Fishing Community Vulnerability Profile: Eastport, Maine

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Introduction

Commercial fishing is an important economic and cultural element of Maine's coastal communities. Maine fishing communities are suffering from loss of access to fisheries and infrastructure, regulatory impacts and changing resource abundance. Although fisheries managers are required to assess impacts of fisheries regulations on fishing communities, this has proven difficult due to the lack of information regarding the current and historical importance of fishing in these communities and an understanding of how communities respond to change. Vulnerability profiles are a useful tool to gather the comprehensive information necessary to determine cumulative impacts of management decisions on specific communities.

We conducted six semi-structured (Bernard 2005) and seven oral history interviews (Ritchie 2003) with fishermen, other community members and government officials in Eastport, Maine from October 2010 to December 2011. In addition, we conducted 30 interviews with businesses and households in the area. These interviews focused on threats contributing to resilience and vulnerability in the fishing community of Eastport and the ways in which fishermen have responded to these threats. Initial interview informants were selected with the help of Maine Sea Grant Marine Extension Team members and community leaders. Subsequent informants were selected using a snowball sampling approach (Bernard 2005). All interviews were recorded and all oral histories and a majority of semi-structured interviews were transcribed. Detailed notes were taken from other semi-structured interviews. We also held two focus groups with fishermen and other community members as part of our groundtruthing effort. Focus groups were recorded and detailed notes were taken from the recordings. All data were analyzed with multiple iterations of coding following a modified grounded theory approach (Glaser and Strauss 1967, Strauss and Corbin 1990) using QSR NVivo 9 data analysis software. This profile focuses on common themes from these interviews as well as information compiled from secondary research and analysis of quantitative socioeconomic indicators.

Geography and History

> "I don't think we will ever be trampled to death like Bar Harbor due to the geologic area, we're tiny and it's not easily accessible, it's accessible, but not easily accessible, due to how and where we are located on the map we won't be flooded with people, I just don't see that happening, I think it will always remain small, it'll be quality, good caring people."

Eastport is relatively isolated compared to other fishing communities in Maine. The easternmost city in the U.S., Eastport is built on several islands in Washington County, the largest of which is Moose Island. Bays and inlets isolate Eastport from other towns. Passamaquoddy Bay and Cobscook Bay surround Eastport, and the narrow inlet to the Gulf of Maine creates strong tides, giving this community some of the widest tidal ranges in the U.S., about 25 feet.

Map of Eastport, situated within Cobscook Bay.

The topography of the bay is also such that deep water is immediately offshore, facilitating large vessel shipping. A narrow tidal dam causeway connects Eastport to Carlow Island, which is connected to the Pleasant Point Passamaquoddy Reservation on the mainland. Eastport is situated about two miles from Lubec by water but about 30 miles apart by car (one hour). A seasonal ferry operated by Downeast Windjammer Cruises makes trips between Eastport and Lubec four times a day (in the summer). A seasonal ferry also runs between Eastport and Canada's Deer Island, across what is known as the Western Passage. Between Eastport and Deer Island is the "Old Sow," the world's second largest whirlpool. Campobello Island (Canada) is separated by a narrow straight to the southeast of Eastport, but there is no ferry access.

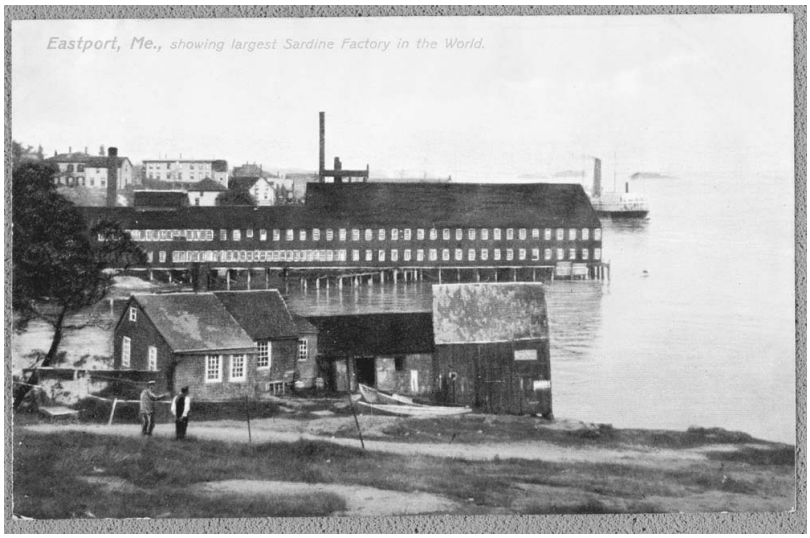
> "There's no more sardine factories left anywhere. I never thought I'd ever live long enough to see the death of the sardine business. I grew up on the tail end of it. I still can't believe there's no sardine factories left at all, anywhere. They're just gone. It's like being a dinosaur. I was part of an extinct occupation now."

The region was inhabited after the last ice age, some 12,000 years ago, by people who became known as the Passamaquoddy (which means pollock-fishing place/people). Their descendents live at one of three Passamaquoddy tribal reservations (with 749 residents) just north of Eastport at Pleasant Point (Sipayik).[1] European settlers founded Eastport in 1780, incorporated as a town 1789, and incorporated as a city 1893. Eastport was a center of an extensive two-way smuggling system during the 1807-1809 embargo the U.S. imposed upon itself. The city was captured by the British on July 11, 1814 as part of the War of 1812, and returned to the United States in 1818. The boundary between U.S. and Canada remained disputed, and finally settled in 1842 (Border Historical Society).

Past industries included boatbuilding, lumber, fishing, and shipping. Port activity peaked in the late 1880s, with roughly half of all vessels hailing from foreign ports. After World War II and the end of the Eastern Steamer line, port activity slackened and the economy declined (Hall-Arber et al. 2001).

Eastport is most famous for its once thriving sardine industry. The first sardine factory in the U.S. was built around 1875, leading to significant growth in the city. According to George Varney in 1886, the population in 1870 was 3,736 and 4,006 in 1880. The population peaked in 1900 at 5,311. As the sardine industry declined, many people moved away and the city went bankrupt in 1937 (Border Historical Society). By the 1960s, there were only two canneries left, and by 1983, the last cannery in Eastport, Holmes Packing Corporation, closed its operation. The loss of the canning industry is cited as a key source of social and economic disruption within the community.

