

Promoting resilience in a regional seafood system: New England and the Fish Locally Collaborative

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Abstract This article explores problems and solutions in the New England groundfish fishery, where social, economic, environmental, and food system sustainability are major challenges. With industrialization of fishing during the past century, managers have turned a blind eye to issues of scale (e.g., industrial scale vs. community scale), which has led to chronic overfishing. There have been recurring stock collapses of favored species (e.g., cod) during the past 50 years despite federal government management of the fishery during most of that period. Small- and medium-scale fishermen—with better local knowledge, motivation for local sustainability, and smaller ecological footprints—have increasingly been displaced by large-scale operations, especially during recent years with policies that are privatizing fisheries access and consolidating the fleet. Coastal fishing communities and the fishery have suffered. The Fish Locally Collaborative (FLC)—an international decentralized network of fishermen and their allies—is promoting a paradigm shift. Its efforts to keep the smaller-scale boats afloat and support local communities include economic and political strategies. Defining value with quadruple bottom line accounting (i.e., assessing social, economic, environmental, and food system impacts), the FLC promotes a shift from high-volume/low-value production to low volume/high value. The FLC has reestablished local food supply chains with community-supported fisheries, public seafood markets,

and “boat-to-hospital” and “boat-to-school” programs based on procurement contracts that specify local and sustainable catch. FLC participants promote the consumption of lesser-known fish species to motivate more balanced and ecologically sustainable fishing. Politically, FLC participants continue to build the strength of the network and engage in policy discussions at local, national, and international levels.

Keywords New England · Fisheries · Cod · Sustainability · Resilience · Regional fisheries council · Community-supported fisheries · Catch shares · Fish Locally Collaborative

Introduction

Fisheries around the world are facing increased pressure from industrial fishing, pollution, habitat destruction, climate change, and the global market. New England’s groundfish fishery is no exception. Fishing has become increasingly industrialized to take advantage of economies of scale, i.e., high-volume/low-value production. This approach leads to a non-resilient seafood system because it undermines ecosystems (high-volume fishing pressure) and local economies (low price paid to the fishermen and smaller-scale operations going out of business). It also reduces accountability and transparency to the public. Local seafood supply chains are broken—fishermen have no idea where their catch goes, while coastal communities do not have access to what is being caught locally and are unaware of the ecological, social, and economic implications of their seafood choices.

The Fish Locally Collaborative (FLC), a non-hierarchical network of local fishermen that relies on relationship building and knowledge sharing, is countering the dominant system with economic and political tactics. It started in Maine and now spans the globe. Community-based fishermen and their

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allies are building stronger connections, aligning around shared values, and taking action to promote a resilient fisheries model—healthier marine ecosystems and community-based fisheries. Economically, the FLC creates local supply chains and aims to replace the high-volume/low-value model with one of low volume/high value, where value is measured not only as economic value but also as social, ecological, and food system values. Politically, the network's purpose is to have a more effective voice in policy and management decisions. Over time, the FLC aims to increase opportunity for ecologically sound fishing and to create more resilient regional seafood systems.

This paper focuses on the New England groundfish fishery as a case study. We begin with a brief description of the setting, followed by a history of the fishery and its resilience challenges, including recurrent collapses of the most-favored fish stocks. After summarizing the problems and outlining a proposed paradigm shift for a healthy fishery, the relevant work of the FLC network is presented. This case study is meant to inspire policy makers, advocates, and researchers.

Setting

The area being considered here is federally controlled waters off New England—3 to 200 mi from the shores of Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut (Fig. 1). This area includes the following subzones: Georges Bank, Gulf of Maine, Southern New England, Mid-Atlantic, and Cape Cod.¹ The fishing fleet's boat sizes are typically categorized as small (<50 ft long), medium (50–75 ft), and large (>75 ft). Small and medium boats are located all along the coast, while large boats are concentrated in major port cities. Some fish exclusively inshore or offshore, but the largest portion fishes both. The fleet includes full-time, part-time, and occasional fishermen (NEFMC 2010).

Fishing in this area is governed by the New England Fishery Management Council (NEFMC), which is federally mandated and answers to the National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration (NOAA), within the US Department of Commerce. The NEFMC has developed ten different fishery management plans, one of which is the Northeast Multispecies (Groundfish) Fishery Management Plan. The Groundfish Plan specifies management measures for 15 groundfish species: cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, redfish, ocean pout, red hake, offshore hake, and silver hake (NOAA n.d.a). The plan recognizes separate stocks of cod, haddock, and the various flounders in each subzone.

¹ The Northwest Atlantic Marine Alliance believes that more subzones are necessary to accurately reflect distinct groundfish habitats, based upon the research of Ted Ames and the Penobscot East Resource Center.

History

Early development (pre-1900)

Fishing in New England dates back thousands of years. Indigenous communities along the coast relied heavily on seafood long before European settlement. Traditional methods of fishing were passive and operated at a very small scale. Some of those methods, such as weir traps, are still used today.

As early as the sixteenth century, European fishing vessels were able to cross the Atlantic Ocean in pursuit of fish. Explorers marveled at the abundance of cod, claiming that they were so thick that it made rowing difficult, and a wicker basket hung over the side of the ship would come up full (Brown 2003). European settlement in New England displaced indigenous communities from their traditional fishing grounds. This was the beginning of fisheries access being taken from those who fished with the smallest ecological footprint.

By the seventeenth and eighteenth centuries, cod had become a major commodity. The cod fishery led to trade networks and local economies built around landing, processing, and distributing fish. During that time, the fishing methods were still fairly simple. The boats were typically around 25 ft long and powered by oars; some used a combination of both sail and oars ("row-sail" boats). In the nineteenth century, technology advanced to the point where boats had the ability to process fish onboard (NOAA n.d.b).

Schooners (large sailboats) loaded dory boats (small rowboats) onboard and transported them out to the fishing grounds, released them to fish multiple areas for the day, and then picked them up once the boats were full. This marked one of the first steps toward industrialization (Gibson and Boeri 1976).

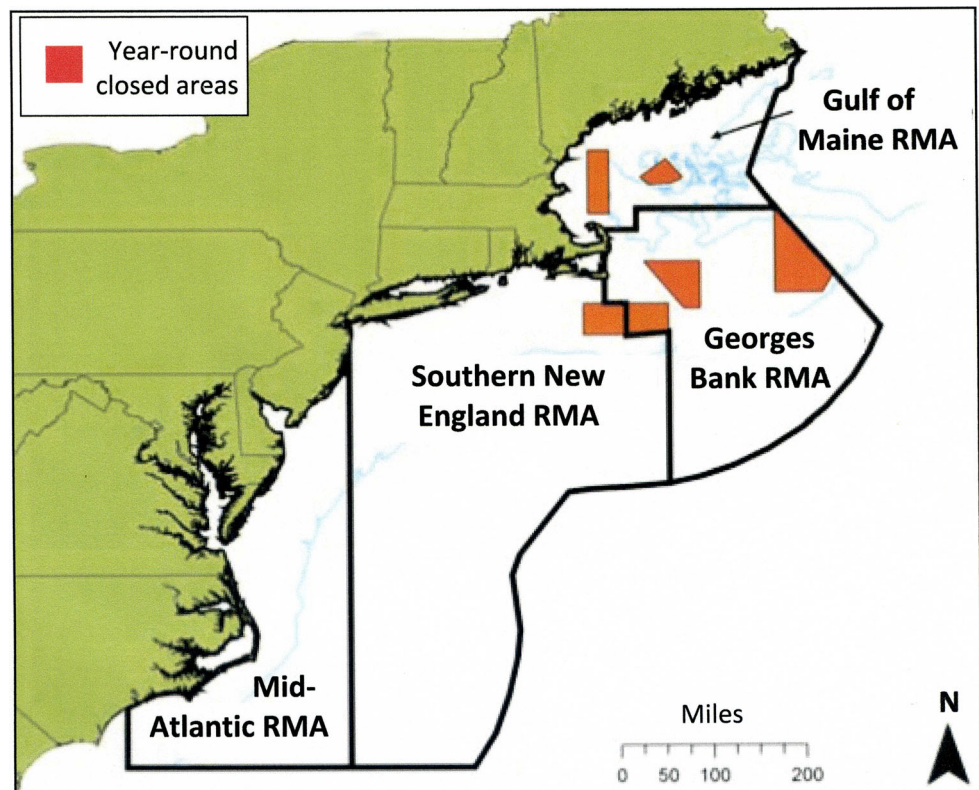
As fishing economies sprouted around coastal communities, various local and state jurisdictions and territorial laws governed fisheries access. In 1878, the US government established the first "Fish Commission" located in Gloucester, MA, to support the fishing industry. The initial focus was to study fish populations and seafood technology (NOAA n.d.b).

