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MAINE FOOD STRATEGY
FISHERIES PRIMER

MAY 2014



Maine Food Strategy
Fisheries Primer
Integrating Fisheries into a Maine Food Strategy
May 2014

The Maine Food Strategy Fisheries Primer was developed by Penobscot East Resource Center for the Maine Food Strategy from interviews with over 20 business people and organizations involved in the fisheries industry including fishermen, processors, industry groups, research and educational institutions, and state agencies. The Primer provides a broad overview of fisheries management and regulation, the role of fisheries in the food system and highlights key considerations for its place in a Maine Food Strategy.

Penobscot East Resource Center

is a nonprofit organization that works to secure a sustainable future for fisheries and fishing communities in Eastern Maine and beyond. The organization promotes a model of co-management where decisions are based on the best science informed by fishermen's participation, engagement and commitment. Located on Stonington Harbor, Penobscot East serves 50 fishing communities in eastern Maine between the Penobscot River and the Canadian border, the most fisheries-dependent region on the east coast of the United States. For more information, visit www.penobscoteast.org.

The Maine Food Strategy

is an initiative to create a strategic food plan for Maine that networks business, nonprofit and government to build a healthy, resilient and prosperous food system in Maine. The Strategy was officially organized in 2012 and is currently housed at the Muskie School of Public Service at the University of Southern Maine. For more information, visit www.mainefoodstrategy.org.

Photo Credit

Credit for the photograph on the cover of this report goes to Andy Bustin, with permission from Maine Coast Fishermen's Association. Thank you, Andy.

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"Integration of fisheries into the Maine Food Strategy provides the state an opportunity to consider its food production and distribution system holistically."

Introduction

Fisheries are an integral part of Maine's food production and any Maine Food Strategy is challenged to incorporate fisheries at a fundamental level. Maine lobster is a key part of the "Maine" brand. The state's approximately 5,000 miles of coast bordering the Gulf of Maine give Maine citizens incomparable access to a 69,000-square mile area that produces millions of pounds of protein and sea vegetables every year. Furthermore, the state's vast lake and river fresh water resources themselves are a source of direct and indirect food productivity. Development in the agriculture sphere has a direct impact on the productivity of both freshwater and marine fisheries.

Development of the fisheries portion of the Maine Food Strategy lags the agricultural side and integrating fisheries requires new study and presents some new challenges. Most fishermen do not yet see themselves as part of the food production; the experimentation and innovation that has gone on in distribution and markets for agriculture in the last 30 years has, until recently, not included fisheries products. The regulatory frameworks for commercial fishing and aquaculture differ greatly from that of agriculture, as does a significant portion of the food safety framework for fisheries products. The environmental regulations that may constrain agricultural production in watersheds provide essential water quality protection necessary for continued fisheries production locally and downstream in the marine environment. Integration of fisheries into the Maine Food Strategy provides the state an opportunity to consider its food production and distribution system holistically.

Fisheries Regulatory Structure – Access to the Means of Production

The most fundamental difference between agriculture and fisheries, both commercial fishing and marine aquaculture lies in the access to the means of production, the vital first step in any food system. Fisheries use public space and public resources whereas farmland can be privately owned or leased. Thus, access to farmland is a property right and a real estate issue. For fisheries, in contrast, access to catch fish or farm sea creatures requires permission from the government, since both are using common property resources that are held in public trust. Thus, to understand and affect the seafood system it is essential to understand the regulatory framework that determines who has access to fish, or to space and resources for aquaculture because the specifics of that framework greatly affect the economic structure of the industries.

“The most fundamental difference between agriculture and fisheries ... lies in the access to the means of production, the vital first step in any food system.”

Commercial harvest of wild fisheries is regulated differently in different areas of the ocean. State jurisdiction extends from the shore to three-miles offshore; federal jurisdiction extends beyond the state’s jurisdiction to 200 miles out. Beyond this distance is considered international waters. All state fisheries regulations are implemented and enforced by the Maine Department of Marine Resources (DMR). All federal fisheries regulations are implemented and enforced by the National Marine Fisheries Service (NMFS). For some intertidal fisheries such as soft shell clams, the state delegates to, or shares its jurisdiction with municipalities.