[1] Information about the Passamaquoddy can be found at the following websites: Pleasant Point, Sipayik. Passamaquoddy Tribal Government, wabanaki.com, and the Quoddy Loop, quoddyloop.com/pssmqddy.htm.



Postcard showing the largest sardine factory in the world in Eastport, Maine (Border Historical Society, 2012).

The following excerpt describing Eastport comes from Varney (1886):

> The greatest length of the town is about five miles in a northwestern and southeastern direction the greatest width is about two miles. The form of the island is extremely irregular, and furnishes several good havens. The village is situated on the southeasterly part of the island, on a spacious harbor never closed by ice. Catching and curing fish has been and is still the principal industry of the town. There are now thirteen sardine factories in full operation in Eastport, employing about 800 hands. These factories run night and day during the season, and turn out about 5,000 cases per week. Some $8,000 per week are paid out weekly to the hands, —men, women and children. The fish-curing houses marking the eastern shore of the town, but numerously clustered along the water's edge at the village, are a very noticeable feature from the harbor.

The tides of the bays are another defining feature of Eastport. In the 1930s, Dexter Cooper intended to build dams across two bays in the Eastport area to generate power as the tides receded. With approval from President Franklin Delano Roosevelt and $36 million in backing, the Quoddy Dam project started in 1935, only to lose government funding one year later when the economic feasibility of the project was questioned. The causeway connecting Eastport to Carlow Island is a remnant of this project. Several other plans to create tidal energy plants in Eastport have been proposed, but none were constructed. Recently, Ocean Energy Renewable Company has deployed a commercial scale turbine in Cobscook Bay that has been producing electricity that goes into the regional grid. Their in-stream technology differs from other projects because it does not require a dam to be built. Other projects have also been proposed recently in the area. The prospect of tidal power may be a source of resilience for this community.

A working model of the Quoddy Dam project remains on display in Eastport (National Archives).

Economic and Demographic Profile[2]

> "When I ask people why they come here, it's the beauty, it's the safety, it's not for the work."

A comparison to Maine shows that Eastport is poorer than the state average and also has a relatively high unemployment rate. Service sector jobs, such as retail, make up a significant portion of the income in Eastport, which follows the larger trend in the state. Windjammer cruises, outdoor adventure activities, and arts and cultural activities are attracting increasing numbers of visitors to the area.

In 2010, median household income in Eastport was $30,600 and per capita income was $21,360, compared to the state averages of $46,933 and $25,386, respectively. Eastport features more households with incomes from Social Security and retirement compared to Maine and the nation. In 2010, 12.4% of families and 19.4% of individuals fell below the poverty threshold. This is higher than the state, where 8.4% of families and 12.6% of individuals lived in poverty, but fewer households depend on food stamps. Elderly poverty rates are also high in Eastport, with 20.6% of all persons over 65 falling below the poverty line in 2010.

[2] Economic and demographic data were obtained from the American Factfinder, factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml. Population and housing data are from the 2010 U.S. Census and economic data are from the 2006-2010 American Community Survey 5-Year Estimates.

Household income (%)	Earnings	Social Security	Retirement	SNAP
United States	79.7	27.5	17.5	9.3
Maine	76.5	31.6	18.8	13.6
Eastport	64.5	49.4	27.3	10.5

Table 1: Percentage of household income from earning, social security, retirement and SNAP in 2010. Source: ACS 2010.

According to the U.S. Census 2010, 51.1% of the total population 16 years of age and over was in the labor force. Of the civilian labor force in 2010, 7.2% were unemployed, compared to 6.5% in the state. Top occupations were management, business, science, and arts occupations (38.2%), service occupations (17.2%), sales and office occupations (21.2%), and natural resources, construction, and maintenance (17.2%). Self-employed workers, another category where fishermen could be found, accounted for 21.6% of all workers. As an industry sector providing employment, agriculture, forestry, fishing, hunting, and mining occupations are down from their 2000 levels of 9.8% to 2.6%, which is similar to the state average. However, with many fishermen residing in the surrounding towns, and with the port servicing the lumber and agricultural industries, the census data may underestimate the importance of Eastport to these industries.

Employment (%)	Natural Resources*	Retail trade	Amenities**	Education, health care and social assistance
United States	1.9	11.5	8.9	22.1
Maine	2.5	13.6	8.1	26.1
Eastport	2.6	17.0	12.7	30.8

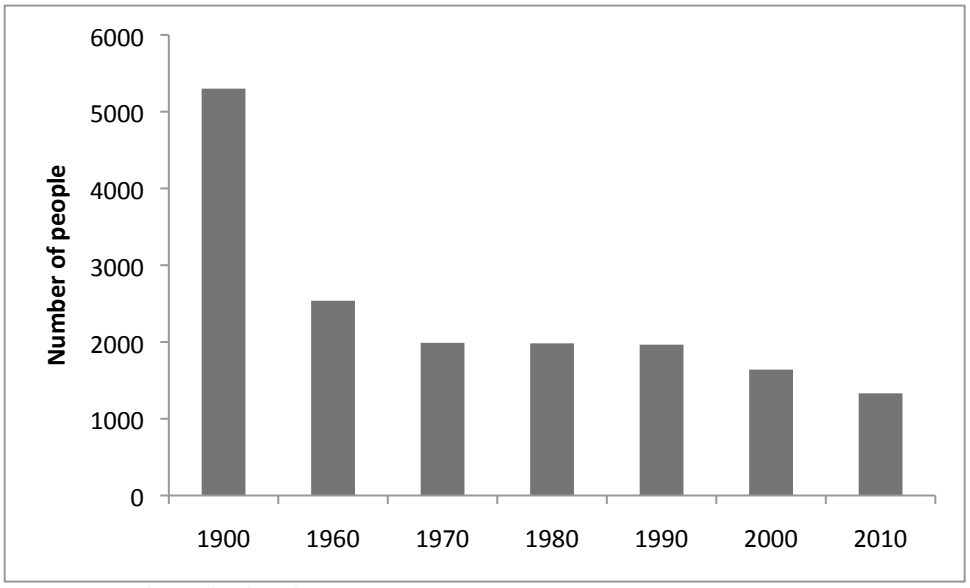
Table 2: Percentage of occupations in 2010 in Eastport from agriculture, forestry, hunting, and mining*; retail trade; arts, entertainment, recreation, accommodation and food services; and education, health care, and social assistance. Source: ACS 2010.**