Industrialization (1900–1976)

Groundfish were caught exclusively with sailboats and baited lines until 1906, when steam-powered trawlers (boats that pull large nets) were introduced. This marked the end of the schooner era and the beginning of an era in which fishing efficiency challenged the resilience of fish stocks (NEFSC n.d.).

Haddock replaced cod as the main target species in 1920–1930. The development of the fish filet and new freezing methods meant that even Americans in the interior could enjoy Atlantic groundfish. But, haddock landings plummeted as the fish stock was increasingly stressed. In 1930, scientists at Harvard University were asked to study the decline and recommend conservation measures. They recommended

Fig. 1 Subzones in New England fishing areas under federal government jurisdiction. *RMA* regulated mesh area. Source: NOAA (2015)



increased fishnet mesh sizes, because the Boston fleet had landed 37 million haddock while discarding 70–90 million dead baby haddock at sea. This recommendation was not implemented until 1953 (NEFSC n.d.).

Gasoline-powered boats hauling in fishing nets with mechanized drums appeared in the area around 1930. Soon thereafter, new navigation and communication devices, as well as many other forms of maritime equipment (e.g., depth sounding and radar), were used by commercial fishing vessels. As this technology became more accessible to average fishermen, their range and mobility for fishing increased as well. Competition also flourished, forcing fishermen to invest more into their boats and equipment in order to stay up to date with the current technology (NOAA n.d.b).

In 1954, the first factory trawler (a very large ship with on-board processing facilities), the Scottish vessel *Fairtry*, fished for cod in the waters off the Grand Banks (Newfoundland). This ushered in the gravest threat yet to the sustainability of the fishery: the era of factory fishing. At 280 ft long, the *Fairtry* was more than four times the size of the largest trawlers in the area (Brown 2003).

The number of foreign factory trawlers fishing off US shores grew steadily over the next two decades. “By the 1970s, the Soviets had 400 factory trawlers, the Japanese had 125, Spain had 75 and France and Britain had 40. And the trawlers were getting larger, exceeding 8,000 t in weight” (Brown 2003). Along with the US and Canadian fleets, these boats caught high

volumes of fish in short amounts of time. Not only cod, but also stocks of other groundfish such as flounder, halibut, and haddock were decimated. The scale of fishing pressure increasingly disrupted the natural cycles of fish migration, spawning, and aggregation. Pressure was too great for the ecosystem to withstand, and fisheries began to collapse in New England.

At that time, US states and regions had rules and regulations to protect fish spawning and habitat. However, as fishing boats became more mobile, the ability for states and regions to effectively enforce regulations became increasingly problematic. The federal government had moved its Fisheries Bureau to the Department of Commerce. Rather than serving a regulatory purpose, it focused on fisheries studies, research, market development, and improving technology (NOAA n.d.b). In 1970, the National Oceanic and Atmospheric Administration was formed, and within it, the Bureau of Commercial Fisheries became the National Marine Fisheries Service. They remain today under the Department of Commerce.

New management models (1976–1995)

In 1976, in response to the foreign factory trawlers overfishing the grounds near the USA, Congress passed and the federal government implemented the Magnuson Fisheries Conservation and Management Act (now known as the Magnuson-Stevens Act (MSA)), which established a 200-mi exclusive economic zone. The MSA also created eight regional fishery

management councils tasked with managing the fish stocks to maximize yield while preventing overfishing. The New England Fishery Management Council (NEFMC) developed the region's fisheries management policies guided by a set of ten national standards, including socioeconomic considerations. NEFMC receives annual estimates of maximum sustainable yield for each species from scientists at NMFS and local science centers and must devise regulations to avoid exceeding the catch limits in order to maintain sustainability.

The MSA effectively evicted the foreign vessels. But, instead of allowing fish stocks to recover, the US government adopted various incentive programs to “scale-up” the domestic fleet, essentially creating miniature versions of the factory trawlers. Federal programs financed the construction or reconditioning of 291 fishing vessels in the Northeast, at a cost of approximately \$128 million to taxpayers (Crocker 2008). This quickly transformed what was once a smaller-scale domestic fleet, into increasingly larger-scale businesses, and introduced the absentee owner, an investor more interested in turning a profit than deriving a livelihood from the sea. Between 1977 and 1986, the fleet's fishing capacity more than doubled. The Northeast Fisheries Science Center calls this the “second industrial revolution” (NEFSC n.d.).

NEFMC's first Groundfish Plan was adopted in 1977. It relied on hard quotas (total allowable catches (TACs)). Once the TAC for a certain species was reached, fishing for that species had to stop. In some instances, the approach led to a “race for fish,” as fishermen tried to catch as much as they could before the limit was reached. This led to very short fishing seasons and did not actually stop overfishing. Moreover, a rule regarding possession limits inadvertently led to a huge amount of waste. One fisher recalls, “It seemed like for every 500 lb of flounder we caught we had to dump 1,000 lb of haddock overboard” (Crocker 2008, p. 20).

Some fishermen suggested solutions to avoid discards and protect the fish stocks, while others argued that any change would mean economic hardship. Often catch limits were simply raised to avoid closing the fishery. This was in part due to wording in the MSA, which defined optimum yield as the scientifically estimated catch limit, “as modified by any relevant economic, social, or ecological factor” (Crocker 2008). Thus, overfishing could be justified with economic (and political) considerations. As one exasperated scientist said, “They knew that the stocks were in trouble but decided not to restrict the fishing because the fishermen continually said they would go out of business” (Crocker 2008, p. 26).

The quota system was abandoned in 1982 and replaced with various “effort control” measures, such as number of days at sea, minimum fish sizes, gear restrictions, and closed areas (NEFMC n.d.a). Still, fishing regulations did not effectively address the risk of overfishing, and the volume of commercially harvested seafood boomed in the 1980s. The same problem caused by foreign factory trawlers during the 1950s–

1970s was repeated during the 1980s, when fishing pressure from the domestic fleet became greater than the fish stocks could handle. One by one, many of the most productive stocks collapsed—cod, haddock, yellowtail flounder, redfish, American plaice, and witch flounder. This caused groundfish landings to plummet (Fig. 2). The annual economic loss was estimated at \$349 million in income, \$41 million in consumer benefits, and 14,300 person-years of employment (Hoagland, Kite-Powell, and Schumacher 1996).