The policy-making and decisions that govern these regulations are made through a wide array of groups. State management policy inside three-miles is determined by the Maine State Legislature and the Maine DMR, along with many fishery-specific and, in some cases, area-specific councils. Most federal (outside three miles) fisheries are managed through a regional council system. For this region, management groups are the New England or the Mid-Atlantic Fishery Management Councils, depending on the species. Some fisheries that have significant catches both inside state waters and in federal waters such as lobster, shrimp and anadromous (sea-run, river fish such as alewives and eels) are regulated by an interstate compact called the Atlantic States Marine Fisheries Commission (ASMFC). ASMFC is often the locus where states and the federal government reconcile differences in state and federal management approaches for a given species. Finally, some high seas fisheries such as swordfish and tuna are regulated directly by NMFS in concert with international treaties. Aquaculture currently occurs only in state waters and is regulated by the DMR.

Access to fishing, comparable to access to farmland, is often equated to access to working waterfront: the ability to on-load gear and crew and offload product. While a working waterfront is the vital link to the workplace for fishermen, an equally vital and often overlooked form of access is critical to consider in development of a Maine Food Strategy. The opportunity to fish is created by permissions to harvest a public resource, licenses or permits that are issued by either the state or federal government. In Maine, most licenses are issued to a person, none are transferable, and many require the owner of the permit to be the owner of the fishing boat, called “owner-operator.” The permits issued by the federal government are connected to a boat not a person, and are transferrable. Maine aquaculture is regulated through several different types of state leases of specific marine areas, for specific lengths of time. They are issued by the Department of Marine Resources.

Currently the predominance of the value of Maine's fishery comes from state waters and Maine's fishermen have relatively little access to federal fisheries. The structure of the Maine licensing system and consequences of federal permit transferability have created a relatively inflexible and lobster-dependent situation for Maine fishermen. The need to restore access to diverse fisheries has been identified as a high priority by both the Maine State Legislature and the DMR. In 2012, out of 5070 licensed lobstermen, only 2% (101 individuals) had federal permits for species other than lobster. Only 16% (811 individuals) had federal lobster permits.

"While the connection between a productive crop or herd and the health of an ecosystem is true in agriculture, the limits of human control over primary production in fisheries and much of aquaculture, make the relationship of ecosystem health to a productive fishery more direct and incontrovertible."

Ecosystem Health

Wild-caught Maine seafood, which makes up most of the Maine landed value¹, is just that, wild. Wild fisheries are dependent on abundant natural resources which, in turn, are dependent on both a favorable climate and effective fishery management regulations. This requires any Maine Food Strategy to take into account climate science and the interface between fishery regulations and the shoreside system. That interface includes such elements as how fish are harvested, who harvests the seafood, when and where it is landed, and whether or not fishery management rules foster the future health of the resource and continued access rights (permits and licenses) to allow Maine citizens to fish. While the connection between a productive crop or herd and the health of an ecosystem is true in agriculture as well, the limits of human control over primary production in fisheries and much of aquaculture, make the relationship of ecosystem health to a productive fishery more direct and incontrovertible.

Currently, the marine ecosystem that Maine fisheries depend on is highly simplified, primarily focused on lobster landings and not able to support a more stable, diversified natural system. Neither the current state of Maine's wild-caught fisheries nor the status of Maine fishermen's access to rights to fish are well understood by non-fisheries consumers or policy makers. For example, even Maine consumers persist in asking whether their haddock sandwich, eaten in coastal restaurants, is "local." In fact, the area from Penobscot Bay to Eastport literally has not produced *any* cod, haddock, pollock or hake (groundfish) since the mid 1990s -- that means *no*

¹ Landed value is the value of fish brought ashore.

landed groundfish on over half of the Maine coast since the 1990s. Now the groundfish depletion has moved south and the few remaining Maine groundfish vessels are fishing in a tightly regulated federal fishery, many landing out of state, facing federal quotas that have been slashed between 75%-90% in the last two years.