Eastport's population has been declining steadily. The city's population peaked at the same time as Eastport's high point as a port city in 1900, when it had 5,300 residents, dropping to 1,965 in 1990 (Hall-Arber et al. 2001). Population continues to fall today, although not as rapidly. The population is relatively homogenous; in 2010, 97.3% identified themselves as white.[5]

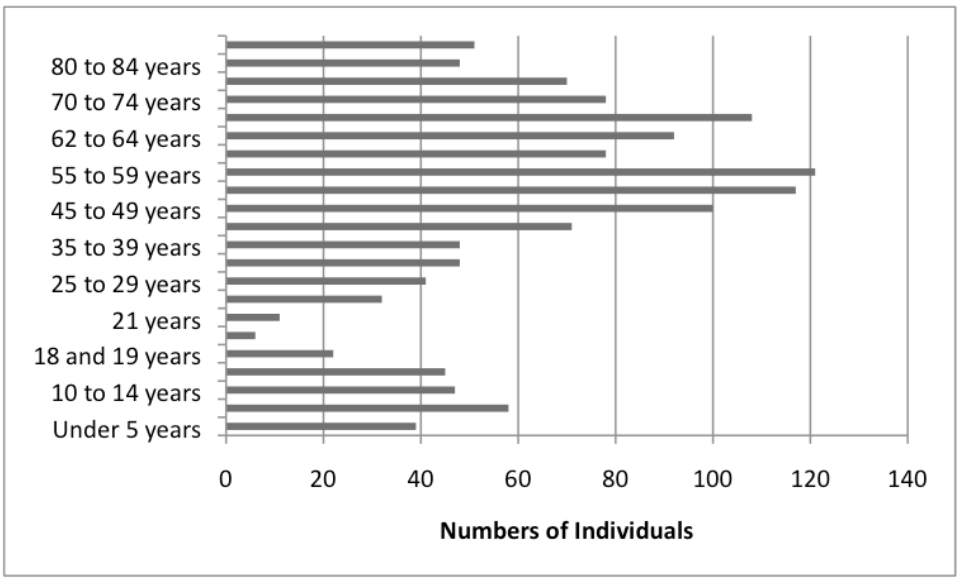
> "The young people aren't going to find jobs here, they are going to get an education and then go to where they can get a job."

Eastport's population is also aging and older than the state as a whole. The median age in 2010 was 54.5, compared to 47.2 in Maine, and 37.2 in the U.S. Nearly 27% of the population was over 65, compared to 15.9% in Maine.[5] As in much of rural Maine, the older population structure is due in large part to out-migration of young people after high school. While there are no statistics available on this process in Eastport, it is

common in rural Maine and evident in the overall age structure of the city. Respondents frequently attributed the out migration of youth to the lack of economic opportunity, and the need to leave for work and education.



Eastport population by decade, 1960-2010. Data source: U.S. Census.



Eastport population by age in 2010. Data source: U.S. Census.

> "Probably the last ten years, we've had more people come in from away and buy summer homes here."

Compared to the rest of the country, Maine has a high rate of seasonally vacant houses and Eastport has recently experienced its own increase. In the last 10 years the rate surpassed the state average. Both demographic trends and interviews completed as part of this study indicate that there has been an influx of retirees and "amenity migrants," many of whom are seasonal residents. Many businesses close for the winter, when the population decreases to a small number of year-round residents.

Seasonal Housing (%)	2000	2010
United States	3.1	3.5
Maine	15.6	16.4
Eastport	7.8	22.8

Table 3. Percentage of seasonal households. Data source: U.S. Census.

Tourism

> "[Tourism is] one of the aspects of the economy we depend upon in the summer. Our summer season's fairly short. We're not at all like Bar Harbor or Camden… in the winter it can look rather bleak. But they try to make enough money in the summer to help tide them over."

Along with restaurants, accommodation and retail shops, businesses catering to tourists offer guided boat trips for wildlife tours and sightseeing. Nearby waters feature several species of whales, and other marine mammals as well as migrating birds. Eastport is increasingly seen as a destination for artists and tourists with art galleries lining Main Street and recognition in several magazines. However, the tourist economy and much of the service economy in Eastport is limited by the short summer season, with the viability of many businesses dependent on those few months. Eastport may be too isolated to fully take advantage of its natural beauty by replacing lost extractive jobs with tourism (Vail 2010). Although study participants acknowledge the increasing importance of tourism, many believe the growth will be limited by the isolation of Eastport. Nevertheless, the Eastport chamber of commerce has increased its organizing efforts in an attempt to attract greater numbers of visitors and increase revenue for local businesses.[3]

[3] Eastport Area Chamber of Commerce, eastportchamber.net.

Creative economy

> "There are so many galleries here, and so many individual studios, that is a real focus of commerce."

Eastport serves as the epicenter of an art community that spans the Cobscook Bay region as is evident by several organizations and nonprofits based in the city. The Border Historical Society involves many community members who help to preserve the history of the region, including nearby Canada. There are numerous galleries operated by individual artists as well as co-ops and exhibits that feature regional artists. Eastport Arts Center, a nonprofit umbrella organization established in 1990, aims "to stimulate and nurture an appreciation of the visual and performing arts and the creative process, and to provide a home and an environment within the community where they can prosper."[4] The Tides Institute and Museum houses and collects numerous cultural exhibits.[5] The National Trust for Historic Preservation has recently named Eastport as one of its "Main Street Programs in Maine," which will funnel money to try to stimulate economic development.[6] These funds among others have helped redevelop downtown buildings, helping to bring in new sources of revenue. Along with the galleries are several programs dedicated to music and the performing arts.