In 1993, NEFMC implemented a steep reduction in allowable days at sea for each vessel, but this mainly encouraged boats to concentrate their efforts in inshore areas (Crocker 2008). Managers encouraged fishermen to devote themselves to other fisheries—such as lobster and herring—in response to reduced groundfish catches and even invited into the region a factory herring fleet. Local fishermen expressed their concerns:

- The factory herring fleet created ecologically unsustainable competition for those traditionally fishing for herring.
- Herring are preferred food for groundfish, so industrial-scale removal of herring threatened to compromise the recovery of groundfish.
- Industrial herring vessels are known to catch juvenile groundfish, which meant there were fewer fish growing old enough to spawn and sustain the population.

The fishermen's foresight fell on managers' deaf ears.²

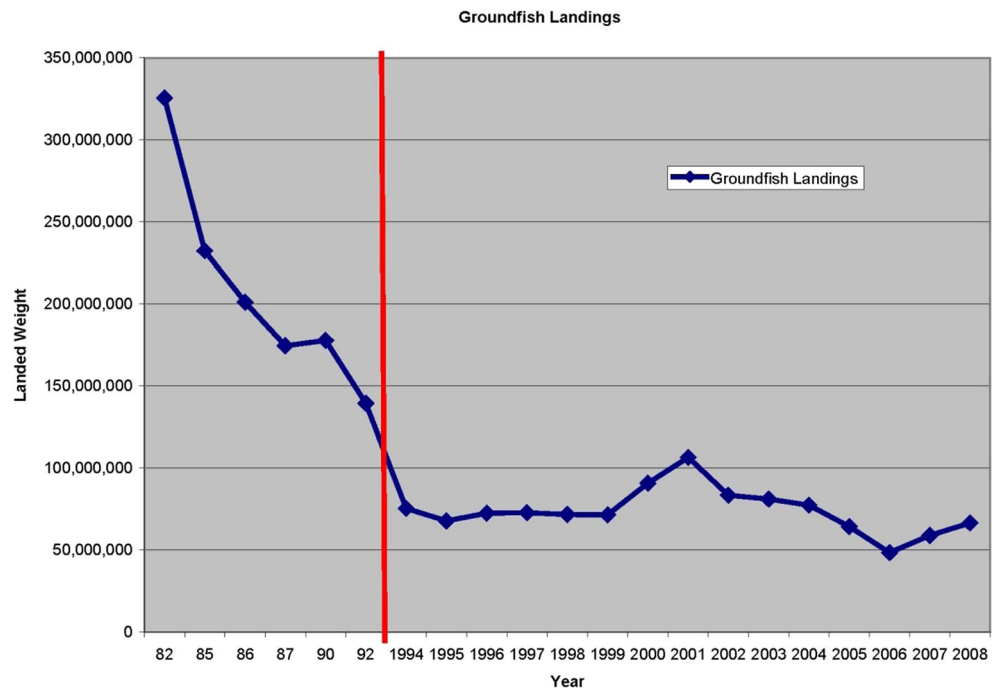
Rebuilding (1995–2010)

In 1995, NMFS stepped in and imposed “rolling closures” that coincided with cod spawning periods in New England's coastal waters (Crocker 2008). This was the beginning of rebuilding, and fishermen saw a resurgence of fish stocks during the next 15 years. According to NRDC (2013), the collapse of groundfish populations in New England during the 1980s galvanized support for significant changes when the MSA was reauthorized in 1996 (and renamed the “Sustainable Fisheries Act”). One change was in the definition of “optimum yield.” Instead of maximum sustainable yields being “modified” by economic, social, or ecological factors, they can only be “reduced” by these factors, so exceeding the scientifically estimated sustainable yield is no longer permissible (Crocker 2008).

The new MSA also required each regional council to develop plans to end overfishing and rebuild stocks that had been overfished. NMFS began issuing “status of stocks” reports in 1997. Unfortunately, fishermen catch a variety of species at once, and it is impossible to design effort control measures in a completely selective manner for individual species (NEFMC n.d.a). But, considerable progress was made, and New England groundfish stocks began to recover during

² Niaz Dorry, Draft proposal for Andrus Family Fund, October 23, 2008.

Fig. 2 New England groundfish landings (in lb), 1982–2008. Source: NEFMC (2010)



the late 1990s (Fig. 3). Table 1 shows the estimated catch reductions still necessary for rebuilding as of 2009.

Privatization and consolidation (2010–present)

In 2010, NEFMC adopted Amendment 16 to the Groundfish Plan, which introduced a “Catch Share” policy that made fishing rights tradable. NEFMC set strict allowable catch limits and divided the allowable catch into quotas (known as annual catch entitlements (ACE)) among fishermen, vessels, and corporations based on their catch histories. Quota owners can fish up to the allotted amount, or they can lease or transfer their quota or sell their entire permits. Thus, although they are technically revocable permits, fishing rights became a private market commodity. Like a cap-and-trade system, the idea is to set a firm limit and “let the market take care of it.”

Catch Shares are very controversial.³ While initially creating “overnight millionaires” by privatizing what was once public property, the most conspicuous consequence of Catch Shares is rapid consolidation of the fishing fleet and a steep decline in the number of small boats. Large fishing companies, whose primary goal is immediate profit rather than sustainable use, have the capital to buy or lease quota and gain control over the entire fishery⁴ (Food and Water Watch 2011; Rust 2013; van der Voo 2014).

³ In 2007, the United Nations Human Rights Committee ruled in the case of Iceland that privatized Catch Share systems violate international law and the human rights of fishermen. The Catch Share system was dismantled (Food & Water Watch 2011).

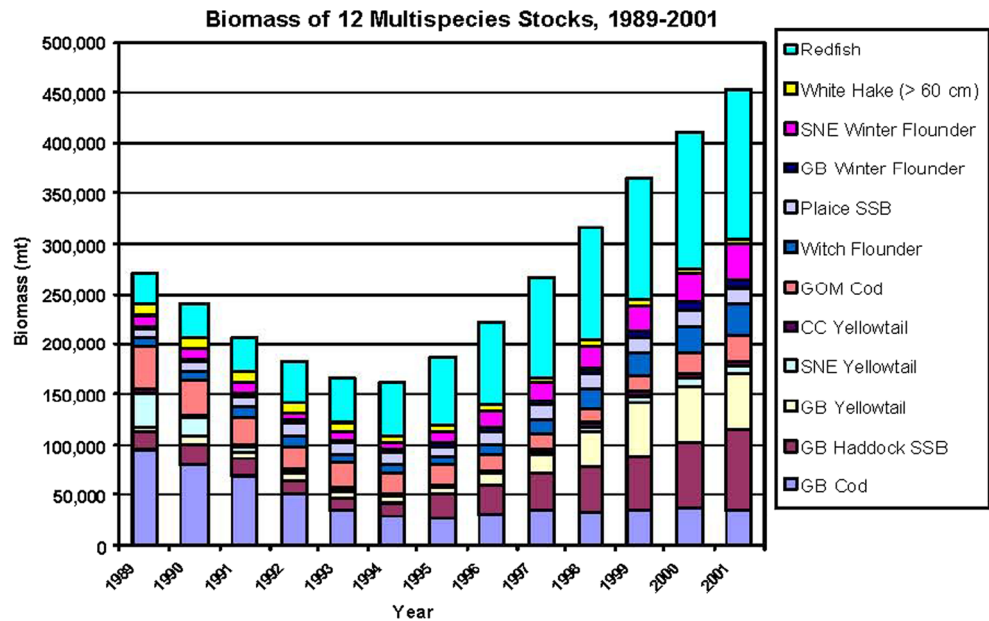
⁴ Except in some North Pacific fisheries, where corporate ownership is not allowed (Brinson and Thunberg 2013).