Maine has become not just known for lobster, but highly dependent on it. Lobster has made up an average of 70% of Maine's \$529 million landed value during the last five years. The dependence on lobster would be far greater if not for the value of salmon and the recent Asian market boom for young eels, called elvers. The Gulf of Maine marine ecosystem off the state's coast has been compared in scientific literature to a lobster monoculture. The state is producing record levels of lobster for reasons that appear to be both a result of favorable climate and effective lobster regulations that protect breeders, juveniles and habitat.

"In the next 10 years as the ecosystem changes, the state may see a downturn in lobster availability."

In the next 10 years as the ecosystem changes, the state may see a downturn in lobster availability. At the same time, the state may experience a climate-driven up-swing in other species. Climate effects on lobster have already been seen in Massachusetts. The State has announced that, due to warmer waters, they do not expect to continue to have a lobster fishery south of Cape Cod. Here in Maine, in 2012 the lobster fishery experienced a major shift in the timing of shedding and seasonal cycles of the lobster which, in turn, affected the processing industry and the market dramatically, causing a glut at a time when the processing capacity was unable to absorb it.

The marine environment off the Maine coast is also likely to see a one-time, positive ecological change in the next 20 years due to dramatic changes on Maine rivers. Dam removal started in the late 1990s with the removal of the Edwards Dam on the Kennebec River. Since then, both the Penobscot and St. Croix rivers have been opened and numerous efforts on smaller rivers and tributaries are underway. Many of these dams have been in existence since the mid-1800s and the conditions created by dam removal represent a significant ecological change. Already, alewife (River herring) populations are rebounding as a result. Alewives live the majority of their life in the ocean and this tremendous increase in forage fish is likely to have a positive impact on marine fish stocks as well as marine/freshwater nutrient flows.

As these events unfold, three things will become crucial to the continued health of Maine's fisheries. First, having a regulatory structure that is adequate to protect the conditions for marine productivity. This process is starting as management shifts from single species management to what is being called ecosystem-based fishery

management. Second, having a fisheries licensing system that allows Maine fishermen to diversify. Finally, having a seafood system that can handle that diversification and return value for smaller scale landings of many different species, landed in many ports along the Maine coast.

Seafood System

If Maine's seafood system is to both extract high value from the system for Maine producers, and meet the need of simply processing the volume that fishermen can land, then it needs to move from simply being a source of raw material for commodity seafood production to a more complex system. The issues involved in doing this differ for three sub-sets of Maine's seafood production and should be considered separately: lobster; other wild fisheries; and aquaculture.

First, consideration of the food system, or the seafood system is still a new concept for Maine fisheries. While fishermen and all of the shoreside portion of the fishery business – buyers, truckers, wholesalers, processors, distributors and retailers – are involved daily in the seafood system, most of the individual actors are thinking about their own part rather than looking at the (sea)food system holistically. For this reason, the idea of a Maine seafood strategy is still fundamentally not part of the Maine seafood industry's lexicon, nor its organization of thought.

“Because of the distinctly separate roles many working in fisheries fill, a foundation has not yet been built to engage fishermen in a conversation about the seafood system and its place in a Maine Food Strategy.”