Gentrification

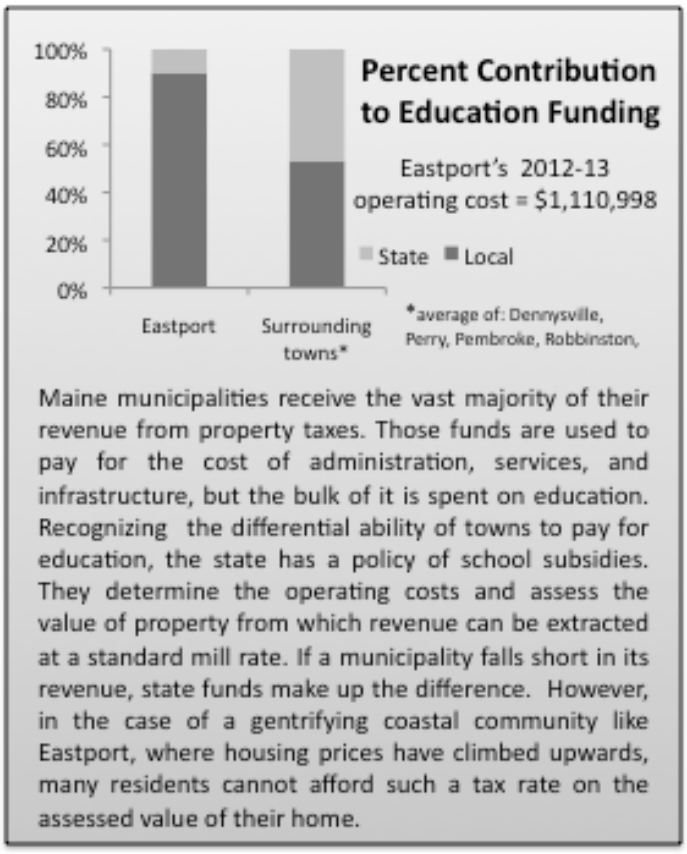
> "People from away think it's really affordable, people who live here and squeak out a living, I think are a little dumbfounded by the prices people are asking for things."

The economic restructuring of Eastport, epitomized by the loss of the sardine plants and loss of fisheries access, has been a driving force of change in the community. The lack of economic opportunity has forced many residents to leave the area, contributing to the population decline (Nelson 2001). Concurrent with this loss of productive activity and those who relied on it has been a pattern of in-migrants purchasing property in the city to take advantage of the relative affordability, natural amenities, and rural lifestyle. The demand for shorefront has led to an appreciation of property values throughout the coast and with these rising housing prices has come escalating taxes. The increasing cost of living has its effect on the local inhabitants as reported by respondents; the high cost of housing has resulted in "locals" being unable to purchase property in their community.

[4] Eastport Arts Center, eastportartscenter.com.
[5] Tides Institute and Museum of Art, tidesinstitute.org.
[6] Main Street Maine, Maine Development Foundation, mdf.org/mdc_main_st_maine.php

Furthermore, if they happen to already own, or inherited property, residents may still be displaced due to the high property taxes. Coping with these increasing costs, many people have started moving outside the community and to back roads away from the water where housing and taxes are significantly cheaper. The majority of fishermen no longer live in Eastport, but in the surrounding towns. This pattern of displacement is a clear indication of gentrification in these communities and a possible source of conflict for fishermen (Hamnett 1991). However, with multiple lobster pounds and the breakwater pier, fishermen's access to the waterfront is assured for the time being.

Box 1: Increasing Tax Burden[1]



Maine municipalities receive the vast majority of their revenue from property taxes. Those funds are used to pay for the cost of administration, services, and infrastructure, but the bulk of it is spent on education. Recognizing the differential ability of towns to pay for education, the state has a policy of school subsidies. They determine the operating costs and assess the value of property from which revenue can be extracted at a standard mill rate. If a municipality falls short in its revenue, state funds make up the difference. However, in the case of a gentrifying coastal community like Eastport, where housing prices have climbed upwards, many residents cannot afford such a tax rate on the assessed value of their home.

Changing demographics have contributed to revitalization in downtown Eastport and a focus on new services. There are several new restaurants and stores, although these are primarily owned and operated by people who have recently moved to the area, and may not be a primary source of income. It is often reported that those who are moving to the area for its amenities are relatively wealthy, bringing money from a previous home sale, and purchasing relatively affordable properties with assets left over. Thus, they are not dependent on the local economy, but increase demand for local services (Robbins 2009). Many of these migrants visited the area as tourists and later decided to purchase a seasonal home with the intent to retire there in the future. The prospect of Eastport as a retirement or semi-retirement community may be restricted by the lack of adequate medical facilities in the immediate vicinity. Generally, rural restructuring is a common aspect of gentrified communities (Nelson 2002), but Eastport's transition is interesting, in that the change is characterized by a growing creative economy. This creative economy stems from many people from away who have helped establish Eastport as a cultural center for the region. Eastport's trend towards artistic aesthetic mimics the process of creating artistic neighborhoods in gentrified urban areas (Lees 2008). However, the isolation that may protect the city from tourism-focused commercialization also hinders the progression of economic development towards higher-paying service sector jobs (Jackson 2006).

Non-fishing maritime industries

Eastport's Breakwater Terminal.

One unusual feature of the city is its deepwater port facilities managed by the Eastport Port Authority and utilized by Federal Marine Terminal for their operations. The facilities are split between the downtown Breakwater Terminal with a depth of 42 feet and the Estes Head Cargo Terminal at 64 feet, the deepest natural port in the Northeast.[7] The Port Authority is the largest local employer in the City of Eastport (Comprehensive Plan, 2004) and its operations have greatly expanded in the past few years.

Although use of the deepwater facility declined after World War II, shipping contracts have increased recently. The downtown pier can serve large ocean vessels and there are two tugboats at the adjacent Fish Pier.[9] Ocean-going freighters use a relatively new port facility on Estes Head to transport an increasing amount of bulk products to foreign ports (Mack 2010d). In the summer of 2010 the port facilities were granted a temporary USDA certification for the exportation of livestock; it is the only such certification in New England and one they hope to make permanent (Mack 2010a). The first livestock shipment was of 500 pregnant cows headed to Turkey, the proximity to which cuts a day off of travel time, lessening the stress on the animals. Within its first 16 months operating with the USDA certification, the port shipped 20,000 heads of cattle (Miller 2011). The director of the Eastport Port Authority explained that the port remains economically vital to the community (Mack 2010e):

> "We are shipping internationally and bringing foreign money back into the U.S. [The port] has repeatedly shown great dividends, and every time someone sees one of these massive ships making their way into the port, they should see dollar signs."