Resistance from a coalition of fishing communities and small- and mid-scale fishermen and environmental groups including Greenpeace had led to a 1996 Congressional nationwide moratorium on new Catch Share programs until NMFS could more adequately investigate the potential negative social impacts of the strategy. New England fishermen had strongly resisted efforts to institute Catch Shares, and when the national moratorium was lifted in 2002, an exception for New England stipulated that a referendum would have to be conducted with two thirds of the permit holders approving before a Catch Share program could be established in the region.

No referendum was held, however, because the NEFMC devised a system of “sector management” that avoided the “Limited Access Privilege Program” designation, yet still served to privatize and consolidate fisheries access (Tolley and Hall-Arber 2015). The New England groundfish “sectors” are groups of three or more vessels that together submit an operation plan for NMFS approval each fishing year (NEFMC 2009). In 2011, there were 19 sectors comprising 781 permits (56 % of all permits) and accounting for 99 % of the annual catch limit for the entire groundfish fishery. Three of the sectors were formed by companies as lease-only sectors; i.e., they had no intention of fishing and were only making money from leasing their quota (Brinson and Thunberg 2013).

Amendment 16 also established an elaborate monitoring program, including electronic monitoring as well as professional observers dockside and at sea. This helped solve the long-time problem of enforcement, but the program is scheduled to soon become entirely industry-funded, at a cost that

Fig. 3 New England groundfish stocks during 1989–2001. Source: NEFMC (n.d.b)



might exceed the profit margins of small- and medium-scale boats.

The number of active vessels in the New England groundfish fishery declined rapidly, from 612 in 2009 to 420 in 2011.

This fleet reduction represents consolidation, not decreased fishing effort. Revenue per vessel increased from \$203,000 to \$375,000 between 2009 and 2011 (Brinson and Thunberg 2013). In the first year alone, landings for the largest-scale

Table 1 Summary of reductions in fishing effort needed to achieve fishing mortalities for rebuilding stocks

Species	Stock	2007 Fishing mortality	Targeted fishing mortality (either $F_{rebuild}$ OR 75 % of F_{MSY})	2008 F from 2008 Estimated catch	% Change in F necessary to achieve targeted mortality (%)	% Change in exploitation (%)
Cod	GB	0.300	0.184	0.410	-55	-50
Cod	GOM	0.456	0.18	0.300	-40	-37
Haddock	GB	0.230	0.26	0.079	229	202
Haddock	GOM	0.350	0.32	0.250	28	24
Yellowtail flounder	GB	0.289	0.109	0.130	-16	-15
Yellowtail flounder	SNE/MA	0.413	0.072	0.120	-40	-39
Yellowtail flounder	CC/GOM	0.414	0.18	0.289	-38	-34
American plaice	GB/GOM	0.090	0.14	0.099	41	39
Witch flounder		0.290	0.15	0.296	-49	-46
Winter flounder	GB	0.280	0.20	0.131	49	48
Winter flounder	GOM	0.417	N/A	Unk	n/a	Unk
Winter flounder	SNE/MA	0.649	0.000	0.265	-100	-100
Redfish		0.005	0.03	0.008	275	271
White hake	GB/GOM	0.150	0.084	0.065	29	28
Pollock	GB/GOM	10.464	4.245	15.516	-73	-73
Windowpane	GB/GOM	1.960	n/a	n/a	n/a	n/a
Windowpane	SNE/MA	1.850	n/a	n/a	n/a	n/a
Ocean pout		0.380	n/a	n/a	n/a	n/a
Atlantic halibut		0.065	0.044	0.060	-27	-26
Atlantic wolffish		Unk		Unk	n/a	

Source: NEFMC (2009)

GB Georges Bank, GOM Gulf of Maine, SNE Southern New England, MA Mid-Atlantic, CC Cape Cod

fishing businesses increased 10 %, landings for the smallest-scale boats decreased by more than 50 %, and 165 crew jobs were lost. Non-owner-operator companies became more dominant, and one company now controls 23 % of the annual allowable catch for winter flounder (NAMA n.d.).

Despite cautionary tales from other fisheries with Catch Share programs, measures to preserve fleet diversity and avoid excessive accumulation of quota were not considered by NEFMC until September 2010 (NEFMC 2010). An increasing number of New England fishermen, council members, and others expressed their opinions on the problems associated with Catch Shares, offering solutions including limits on quota accumulation in line with the MSA National Standards, safeguards for inshore fishing areas, fleet diversity, and more transparency on ownership trends. This led to the drafting of Amendment 18 to the Groundfish Plan, which became an object of intense discussion (NEFMC 2014).

Despite renewed efforts to adhere to scientifically recommended catch limits, the new system has a fatal flaw: Sector operation plans do not genuinely improve the methods or approach to harvesting fish, and sector vessels are exempt from key effort controls such as trip limits, seasonal closures, days at sea, and various gear restrictions (Department of Commerce 2010).⁵ Following 2010, offshore boats with larger capacity came into inshore spawning areas and caught as much in 1 day as 20 small boats would catch over the whole year. Fish stocks started to decline once again on fishing grounds where they had been building up since 1995.

In September 2012, the US Secretary of Commerce declared a commercial fishery disaster in the Northeast groundfish fishery (Tolley and Hall-Arber 2015). Regulators were forced to reduce Gulf of Maine cod catch limits by 77 % between 2012 and 2013. In November 2014, alarmed by statistics that the number of cod spawning in the Gulf of Maine was only 3 or 4 % of the level needed to sustain the fishery, NOAA imposed a 6-month halt to most cod fishing off New England to prevent yet another stock collapse. As an emergency measure, NMFS created trip limits and additional closed areas. Northeastern states received \$32.8 million in federal relief funds to cope with the cod restrictions (Freedman 2014; Levitz 2014). In Cape Cod, nearly all the restaurants and markets switched out locally caught cod for Icelandic cod. This is an example of non-resilience where local communities are losing control over where their food comes from and the system stays dependent on single fish species.

⁵ In addition, in 2014, NEFMC voted to reduce minimum fish sizes and minimum mesh sizes and exempted sector vessels from previously closed areas.

