnership is demonstrated by Peter Halmay’s urchin dataset—without involvement from the fishing community, transect information micro-grids would not exist and harvests could not be as finely managed. Research projects like Jono Wilson’s, assessing the full impact of conservation on species and fishers, provide critical information. Fisheries organizations, particularly CFA boards with members representing all user groups, are ideally placed to mitigate potential problems with exclusion and allocation. In an ideal world, Regional Fishery Councils could serve as the venue for inter-community disputes to be resolved, although based on the experience of Port Orford, the Councils do not remain objective and can be dominated by one interest group over another. In this case, coast-wide trawl interests superseded the complaint brought by the smaller, localized fixed gear sector. Social pressure, incentives such as opportunities to sell to direct market and benefits from community quota programs with stewardship criteria, coupled with federal and state oversight, ensure compliance with rules and regulations such as bycatch

limitations and TAC limits. Examples of infrastructure provided at the community level include VMS and other experimental, advantageous gear testing. Infrastructure provided at the governmental level might include harbor maintenance, which Port Orford has notably not received and is jeopardizing their entire organizational effort. Ostrom's final requirement, that governance structures encourage adaptation and change, is most easily satisfied at the community level, for organizations comprised of community members with an immediate stake in the resource in question are well-positioned to adapt to community needs. In theory, councils with stakeholder input are also adaptable, although national policy tends to adapt slowly. In terms of national policy, the MSA and its application by NMFS appears to be slowly moving away from the traditional management regime based on a "tragedy of the commons" model that necessitates government regulation and privatization of fisheries, the transition aided by studies such as the one conducted by Gutierrez et al. in conjunction with re-theorizing by thinkers like Ostrom.

Conclusion

Institutional fisheries management in the United States is relatively young. The current MSA looks significantly different in its goals and strategies for managing fisheries than the first iteration of the law in 1976. The MSA is again up for reauthorization in 2013. As fisheries management evolves, it remains important to understand the historical and social contexts for regulation. When the United States first introduced fisheries management, Hardin's "Tragedy of the Commons" loomed large for natural resource managers. Foreign vessels were decimating unregulated fisheries. Following "commons" thinking, we introduced governmental regulation to restrict the commons. When these measures proved ineffective, we appealed to private property in the form of individual quota to save some national fish stocks. While many of these programs have successfully eliminated overfishing and made fisheries more economically efficient, fishing communities have suffered, continually viewed as user groups lacking the agency to manage resources with which they are intimately connected. Fishing communities along the West Coast are beginning to demand greater a greater role in managing localized resources, turning to models of community-based fisheries co-management to give credence to local knowledge and demand a balance between top-down and bottom-up regulation. The emerging stories and strategies are creative and inspiring; the fishing communities of Port Orford, Sitka, San Diego, Santa Barbara and other examples I did not include are working through local fisheries organizations to preserve access, practice local conservation and research and direct market sustainable seafood, while demanding greater support from federal and state regulating bodies who profess to support these emerging models. The development of community-based fisheries co-management represents

nothing less than a new paradigm for natural resource management. Under this emerging paradigm, the new commons is a space where communal fisheries property can be managed for ecological, economic and social sustainability.

Appendix 1: List of Included Interviews

Interview 1:

Ray Hilborn, Professor of Fisheries Science

Interview recorded and transcribed by Charlotte Dohrn

Location: UW Fisheries Science building, Seattle, WA

Date: July 17, 2012

Interview 2:

Anne Hollowed, Program Director AFSC

Interview recorded and transcribed by Charlotte Dohrn

Location: AFSC office, Seattle, WA

Date: July 19, 2012

Interview 3:

Libby Logerwell,

Interview recorded and transcribed by Charlotte Dohrn

Location: AFSC office, Seattle, WA

Date: June 6, 2012

Interview 4:

Teresa A' mar, Stock Assessment

Interview recorded and transcribed by Charlotte Dohrn

Location: AFSC office, Seattle, WA

Date: June 15, 2012

Interview 5:

Leesa Cobb, Executive Director of POORT

Interview recorded and transcribed by Charlotte Dohrn

Location: POORT office, Port Orford, OR

Date: July 9, 2012

Interview 6:

Megan Mackey, Fisheries Policy Associate

Interview recorded and transcribed by Charlotte Dohrn

Location: Ecotrust office, Portland, OR

Date: June 26, 2012

Interview 7:

Lyle Keeler, POORT Fishermen's Board

Interview recorded and transcribed by Charlotte Dohrn

Location: POORT office, Port Orford, OR

Date: July 12, 2012

Interview 8:

Kean Fleming, Port Orford CFA Organizer
Interview recorded and transcribed by Charlotte Dohrn
Location: POORT office, Port Orford, OR
Date: July 10, 2012

Interview 9:

Stephanie Webb, POSS CSF Director
Informally interview not recorded, adapted from notes
Location: POORT office
Date: July 9, 2012

Interview 10:

Aaron Longton, Fishermen's Board Member, POSS Director
Interview recorded and transcribed
Location: POORT office
Date: July 9, 2012

Interview 11:

Linda Behnken, Executive Director ALFA
Interview recorded and transcribed by Charlotte Dohrn
Location: A&B Harbor, Sitka, AK
Date: July 25, 2012

Interview 12:

Natalie Sattler, Director Alaskan's Own
Interview recorded and transcribed by Charlotte Dohrn
Location: ALFA office, Sitka, AK
Date: July 24, 2012

Interview 13:

Jeff Farvour, Megan, Walter, ALFA members
Group interview not recorded and adapted from notes
Location: A&B Harbor, Sitka, AK
Date: July 25, 2012

Interview 14:

RAM Staff
Group interview recorded and transcribed by Charlotte Dohrn
Location: RAM offices, NMFS, Juneau, AK
Date: July 31, 2012

Interview 15:

Peter Halmay, Director SDFWG
Interview recorded and transcribed by Charlotte Dohrn

Location: Driscoll Harbor, San Diego, CA
Date: October 6, 2012

Interview 17:

Jono Wilson, Fisheries Researcher
Interview recorded and noted by Charlotte Dohrn
Location: Phone
Date: October 2, 2012

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