[7] Eastport Port Authority, portofeastport.org.

The Estes Head facility recently was expanded to include a state-of-the-art conveyer system, greater warehousing capacity and loading space. The funds for the $7.5 million renovation came from the federal Department of Transportation ($2 million), state funds ($4.5 million) and local contributions. The conveyor will enable the port facility to handle bulk commodities, specifically bulk wood chips (Bowman 2011, Mack 2011). Previously, Federal Marine Terminal was solely dependent on DOMTAR as its only customer, and the near closure of the Woodland Mill highlighted the need for diversification. After the purchase of the DOMTAR mill by another company now Woodland Pulp LLC, the port shipped its largest volume to date, at 400,000 metric tons (Mack 2010b). Although a proposal to expand and integrate the rail infrastructure to reach the port was denied, the port facilities are becoming increasingly important to the local economy.[8]

Eastport was, until recently, home to New England's oldest boat school. The State of Maine deeded the property to the city in 2007 for $1. The Boat School previously was operated by Washington County Community College and more recently Husson College. The obligation to keep the boat school running was a significant economic burden that the city could no longer maintain. Consequently, the property, including three buildings and 17 acres on Deep Cove Road, was recently sold by the city for $300,000 to Perry Marine and Construction, which plans to turn over eight acres and the three buildings associated with the boat school facility to a nonprofit friends group, Friends of the Boat School. It has plans to build an underwater turbine manufacturing facility on an adjacent site; this was in anticipation of Ocean Renewable Power Company's tidal power project that has been in development since 2004. The city retains ownership of 28 acres (Walsh 2011).

[8] Maine Arts Commission, mainearts.maine.gov.

Box 2: Industrial History and Dependence[2]

Timeline of Industry in Eastport

"People don't realize the whole downtown was chimney stacks, it was massively industrialized and now people fight even the slightest bit of industry."

1875 – first sardine factory opens

1900 – 18 canneries

1935 – Quoddy Dam project started

1936 – Quoddy Dam losses funding

1960s – two factories remain

1977 –Inception of Port Authority

1983 —Holmes packing closes

1984 – Ocean Products establish salmon farms

1998 – facility expansions

2000 – 36 million pounds produced state wide

2002 – epidemic forces closures

2004-2010 – LNG proposals fail

2009 – ORPC tidal power tests begin

2010 – record 400,000 mt shipped

2011 – $7.5 million conveyor system

More than a fishing community and tourist destination, Eastport is an industrial center of the Cobscook Bay region. Periodically, new industries would emerge with the promise of boosting the economy and community, only to be cut short or eventually decline.

The story of Eastport is best exemplified by the **sardine packing industry**, which began at the end of the 19th century, reached its peak at the turn, and was further supported by World War II production. After that it went through a protracted decline, with the final Eastport plant closing in 1983.

In the midst of the packing era, President Roosevelt approved a $35 million dollar project to create the **Quoddy tidal dam** to produce hydroelectric power. A year after its initiation the project was deemed not economically viable and canceled.

Aquaculture has a long history in Maine, but it wasn't until 1984 that salmon pens were introduced to Cobscook Bay. The industry quickly took off, attracting many businesses and individual operators alike, but this success led to its own downfall. The crowded conditions in the bay resulted in epidemics of disease. The need for expensive best-practices and increased international competition resulted in the consolidation of the industry and tenfold reduction in employment, but the industry has since rebounded.

The **shipping** industry has long played a part in the economy, but its importance has waxed and waned over the years. The inception of the Port Authority enabled comprehensive management of the industry, facilitating its expansion, but shipping remains vulnerable to its own clients. Recent expansion promises to increase activity through a more diverse customer base.

The prospect of a **liquefied natural gas** import facility sparked great debate between those who saw it as an economic boon and those who thought it inappropriate for the region. The latter group has repeatedly won the argument and LNG has failed to take hold.

In its wake, Ocean Renewable Power Company approached the community with a proposal for **tidal power**, which has gained traction in the form of test sites and plans for future expansion.

While no single industry can claim to be the economic cornerstone, the several that remain viable along with fishing, tourism and the creative economy may provide a more diverse and stable foundation for the community's future.

Fisheries profile

Fishermen in Eastport have engaged in diverse fishing operations. Key species harvested today are lobster, scallops, sea urchins, clams, and periwinkles. Fishing for finfish such as cod and flounder is now rare and contributes little income due to the collapse of the groundfish fishery and subsequent regulations. Halibut fishing occurs at a small scale, although landings are minimal due to state and federal restrictions. A few herring weirs still operate occasionally in nearby Perry.

Unlike other areas of Maine, lobsters are not as abundant in Cobscook Bay because the strong tides create poor habitat (NOAA 2009). Like elsewhere in Maine, lobsters are an important resource due to relatively high prices compared to other fisheries. About a decade ago, Hall-Arber et al. (2001) reported six boats fished for lobsters in Eastport, and only two of these fished more than 50 traps. In 2002, residents of Eastport held 2,885 trap tags (Comprehensive Plan). Today, fishermen report lobster is a more substantial component of the community's fishing portfolio.

With 12 municipal licenses, clamming is an important aspect of fishing in Eastport as there is no seasonal restriction and it can often fill gaps between seasons of more restricted fisheries.[9] It is one of the few fisheries without a moratorium on licenses and requires less investment in equipment, making it one of the fisheries with the highest participation levels. Red tide closures are common in Eastport and can devastate shellfish harvesters.