Summary of the problem

The following management shortcomings during the fishery's history are particularly noteworthy:

- Overall, the fishing effort has been greater than the fishery can sustain. The scale of fishing fleets frequently allows for overfishing within local areas, inflicting long-lasting damage on local stocks. The Department of Commerce has favored large-scale industrial fleet interests over the needs of local small- and medium-scale fishermen.
- The stakeholder participation process for managing the fishery has not adequately incorporated and addressed the concerns of all stakeholders. Management has not utilized local fishermen's knowledge of their fishing grounds and the motivation of local fishermen to sustain their local fisheries.
- Stock assessment science has not been reliable enough to set catch limits that accurately match the biological capacity of the fishery.
- A policy of increasing catch limits for "economic reasons" has led to unsustainable fishing.
- Fisheries assessment and fishing regulations have applied to large fishing grounds, ignoring the unique capacities and seasonal rhythms of the distinct local areas well known to local fishermen.
- Stock assessments and quota allocations are for individual species, but fishermen typically catch many species at once.
- Fishery management policies over the years have been particularly burdensome to small- and medium-scale fishermen, creating economic hardship that has forced many to give up on a livelihood that has been in the family for generations.
- Government policies privatizing fishing rights have led to concentration of fishing rights in the hands of a few large industrial fishing corporations that are not committed to the sustainability of local fisheries. Local fishermen are being pushed out of the fishery.
- The business model of high volume/low value provides incentives for overfishing while depriving smaller-scale fishermen of a decent income.
- Fishing has focused on a few high-priced species, even though other species are caught at the same time. As a consequence, fishing boats waste part of their catch by throwing low-priced fish overboard. Besides being wasteful, the focus on high-priced species causes imbalance in the ecosystem and has made high-priced species more vulnerable to collapse.
- The seafood value chain is increasingly under the control of multinational corporations which threaten to undermine local communities' ability to decide how best to manage a resilient seafood system.

Paradigm for a healthy fishery

A healthy fishery maintains the long-term viability of the marine ecosystem while providing a sustainable supply of seafood and a decent livelihood for fishermen.

- The scale of fishing matches the sustainably available fish stock in each subzone. Fishermen tailor their gear types, tow periods, and trip length to fit local conditions. The large-scale fleet is restricted to offshore areas appropriate to its style of fishing and scale of operation.
- Fishing is seasonal according to the life cycle of each species. Seafood markets respond to the ecosystem, not the other way around.
- Fishery management takes a genuinely participatory co-management approach, like in Maine's lobster fishery (Acheson and Taylor 2001).
- The fishing fleet is diverse, and the viability and integrity of local, small-scale fishermen are preserved.
- Overfishing of the more popular species, and wasteful discard of bycatch, is curtailed by expanding local seafood choices and fishing effort to include underutilized fish species.
- Fish is considered part of the local food system, not a global commodity, and fresh local seafood is easily available at reasonable prices.
- More control and value remain within the region and support the move toward a "low-volume/high-value" model of fishing, where value includes economic, social, ecological, and food system value.

The Northwest Atlantic Marine Alliance and Fish Locally Collaborative

The Northwest Atlantic Marine Alliance (NAMA) was born in 1995 out of widespread frustration with the trajectory of ocean policies and fisheries management. NAMA's approach was to create a decentralized network that would bring different stakeholders together to work on common problems and to restore and enhance sustainable marine ecosystems through community-based fisheries.

In 2005, NAMA helped organize a Fleet Visioning Project for New England that engaged over 250 stakeholders. The final report articulated a vision for a diverse fishing fleet that would include multiple scales of fishing that could match the dynamic inshore and offshore areas of New England's coast. In short, this fleet would be economically viable, ecologically resilient, and managed bottom-up (Table 2).

For the first decade, NAMA was in pursuit of collaborative research and visioning toward community- and ecosystem-based management. Although strong in knowledge base,

NAMA was weak in using it to sustain the broad movement that it needed to realize its vision. Initial attempts to build a bottom-up and decentralized network were difficult. Fishermen and allies were accustomed to the traditional methods of top-down organizing, and the learning curve proved to be a significant challenge. It was not until NAMA began to look at fisheries as part of the food system, partner with new allies, and look at other models of movement organizing that a fresh model emerged.

In 2008, NAMA revamped its organizing model and created the Fish Locally Collaborative (FLC), modeled after Coming Clean (<http://comingcleaninc.org/>), which was effectively organizing a broad spectrum of organizations, communities, scientists, and individuals to address the impact of persistent pollutants while fighting the chemical industry lobby. At the time, the Northeast fishing communities were in dire straits: major policy transition, fish prices lower than the cost of fishing, momentum favoring larger scale, and community-based fishermen getting left behind.

What began as 30 people in Maine would eventually grow to include nearly 500 individuals and 60 organizations, including fishing community organizations such as Penobscot East Resource Center in Maine, Women of Fishing Families in Massachusetts, the Island Institute in Maine, Hatteras Connections in North Carolina, Pacific Coast Federation of Fishermen's Associations, Alaska Marine Conversation Council, and partner organizations such as Slow Food, Real Food Challenge, Chef's Collaborative, Why Hunger, National Family Farm Coalition, Rural Coalition, Health Care Without Harm, the American Sustainable Business Council, the New Economy Coalition, US Food Sovereignty Alliance, and more. The network now connects over 400,000 fishing families around the USA as well as Canada, Mexico, Belize, Italy, France, and Britain. A diverse network of fishermen, food advocates, marine and fisheries scientists, social scientists, economists, local business advocates, chefs, faith-based organizations, food supply workers, health care institutions, fishing communities, and coastal community advocates come together nationally and internationally under the umbrella of the FLC.

Through facilitated workshops, FLC members created a set of principles that include the following: transparency, collaboration, justice, capacity building, respect, inclusivity, openness, and accountability. These principles hinge on the shared belief that the ocean is a public resource, and no individual owns the property rights over any fish species or any marine ecosystem area.

NAMA's role within the FLC has five parts:

- Provide leadership development support for workgroup co-organizers;
- Be the keeper of the FLC's values, purpose, and guiding principles;
- Strengthen and expand the base of support;

Table 2 Outcome of the Fleet Visioning Project

The Northeast Region’s Vision for the Future of the Groundfish Fleet	
DIVERSITY	A geographically distributed commercial and recreational fleet that includes all gear types and boat sizes.
ECONOMIC VIABILITY	An economically viable, safe, and sustainable fleet that works with shoreside infrastructure to supply seafood and job opportunities for coastal communities.
GOVERNANCE	Participatory, accountable, and decentralized governance structures at various scales that include local involvement in decision-making and maintain an adaptive regulatory environment.
ENVIRONMENTAL RESILIENCE	Fishery stakeholders who exhibit stewardship of resources that is consistent with the long-term health and restoration of the marine ecosystem.
In Summary,	A diverse, economically viable, and environmentally sustainable fleet that is managed through a participatory governance structure.

Source: Fleet Visioning Project (2005)

- Support the FLC’s organizational infrastructure and needs including financial, structural, staff support, and logistics; and
- Explore new opportunities where others do not yet have the capacity to lead.

The FLC uses a decentralized structure to support community leaders in their own communities and organizations, helping to build capacity and leadership support. The collaborative does not look like a traditional pyramid model where a few people at the top speak on behalf of all the members. Instead, the FLC creates space for others to speak on behalf of themselves and strengthen each other’s common goals wherever possible. NAMA’s role is to be a “backbone” or “anchor” support for the FLC structure.

The FLC has become the primary vehicle through which NAMA does its work. The main goals are to improve the marine ecosystem and keep community-based fisheries afloat. The agenda, tactics, and strategies for NAMA are based on what collaborators in the FLC determine to be important, drawing upon ideas that “percolate up” from fishing communities. Local fishermen and fishing communities who are most impacted by policies, changing markets, and ocean conservation are at the head of the decision-making table.

Two main strategies are (a) market transformation and (b) influencing policy.