Most Maine fishermen have very little knowledge about the market after their catch leaves the dealer's dock or the particulars of the other types of businesses in the market chain that make up the seafood system. Maine fishermen's experience differs from that of Maine farmers: Maine commodity farmers are familiar with price negotiations and small-scale and organic Maine farmers have, for several generations, been working to expand local direct markets and farm-to-school or farm-to-institution markets. With few exceptions, Maine fishermen have not had these experiences and for many, the "market" is the dealer on the dock who unloads his or her product and with whom there is no price negotiation. Payment for that product is same- or next-day. The key elements in the dealer/fisherman relationship are: the reliability of that payment; the provision of essential inputs for the fishery in question (such as bait, fuel and ice); and, provision of critical over-the-dock services such as moving equipment on and off the boat; and offloading product. Few fishermen have had a chance to get

firsthand education about the work involved in shoreside storage and movement of product, the costs and yields of processing and inventorying, or the workings of the established distribution system. Most fishermen have little to no experience with the tastes and perceptions of seafood consumers in Maine and beyond. Because of the distinctly separate roles many working in fisheries fill, a foundation has not yet been built to engage fishermen in a conversation about the seafood *system* and its place in a Maine Food Strategy.

Lobster and the Maine Seafood System

The major challenge in the lobster fishery is effectively marketing the volume being produced with the caveat, of course, that in a wild system, no one knows how long the current high yields will continue. Maine lobster fishermen have gone from producing 20 million pounds of lobster a year (the long term average before the 1980s) to now routinely producing more than 120 million pounds. The volume is challenging both shoreside infrastructure and markets and demands improved infrastructure and additional services.

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First, additional grading and holding capacity is needed in some ports to keep the staggering volume of lobsters coming ashore alive and healthy until they are sold live or processed. Second, access to processing services is needed. Whereas for years the live lobster market absorbed the state's 20 million pound annual landings, that market cannot expand to absorb the current 100 million pound annual production (128 million pounds in 2012). As a result, much of Maine's lobster catch needs to be processed. And, while there has been rapid expansion of lobster processing in Maine during 2012-2013, it is important to remember that the processor is not the market, the consumer is. Overall, more consumers need to be eating lobster, and at a price that translates to a fair boat price. However, the difficulty of differentiating live lobsters results in commodity prices and a national and international market that does not accurately separate Maine lobster from Canadian or other US lobster products.

The lobster catch is heavily weighted to the eastern portion of the state and fishermen in areas of the state that are not landing large volumes face low prices due to high volume coming from eastern Maine. While Maine has several lobster co-ops, these organizations are challenged to handle, inventory and market the volume of lobster that their members are catching and have little capacity to divert product into experimental channels that could result in new innovation in the industry. The State is well aware of the issues in the lobster market chain and has

commissioned a series of studies that have resulted, most recently, in the launch of the Maine Lobster Marketing Collaborative that will replace the Maine Lobster Promotion Council and is paid through funding from lobstermen and dealers.

Resilience, in both economic and ecological systems, requires diversification. The seafood system challenge is to develop infrastructure and markets that can handle small amounts of many species and return value to boats in many ports.

A second challenge for the lobster fishery and the state's fisheries lies in issues raised by the challenge of sourcing adequate bait supply for lobstering. Until recently, there was adequate fish from the Northwest Atlantic (Atlantic herring, alewives, menhaden) to meet demand. Recently, however, the business has been sourcing bait worldwide. This raises issues of cost (as much as 100% more expensive than native sources) and disease/security. The State is working to regulate introduced species but the risk of disease to Gulf of Maine finfish fisheries as well as issues of sustainability in the supply of these baits sourced worldwide, are ongoing.

Finally, the lobster fishery is vulnerable to rising energy costs. Current lobster boats depend upon large engines and large fuel bills. This could be exacerbated if the fishery shifts offshore into deeper, cooler waters as the water warms. While there are some innovations being explored, currently the industry's profitability could be severely affected by a sharp increase in fuel costs. Furthermore, the price of many of the inputs – fiberglass and vinyl-covered wire traps – are also linked to the price of oil.