Scallops continue to be a vital resource for fishermen in Cobscook Bay. Both divers and draggers harvest the resource. Local fishermen and managers are very concerned about the status of the scallop resource and have been successful in implementing conservation measures for the resource in their area, including a daily catch limit. As one of the last viable scallop grounds in the state, local fishermen express concern about the effects of a highly mobile fleet on the local resource. In some years, more than 100 boats travel to Cobscook Bay to fish for scallops. In 2011, boats were not able to meet the 135-pound daily catch limit, indicating a decline in the resource and prompting the state to implement an immediate closure about two weeks into the season. The president of the Cobscook Bay Fishermen's Association, who lives in Eastport, expressed the industry's concerns about boats from away in an article in the *Bangor Daily News* (Walsh 2012):

> "This mobile fleet travels up and down the coast, and, when they find a bunch of scallops, they are on them like wolves. Three or four days later, there's nothing left. They rape this bay and then go home and finish up the season in their neighborhood, leaving us with nothing."

[9] Maine Municipal Shellfish Licensing, maine.gov/dmr/crd/smd/municipal_licensing.htm.

Scallop management may be changing again in the future, with the Maine Department of Marine Resources proposing rotational closures to "make sure good scallop grounds are set aside for fishing" (French 2012)."

The sea urchin fishery has gone through a boom and bust cycle. The sea urchin is harvested for its roe primarily in the winter, which is sold mainly to the Japanese market. Sea urchin harvesting began in the 1980s, peaked in the 1990s, and is much lower today, although many boats still fish for them. In the 2002-2003 fishing season, sea urchin landings sold in the Cobscook Bay area (Lubec, Dennysville, and Eastport) totaled about 1.5 million pounds valued at $1.9 million.

A very small drag fishery for sea cucumbers takes place in the bay. Those involved in this fishery are from outside of Eastport (Dennysville, Gouldsboro, Little Deer Isle, Lubec, Milbridge, and Steuben), with only six permits for this fishery in the state in 2011.[10] A moratorium on new entrants means this fishery is not an option for local fishermen.

Dragging for species like urchins, scallops, and sea cucumbers is dangerous work. The bottom of Cobscook Bay is rocky in places and tidal currents are swift. If a dragger accidentally hits a rocky patch the gear can catch on the rocks, capsizing the boat. This type of accident has claimed the lives of several fishermen in the past decade. Making matters worse, the bottom was poorly surveyed, increasing the hazard of hitting rocks. NOAA surveyed the bottom of Cobscook Bay in 2010 (Mack 2010c).

Herring remain an important baitfish today. Formerly, weir fishermen could also sell herring to one of the many canneries. Weirs are fences placed so that herring cannot exit an inlet. Some of these are low enough so that fish can enter at high tide but then are trapped as the tide recedes, whereas others trap fish by having a funnel shape that leads fish through a small opening that is hard to exit. About a decade ago, there were about 12 weirs in operation (Hall-Arber et al., 2001). Key informants report only a few herring weirs still in use in inlets around Eastport, notably in Perry.

There is also a nori (seaweed) processing plant and a new fishery harvesting rockweed is developing. Fishermen from the Bay also report periwinkles are an important source of income for some individuals. There has been some conflict between rockweed and periwinkle harvesters.

Saltwater recreational fishing is also an important activity for the community, and this includes clams, mackerel, and flounder. Most recreational fishing in town is done from the town pier, referred to by locals as "the Breakwater," with a peak during the summer mackerel run (Athearn 2008). Many wildlife tours depend on mackerel and other feed fish to attract whales and marine mammals closer to shore. Deep-sea fishing is also

[10] Maine Department of Marine Resources Marine Resources Licensing & Enforcement database, retrieved by Keith Fougere, November 2010 and May 2012.

advertised in Eastport, and Eastport Windjammers has a daily fishing trip on their 35-passenger boat, Quoddy Dam. Saltwater fishing opportunities are clearly linked with tourism.

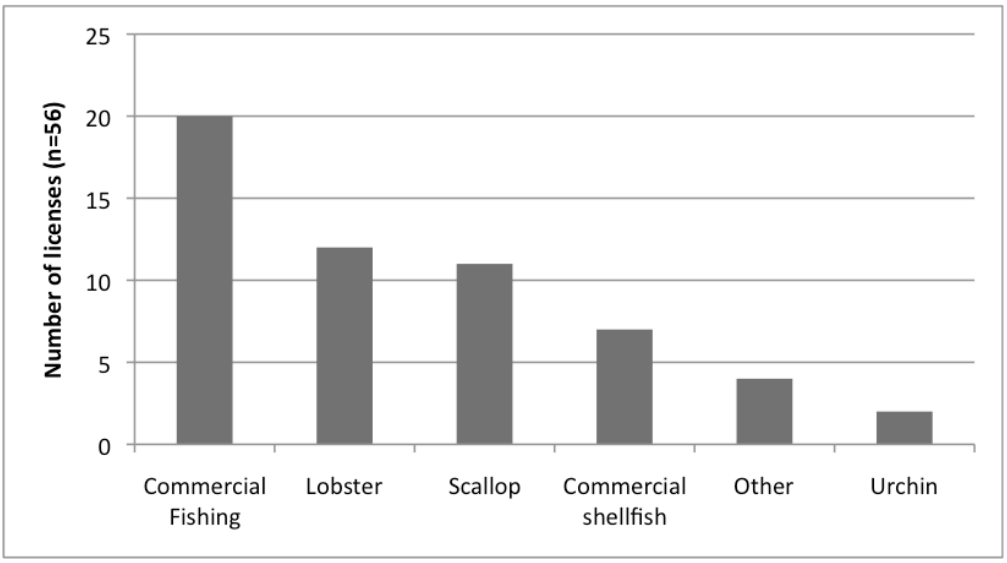
In addition to the commercial and recreational fisheries, there are also extensive salmon aquaculture operations in Eastport. Cobscook Bay's powerful tides help to flush away the waste products of the facilities.

Hall-Arber et al. (2001) reported that tub trawling for finfish (groundfish) occurred from the first of May until the middle of January. Although not practiced today, tub trawlers could bring in several thousand pounds of fish several decades ago (Hall-Arber et al. 2001) and current fishermen often speak of historical abundance of groundfish.

Participation in the fisheries sector

Estimating employment in the fisheries is challenging in a place like Eastport, where few are full-time fishermen and many fishermen using the port may not live within the city limits (NOAA 2009). For example, in the early 2000s, Sheehan and Cowperthwaite (2002) estimated 47 commercial fishermen in Eastport. Around the same time, Hall-Arber et al. (2001) reported approximately 75 (or more) persons who earned most of their income from fishing and another 150 who were employed in the aquaculture industry. They reported that Cooke Aquaculture alone employed around 51-75 persons (Hall-Arber et al. 2001).