Market transformation

The FLC’s Moving Market and Food Justice Workgroup finds common ground, builds relationships, and supports opportunities that promote good, clean, and fair seafood for all. The workgroup envisions a seafood economy based upon a quadruple-bottom-line set of values by measuring social, economic, ecological, and food system impact. In such a vision, fish workers get a fair price; regional seafood markets adapt to the ocean’s health; everyone has access to good, as-local-as-possible seafood; and the individuals who produce, distribute, and consume seafood are at the center of decision making on food systems and fish policies. This is the vision toward a market that supports seafood resilience.

The workgroup creates space for FLC collaborators to share ideas, projects, and events to build collaborative partnerships wherever they may strengthen the work and promote the shared values. Areas of work include fish-to-institution programs and regional food hubs, as well as infrastructure, fair price, fisher/farmer partnerships, and more. The working group also serves as a nexus where marketing work connects to policy opportunities, research needs, public education, and messaging strategies.

Examples of putting these principles into practice include (a) community-supported fisheries, (b) institutional procurements, and (c) public seafood markets.

Community-supported fisheries

In the mid-2000s, the Port Clyde (Maine) fishing community realized that it needed a change. Policy was not meeting the needs of local fishermen, and the fish stocks were in poor condition. Fishermen knew that the “high-volume/low-value” approach to their fisheries was a one-way road to overfishing. It made no sense to continue paying fishermen a price that did not cover their real cost of operation while the consumers were paying much more than they should for packaged, frozen, or days-old seafood trucked hundreds or thousands of miles when it was caught steps away from their homes. Fishermen knew that in order to save the fish along with their livelihoods, they needed to start fishing smarter, not harder.

Along with allies like NAMA and the Maine Organic Farmers and Gardeners Association, the Midcoast Fishermen’s Cooperative created the first-ever community-supported fishery (CSF) in 2007, modeled after community-supported agriculture. The pilot CSF, Port Clyde Fresh Catch, was successful in allowing the community-based fishermen to reach consumers with a new message, introduce under-appreciated fish species, receive a price that better reflected their cost of operations, infuse seafood in the local food markets, and build a political base of support.

Building upon the momentum generated in Port Clyde, the FLC’s initial directive was to help expand the CSF movement. In response, NAMA along with leaders from Port Clyde created the first CSF “Bait Box”—a collection of practical tools that communities could use to create more CSFs. For the first few years of the CSF movement, NAMA acted as the primary source of support. In 2012, FLC participants organized the first-ever National Summit on Community-Supported Fisheries. Outcomes of the summit included a more robust tool kit, a formalized CSF network, and an online home for CSFs which evolved into www.localcatch.org.

As of 2015, CSFs have grown from one pilot project in Port Clyde to 30 in North America. There are currently 50 globally, as far away as New Zealand. The day-to-day work of creating community-supported fisheries is being effectively handled by the volunteer team that coordinates the www.localcatch.org website, and NAMA’s role has been intentionally reduced to providing backbone support for the network.

Many models are being implemented, but these are some common characteristics of a CSF:

- Modeled after community-supported agriculture, a CSF is a community of consumers collaborating with local fishermen to buy fish shares directly at a predetermined price for a predetermined length of time. Consumers agree to buy whatever the fisherman catches.
- CSF members (also called shareholders) give fishermen financial support in advance of the season and, in turn, receive a weekly share of seafood caught during the season. The fishermen benefit by receiving necessary resources early in the season, bridging the gap between pre-season expenses and fishing season income.
- Participating fishermen get a consistently higher price for their entire catch than they might get wholesale. That, in turn, deters wasteful dumping of less valuable species.
- Consumers get fresher fish at a lower price.
- A CSF reconnects people to the ocean and can help build rewarding relationships between fishermen and shareholders.
- Consumers have the benefit of knowing that their fish is caught locally and that their investment is strengthening the local community.
- A typical CSF cuts the average travel distance from fishing dock to point of sale from 5000 mi down to just 40 (Conniff 2014).

In 2013 Dock to Dish, a CSF based in Long Island, NY, piloted the first restaurant-supported fishery (RSF) which had strong success in its first 2 years. By tapping into chefs in the area, the word of mouth about locally caught seafood spread even faster. Another RSF began in New Hampshire that same year. In addition, the FLC network has connected many CSFs to health care partners offering CSF drop-offs at their facilities. These have proven to be great opportunities for educating and engaging the facilities staff in this work as well as introducing their food teams to the possibilities and ease of working with local seafood.

Institutional procurements

In 2010, FLC members developed strategies to convince New England hospitals, schools, and universities to shift their seafood-buying policies to the new vision that emphasizes a local, seasonal, transparent, fair price, and more resilient model. FLC members working on this project included commercial fishermen, seafood wholesalers, and such non-profit organizations as Health Care Without Harm, the Boston Collaborative for Food and Fitness, Slow Food, and the Real Food Challenge.

Boat to hospital Many health care institutions consider not only the health values of the food that they feed patients but also the overall ecological footprint of their operations. That is why Health Care Without Harm (HCWH) began working with health care institutions in recent years to shift their buying habits from industrial, highly processed foods to locally grown foods. HCWH’s focus was on land-based foods, and starting in 2009, they began conversations with NAMA to determine how similar approaches can be adopted for sea-based foods.

In 2010 NAMA, HCWH, Gloucester Fishermen’s Wives Association, the Massachusetts Fishermen’s Partnership, and other FLC partners hosted a day-long event for health care facility executives in charge of food procurement throughout the Northeast. Thirty-six participants from 18 Northeast hospitals spent the day learning how to make the transition to local seafood. They learned that when they demand a handful of fish species perfectly formed and cut into white fish squares—even if it has the Marine Stewardship Council certification—they are not achieving their sustainability goals. As Beaton (2014) notes, certification programs tend to ignore such values as “ensuring a fair price for fishermen, maintaining independent owner-operators, sustainable fishing practices, safe working conditions, environmental stewardship, and social responsibility.” Yet, several of these are values important to many of the health care institutions. Learning how to adapt their buying to support the fisheries’ social economy provides benefits to all. Hospitals need to diversify, going with the seasons of the ocean and with what fishermen are catching. Besides promoting healthy diets for their patients, this improves the livelihood of local fishermen and reduces environmental impacts. Hospitals can lead the way toward seafood resilience.

An early adopter was Fletcher Allen Health Care in Vermont, now renamed the University of Vermont Medical Center. During the 2010 field trip to Gloucester, their Director of Nutrition Services, Diane Imrie, said the following:

We reviewed the seafood certifications and red/yellow/green lists, but after we laid out our organizational values we realized that although the certifications/lists were a good start we needed to go deeper to make sure our seafood purchasing policies matched all of our values. (Tolley and Hall-Arber 2015)

In 2011, an initial pilot program in Boston focused on Boston Children’s Hospital, Beth Israel Deaconess Hospital, and Brigham and Women’s Hospital. Boston Medical Center and Kent Hospital in Rhode Island later embraced the program as well. The pilot network of hospitals began to shift its seafood buying power toward more local and seasonal purchases, requiring additional transparency in the value chain, including information about who caught the fish.

Today, health care facilities from every New England state are working on shifting their seafood purchasing policies to reflect these new ideals. These efforts are highlighted in HCWH’s *New England Healthy Food in Health Care Report 2014* (HCWH 2014).