Other wild fisheries in the Maine System

Each fishery has different specifics of catching, landing, processing and marketing. As a group, however, fisheries such as scallops, softshell clams, seaweeds, shrimp, and river fisheries (for example, alewives) hold potential for product development, niche processing, labeling and marketing, and experiments with traceability. Because these are smaller fisheries, there is more opportunity for, and fewer barriers to, experimentation and innovation than there are in lobster. A number of companies and new co-ops are moving forward with everything from

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community supported fisheries (CSFs) to processing, branding and marketing. This new and developing infrastructure is highly important. In the future, as climate changes, Maine's coastal fishery that is now heavily dependent on lobster will need to diversify. Resilience, in both economic and ecological systems requires diversification. The seafood system challenge is to develop infrastructure and markets that can handle small amounts of "a variety of" species and return value to boats in many ports.

Aquaculture in the Maine System

Aquaculture is growing in Maine and will be a significant aspect of any Maine Food Strategy. However, seafood production, both wild and cultured, requires first and foremost, adequate stewardship of the Gulf of Maine ecosystem. Similar to the challenges large scale agriculture faces from finite water supplies, insect and disease management, we have learned over the last 30 years about the limitations of intensive aquaculture in the marine environment. The best strategy for production from Maine's marine resources will likely come from a mix of well-managed wild fisheries and aquaculture.

At present, salmon aquaculture production, which is highly consolidated, is increasing. Small-scale aquaculture, particularly shellfish and seaweeds, are also growing and are viewed as a potential source of diversification for Maine lobstermen. The current group of aquaculture businesses have far more experience than most Maine fishermen with the shoreside and market components of the business and have been a point of innovation in the Maine seafood system, developing traceability mechanisms and branding.

Conclusions

Fisheries in the Gulf of Maine are an important resource for the state's economy, communities and food supply and are supported by a dynamic and changing marine ecosystem whose health and productivity, similar to agriculture, depend on factors both within and beyond human control. Unique to this part of the food system, however, is the access of producers (fishermen) to the means of production (fisheries) with limitations based on federal permits, waterfront access and dockside services. Also distinct from agriculture is a more widespread disconnect between the individuals and businesses bringing in the food, and the systems required for handling, processing and distribution to markets and ultimately the consumer. Additionally, the natural resources that fishermen rely on for their trade are public resources, held in common, and rely on the cooperation of many different interests to be sustainable.

In an exceedingly complex, interdependent system where many factors are beyond the direct control of various actors, relationships within the fisheries sector can be surprisingly disjointed and siloed. Not only do many working within the sector fail to understand their personal role as part of a seafood system, the relationship of fisheries to Maine's broader food system is largely unrecognized. The Maine Food Strategy seeks to support

conversations underway in our state and New England about the seafood system and to create a space where these discussions can link to broader interest in food production, food security, economic development and sustainable productive natural resources in Maine.

Additional Reference Material:

- [Phase I Research Summary](#) – Policy Considerations and Core & Emerging Issues sections (pp. 8-11)
- [By Land & By Sea: Regional Forums Data Summary](#) & [Maine Food Security, Jobs and the Environment Policy Brief](#)– Topic areas: Policy, Consumer Education, Infrastructure, Market Access/Marketing
- [Building a Sustainable Seafood System for Maine](#). Alden, R. *Maine Policy Review* 20.1 (2011): 87 -95.
- [Policy Catalog for the Maine Food Policy Review, Special Food Issue](#) – Topic areas: *Fisheries section*: Regulatory, Management, Markets, Distribution, Processing, Infrastructure, Access; *Farms/Fisheries/Overarching section*: Market Development, Institutional Purchasing, Processing, Occupational, Funding, Natural Resources
- [Fishing Communities in Eastern Maine: Results from a Rapid Assessment](#). Johnson, T., et al. 2013. Orono (ME): University of Maine. Supported by NOAA Saltonstall Kennedy Award NA10NMF4270207. (When report is final it will be available on the National Marine Fisheries Service Northeast Fisheries Science Center website.)
- [A New England Food Vision: Healthy Food For All, Sustainable Farming and Fishing, Thriving Communities](#). B. Donahue, et al. (Link to draft version dated June 2013; final version to be published in February 2014).



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