One way of illustrating the importance of commercial fisheries in the Eastport is to look at the number of marine resource harvesting licenses issued by the State of Maine (Maine DMR 2011). In 2011, 36 individuals held state licenses in Eastport, down from 41 in 2010. These individuals held a total of 56 licenses, including commercial fishing, commercial shellfish, lobster/crab, scallops, urchins, and seaweed, as well as one dive tender license for scallops and urchins and seven recreational and passenger licenses. However, many fishermen who fish out of Eastport live in neighboring towns, so these estimates underestimate the importance of fishing in Eastport. This does not include municipal clam licenses.



Numbers of state licenses held in Eastport in 2011. Other includes passenger and recreational licenses, urchin/scallop tender, and seaweed (supplemental). Source: Maine DMR.

Similarly, availability of federal licenses is another indicator of the fishing capacity in communities. The following data are reported in the Northeast Region Permit Database.[11] In 2011, six federal permits listed Eastport as either the vessel owner's address or homeport; all held a federal lobster license, while one permit held several licenses (bluefish, dogfish, multispecies, skate, and mackerel). Only one individual listing an Eastport address owned a federal permit for American lobster. The other permit owners listed addresses in Whiting, Perry, and Gouldsboro. In 2001, 11 permit holders listed Eastport as their homeport, while four listed it as their residence (NOAA 2009). The average length of the six vessels with federal permits is 42.5 feet.[12] There are no federal dealers in Lubec listed for 2012.

Fisheries infrastructure

As opposed to most Downeast fishing communities, where catch is landed at one of many commercial docks, most seafood in Eastport—lobsters, urchins, scallops, cucumbers—are landed primarily at the breakwater or private wharves. Clams, periwinkles, and alewives are "landed" at the road closest to where they were harvested. There are also two commercial docks in town that purchase lobster: Quoddy Bay Lobster and Eastport Lobster and Fuel. Another 6,000 square foot indoor lobster storage facility is under construction at the site of a former sardine factory and is expected to be operational sometime in 2012 (Walsh 2010).

[11] Northeast Region Permit Database, nero.noaa.gov/permits/data.

[12] In 2012, only three permit holders listed Eastport as their residence (1) or homeport (2). Those claiming Eastport as their homeport were from Gouldsboro and Perry. All three permits held American lobster permits, while the vessel from Eastport also held a herring permit. These vessels averaged 44.5 feet in length.

Quoddy Bay Lobster has been in operation since 2005. This family-owned business sits on a .59-acre lot along the waterfront with 230 feet of shoreline, parking, and a mechanical hoist on the pier, which has been active working waterfront for more than a century. The company buys lobsters from and provides bait to approximately eight boats. Lobstermen who use the facility are from Eastport, Edmonds, Pembroke, East Machias, and Lubec. Most of the catch is sold wholesale, but the local Quoddy Bay Lobster restaurant and retail market on site holds a permit to pick lobster meat, so some processing also occurs on site. The site's infrastructure includes a mechanized hoist and a wooden wharf, which is currently being renovated. Improvements include new planking and in the future will entail new pilings and possibly an extension farther into the harbor. At present the wharf is difficult to use at low tide. Catch that is sold wholesale is picked up by in trucks by customers. In 2011, Quoddy Bay Lobster Inc. was selected as a Working Waterfront Access Protection Project.[13] The owners plan to use the award to rebuild the pier to allow them to buy from more boats in the area. The business plans to land scallops and urchins in 2012. Plans also include the installation of a new hoist, new pilings, a ramp and float system to accommodate all tide access for commercial boats, and the relocation of their bait storage to the end of the pier. The Eastport Chamber of Commerce recognized Quoddy Bay Lobster as Business of the Year in 2011.

Eastport Lobster and Fuel is Eastport's other lobster buying station that also buys from and provides services for approximately eight fishermen. The site used to be a Stinson's Sardine Cannery, but has been under current ownership for the past nine years and currently buys only lobster. In the past the wharf also served as a site for landing herring, cod, halibut, and scallops. When available the station will also purchase halibut for its restaurant business. Today, it is the only fuel depot in Eastport. The facilities also include a hoist for lowering bait onto lobster boats and a cold-water tank system for storing lobsters. This is also the site of the popular restaurant The Chowderhouse, which, of course, has lobster on the menu. What is not used in the restaurant is sold wholesale and customers bring trucks to pick up catch.

Most other infrastructure and service needs—boat repair, welding, marine supplies, boat storage, haul-out facilities, recreational fishing supplies—are available at Moose Island Marine. The company has two sites in Eastport, the supply store and some boat storage/repair downtown, and haul-out facilities and extensive boat storage on the other side of town at Deep Cove. It should also be noted that many fishermen do their own repairs and maintenance as a cost-saving measure.

The downtown breakwater facility has 77 berths, 91% of which are used by commercial fishing vessels (NOAA 2009). Although Eastport's commercial shipping wharves are

[13] Maine State Planning Office. 2011. Press release: four new Waterfront Access Protection Projects are approved, October 13, 2011, maine.gov/tools/whatsnew/index.php?topic=SPO_Press_Releases&id=311690&v=pressreleases_article.

periodically renovated, waterfront access for fishermen is hindered by the deterioration of the fishing wharves and infrastructure (NOAA 2009). This was echoed in interviews during this research:

> "The breakwater needs extensive work done to it just because it's, again, it was built 40 years ago or 50 years ago and virtually they've done nothing to it."

> "Our only concern is the breakwater. How long is it going to be there before it falls down? They're talking about, maybe in the near future, having something done to it build a new wharf. They've got to do something with it. There's holes in there now that you can drive a truck into."

Fishing industry support institutions

The Cobscook Bay Fishermen's Association is dedicated to the conservation, enhancement and sustainable use of marine resources. Along with the Downeast Fixed Gear Association, the Maine Lobstermen's Association, and Downeast Lobstermen's Association, it represents the interest of some fishermen in the Eastport area.