Boat to school Building on the boat-to-hospital model, several FLC participants began looking at opportunities for boat-to-

school. In 2009, the FLC market transformation workgroup organized a focus group to analyze opportunities to influence schools’ and universities’ seafood buying practices. Members including fishermen, food activists, and partnering coalitions, such as the Eat Local Foods Coalition of Maine, created a survey to understand the needs of regional schools. From there, a common vision was established to shift toward local seafood value chains that could meet the needs of the regional community.

One early success story is the University of New Hampshire (UNH). UNH and its dining halls had a strong commitment to buying local food, supporting local economies, and meeting high-quality standards. However, there was a disconnect when it came to seafood. UNH was the second largest food purchaser in the state, yet none of its seafood came from New Hampshire boats or supported New Hampshire shore-side businesses (Tolley and Hall-Arber 2015).

FLC members and partners such as Slow Fish International, Granite State Fish, Sea Grant, UNH students, and New Hampshire fishing families discussed a desire to develop a common vision for improving the health of the fishing community. Led by the fishing families and UNH students at Slow Food UNH, they launched a 2-week program to educate the broader community, celebrate locally caught seafood, and acknowledge existing problems facing the fishing community and health of the ocean.

Slow Food UNH students later met to discuss how to address their values when it came to UNH’s seafood purchasing policy. Meanwhile, discussions and meetings among FLC members helped to organize a diverse team of Slow Food students, wholesalers, fishermen, Sea Grant, the UNH Sustainability Institute, and food activists to meet with the University Dining Services. The group presented a proposal to drive UNH’s seafood purchases toward local sources, thus matching the values of the students.

UNH Dining Services agreed. In April 2014, UNH Dining Services committed to change its buying practices, starting with a 10-week pilot program to source from New Hampshire boats, buy “under-loved” species of fish (e.g., dogfish, redfish, skate), educate students about locally caught seafood, and ensure a fair price for the fishermen (Tolley and Hall-Arber 2015). Efforts to build upon the successful pilot program are currently ongoing.

Additional efforts to broaden the audience and combine student activism with university seafood policy continued in 2014 with the Real Food Challenge’s first-ever “Fish Camp.” Fishermen, processors, and students developed a long-term strategy for shifting seafood markets and leveraging political support for community-based fishermen.

Cape Ann Fresh Catch (CAFC), the nation’s largest CSF, has also established a boat-to-school program that delivers locally caught seafood to public schools in Gloucester and Manchester-by-the Sea, Massachusetts. By preparing and

offering dishes such as fish cakes made with locally caught pollock and redfish soup during lunchtime, CAFC has fueled the demand for seafood from the area, not from overseas. Based in Gloucester, CAFC has also appeared at regional high schools and tech schools to show students and budding chefs how to process and prepare locally caught seafood. These initiatives teach students about where their seafood comes from, strengthening their understanding of the importance of locally caught fish and shellfish.

Public seafood markets

Boston is the oldest continuously operating commercial fishing port in the USA, yet for many years, retail outlets for day-boat fish (fish caught locally by small- and medium-scale fishermen bringing their fresh catch in each day) were hard to find. Boston lost easy access to day-boat fish in the mid-1900s when the original Faneuil Hall Market Place closed (City of Boston 2012). Also, the sale of fresh seafood was banned from farmers' markets and any other public property.

In 2010, FLC members took part in a series of conference calls, meetings, and workshops to analyze current market structures and the impacts to fishing communities, seafood, and the ocean. Members agreed that seafood markets were being driven by a global exchange of seafood, with high rates of imports, high rates of exports, high rates of mislabeling, and little transparency. This resulted in low prices to fishermen which, in turn, led to efforts to increase the volume of fish landed.

The status quo market system met the needs of industrial-scale companies while neglecting the needs of smaller-scale, independent companies that comprised most of the FLC membership. FLC members developed a new vision of a market that would meet the needs of smaller-scale commercial fishermen, rural coastal communities, and a regional seafood value chain, together with providing increased and affordable access to locally caught seafood. One strategy to achieve that vision included supporting farmers' markets and open exchange spaces for direct sales.

Concurrently, CAFC began delivering seafood to Boston area shareholders. While CAFC was partnering with farmers' markets and community-supported agriculture in other communities, it ran into roadblocks in Boston due to the ban on the sale of seafood in farmers' markets. One of the delivery points for CAFC, Community Servings in Jamaica Plain, was administered by someone who would later fill the role of Director of Food Initiatives, a newly created office by the late Mayor Thomas Menino. Learning about the work to shift the market and the experience of CAFC, the new director became an advocate for changing the ordinance.

Also, at that time, a relationship started with the Sustainable Business Network (SBN) of Massachusetts, and together with NAMA, they organized a "Seafood Throwdown" event

at the very first Boston Local Food Festival organized by SBN. For Seafood Throwdowns, organizers invite two chefs from well-respected restaurants to compete with each other in a timed event to prepare a "locally caught mystery seafood," accompanied by products purchased at the local farmers' market. A panel of judges selects the winning dish, after which all observers were invited to taste both dishes. The SBN-NAMA event raised public awareness and served to strengthen the relationships among key collaborators.

The three activities together —FLC's market visioning, CAFC's struggles against the ban, and the process of asking for permission for a Seafood Throwdown in a city that did not allow the sale of seafood on public property—led to the overturn of the ban on May 12, 2012. For the first time in 70 years, local fishermen were permitted to sell their catch directly on public property in Boston, including farmers' markets (City of Boston 2012). In fact, Mayor Menino celebrated the announcement with a Seafood Throwdown at the City Hall Farmers Market on June 27, 2012 (Tolley and Hall-Arber 2015).

The examples above help illustrate how the FLC is developing a "strategy of the commons" that is leading the way toward a more resilient seafood system that satisfies the "quadruple bottom line" by embodying values: fair price for fishermen, a healthy ecosystem, local economies with local control and access to local seafood, and community social improvement.

One additional effort to highlight is the Food Solutions New England (FSNE) network which has been a sister network to the FLC. FSNE began in 2010 with the vision that 50 % of what New England residents consume should come from New England by the year 2060 (Donahue et al. 2014). The tag line is "50 by 60." Currently, New England is only feeding itself at 10 %. FSNE is pulling together stakeholders from the region to make plans for how to achieve the vision. The goal is not just to feed New England with regionally grown, harvested, and caught food but, in addition, to transform the New England food system into a resilient driver of racial equity and food justice, health, sustainable farming and fishing, and thriving communities. The FLC is providing leadership and capacity to tackle the fisheries strategy for helping to achieve the vision.

Influencing policy

The FLC's other main strategy besides market transformation is to influence policy decisions. Recently, the focus has been on Amendment 18 to the Groundfish Plan and upcoming changes to the Magnuson-Stevens Act.

Amendment 18 (the fleet diversity amendment)

Starting in 2010, FLC participants sought to ensure a level playing field for small- and mid-scale fisheries and to ensure

that access to the fishery be in the control of communities and not large-scale outside interests. Amendment 16 to the Groundfish Plan put in place a Catch Share policy without important safeguards, so it became essential to find a way to retroactively get those safeguards in place.

FLC participants discussed solutions that would achieve the common vision of a diverse fleet that included various gear types, geographical locations, and scales of fishing. Possible solutions include establishing safeguard measures such as quota caps that limit the amount of quota that any one individual or company may own; owner-operator provisions that require the quota or permit owner to have “boots on deck,” so that quota is not viewed as an investment by non-fishermen; restricting inshore (area-based) fishing grounds to scale-appropriate fishing vessels; and providing affordable access opportunities for disenfranchised communities, such as a quota set-aside program.

Solutions that were ultimately suggested for the NEFMC to explore for Amendment 18 included the following:

- Increase the transparency of quota trading and ownership.
- Establish mechanisms to maintain a scale-appropriate fishery in critical inshore areas; for example, gear restrictions, trip limits, and incentives for each boat to fish in only one subzone.
- Establish quota set-aside programs to reward sectors that are able to meet certain benchmarks, such as promoting access for disenfranchised communities.
- Establish policies that ensure that quota is fished by fishermen and not used solely as an investment tool.
- Establish leasing and permit trading constraints that maintain affordability for smaller-scale fishing operations and new entrants.
- Establish leasing and permit trading rules that prevent consolidation into larger fishing operations.
- Set Catch Share accumulation caps—e.g., somewhere between 2 and 5 %—for each fish species for any one entity.
- Set aside a quota for young fishermen to get into fisheries.
- Establish an inshore/offshore line, so that larger vessels with more fishing capacity, or those that have accumulated a lot of permits, operate only offshore and leave the inshore areas for the other fishermen who traditionally fish there.

The FLC workgroups led outreach to a diverse range of people including fishermen, youth, fishing-related businesses, chefs, local economy and food activists, conservation groups, faith groups, family farm organizations, and hospitals. They sent consistent messages, letters, testimony, videos, and even “textimony” to fisheries decision makers to acknowledge the agreed-upon problems and suggested solutions.

Simultaneously, NAMA launched the “Who Fishes Matters Campaign” to complement the momentum achieved by FLC participants. Started in 2010, the campaign’s intention was to broaden the New England discussion around fleet diversity to connect with other national and international networks. For example, the Slow Food/Slow Fish international organization has highlighted the campaign as part of its international organizing work to resist fisheries privatization and offer alternatives. The US Food Sovereignty Alliance also highlighted the New England campaign as part of the network’s focus on resisting land and fish “grabs” that limit food access to fewer participants. This served as a backdrop for the efforts to persuade the NEFMC to consider an amendment with safeguards designed to promote fleet diversity.

In September 2015, the NEFMC approved Amendment 18 with a 15.5 % cap on quota ownership by a single entity and no other provisions in response to FLC recommendations for safeguarding small- and mid-scale fishing operations, local fishing communities, and the inshore fishery. As approved, Amendment 18 provides only token protection for fleet diversity; as few as seven companies could control the entire fishery. Because the NEFMC and its process for public input have shown a lack of accountability to local fishermen, the FLC has mobilized its partner organizations and the public to take its message to the NMFS authorities in Washington (<https://thunderclap.it/projects/31991-stop-wall-street-fisheries>).

International channels have also opened up. For example, in 2014, the UN Special Rapporteur on the Right to Food reported to the United Nations measures to establish protections for small-scale fisheries. FLC participants are working with international allies to prepare for the UN process, including the World Forum of Fisher People, World Fishworkers Forum, La Via Campesina, Europe’s Responsible Fisheries Alliance, Grassroots International, International Collective in Support of Fishworkers, Slow Food/Slow Fish, Slow Youth, the European Commission’s FARNET, and others.

Reauthorization of the Magnuson-Stevens Act

NAMA and its FLC partners have also weighed in on the pending reauthorization of the MSA. In an August 2014 letter to Congress, they recommended the following changes and additions to the Act:

- *Ensure fleet diversity and national benefits.* Various fisheries management approaches, including Catch Share management, are consolidating fisheries access into fewer and larger-scale businesses to the exclusion of owner-operator, younger generation, and independent fishermen. This consolidation creates a disproportionate loss of

fisheries access to rural communities, loss of infrastructure, negative ecological impacts, and loss of food access. Baseline safeguards must be established to ensure that opportunity is provided for a more diverse fleet, that access remain affordable, that owner-operators be incentivized, that scale of fishing matches the scales of the ecosystems, and that access be tied to regional goals and vision.

- *Account for non-fishing impacts in fisheries policies.* Current fisheries management is obligated to manage healthy fish stocks, and yet, it is not required to address non-fishing impacts such as climate change, pollution, deforestation, mining, and oil and gas exploration. All of these have enormous effects on fish population and health.⁶ The narrow approach and micro-focus on controlling fishing pressure to maintain healthier fish populations place a disproportionate level of blame and responsibility on fishermen and deflect responsibility from large-scale polluters, oil and gas companies, and others whose business affects the ocean.
- *Manage fisheries through the food system lens.* Current fisheries management is incapable of accurately evaluating how well we are actually feeding people. The neglect contributes to our lack of understanding for where seafood goes, whom it benefits, and whom it excludes. National Standard 1 of the MSA should ensure that we improve how we achieve the goal of “greatest benefit to the nation,” to include access to an adequate supply of healthy, local seafood.
- *Incorporate transparency and accountability in fisheries policy making and management processes.* The current regional fishery council processes for drafting of fisheries management plans are not well suited to address the needs of independent and owner-operator fishermen, nor to consider and incorporate the perspectives of fishing communities and consumers of local seafood. Management programs such as Catch Shares are further concentrating fisheries access into fewer hands, and coupled with global investment strategies to acquire fisheries access, it is critical that we increase levels of transparency so that fisheries managers and the public understand who is controlling fisheries access. In addition, the same policies are leading to more and more data and information being labeled as “proprietary information,” keeping the public in the dark about what is really happening to the ocean commons. The council process must be reformed to better represent the wide range of concerns of fishing communities and of the national interest, and more information needs to remain in the public domain.

⁶ Climate change is an increasingly important factor: The Gulf of Maine is warming faster than 99 % of the world’s oceans, and its groundfish are leaving for colder waters (Freedman 2014).

Conclusions and recommendations for further research

By influencing markets and by shifting the dominant narrative of New England policy makers, the FLC is proving an effective model to promote alternative values and develop a new vision, while garnering the political power necessary to rival the dominant paradigm.

Key to the FLC model has been mobilization of a diverse network of collaborators around a set of commonly held values and a unified communication strategy. The FLC is committed to advocating fleet diversity as well as the social, economic, environmental, and food system values of smaller-scale fishing operations at all levels of policy. Because local fishermen have the motivation and knowledge to fish their local fishing grounds sustainably, there is a strong connection between the health and viability of fishing communities and the health and viability of the fishery.

Research is needed to examine the implications of the FLC paradigm for the health of the region’s fisheries, marine ecosystems, fishing communities, and food system by comparing the FLC paradigm with the existing one. Research could include, for example, assessment of the following overlapping elements:

- The contribution of fisheries to the regional food system and access to nutritious food
- Community wealth derived from fishing versus wealth derived from trading in fishing rights
- Social, economic, ecological, and food system values of low-volume/high-value fisheries compared to high-volume/low-value fisheries
- Economic and ecological implications of fishing industry consolidation and concentration of fishing rights, not only for target fish species but also for the entire marine ecosystem
- Social well-being and demographics of diversified fishing/coastal communities and the ecological health of their fisheries, compared to communities dominated by industrial fishing or undergoing privatization due to introduction of tradable Catch Share policies
- Fishing practices and local organization that would best enable fishing communities with local management authority to fish sustainably
- The concrete form that well designed co-management could take and benefits to be expected

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