The Cobscook Bay Resource Center was founded in 1998 to encourage and strengthen community-based approaches to resource management. The Center assists local resource users, scientists, government agencies, educators, and others to monitor and understand the Cobscook Bay ecosystem, with an eye towards economic development based on the Bay's renewable resources. The Center plans to develop a new site near the waterfront, including a marketing co-op and community kitchen.

The University of Maine Sea Grant and Cooperative Extension has an office at the Boat School. The local Marine Extension Team member provides local support to fishermen and other community members, including support to the Cobscook Bay Fishermen's Association.

Cultural attributes related to fisheries and the sea

Site visits to Eastport make clear the cultural importance of fishing to the community. The Eastport Salmon Festival, held annually in September, celebrates the history of the fishing industry and the salmon aquaculture industry. The Pirate Festival also takes place in September. The Fourth of July celebration, lasting several days, has been an important tradition for Eastport for more than a century. Activities over this holiday, such as water sports and a codfish relay, commemorate Eastport's maritime heritage. The city also drops an eight-foot sardine at New Year's, but only after first dropping a maple leaf to celebrate Canada's New Year, which also signifies the cross-border connections of the region.

Fisherman statue (left) and Nature's Grace (right; courtesy of Jim McCleave).

Eastport's Quoddy Maritime Museum has a collection on the fishing history of Eastport. Downtown near the public landing, a 12-foot statue of a fisherman holding a fish was built as a prop for the Hollywood/FOX shooting of *Murder in Small Town X* in 2000. And, more recently, the statue *Natures Grace* was installed in Eastport.

Vulnerability analysis

The level of vulnerability, defined as "susceptibility to harm from exposure to stresses associated with environmental and social change" (Adger 2006), of the fishing community in Eastport is **relatively high** due to many contributing factors and their cumulative effects. However, some fishermen have been able to adapt to threats and **opportunities to improve resilience may be increasing**. Two interrelated components of vulnerability are threats "to humans and the things they value" and responses "incidental or purposeful that occur after experience(ing) a threat" (Tuler et al. 2008).

Threats

The fishing community of Eastport faces a variety of interrelated socioeconomic, environmental, and regulatory changes. Below we describe those sources of change (threats) most relevant to Eastport as expressed in our interviews.

Socio-Economic

Eastport is poorer than the state and much poorer than the nation and has high levels of unemployment. The town was once more prosperous, but the decline of extractive industries in Maine as a whole, and the sardine and canning industries in particular, has caused a decline in population and an outmigration of youth. As one resident stated,

> "Any kids that graduate from school realize in order to make a living you need to leave…I'd like to see more kids have something to be able to stay

> here for, but there's no low paying jobs, there's no high paying jobs. There's just nothing. The economy's drove it so there's nothing here virtually."

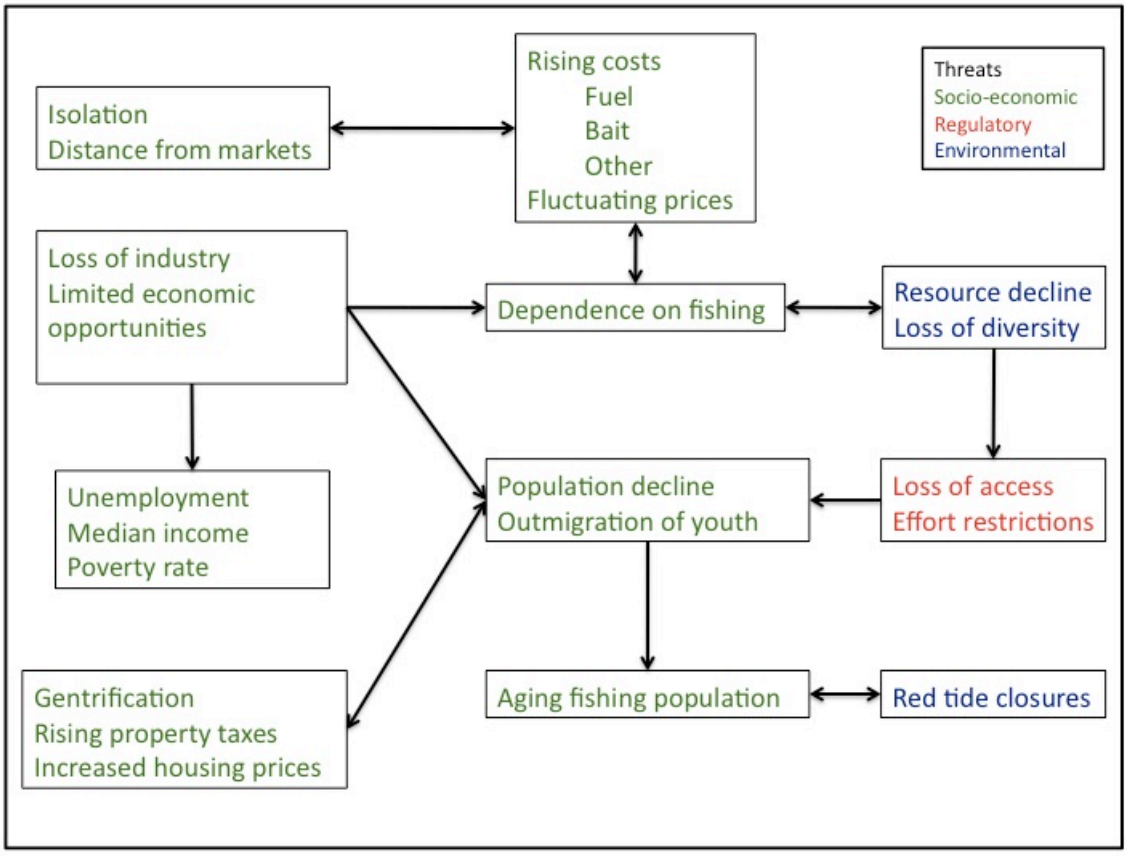
This economic situation has also created an increased dependence on fishing. Most interviewees indicated that the city remains dependent on fishing. For example, one fisherman explained, "A lotta people rely on it. Not just the fisheries itself, the spinoff…boat builders, boat repairs, fabricators, stores, a lotta spinoff."

Increasing prices of everything from houses, to bait, to fuel increases the financial burden on many fishermen. Fluctuations in prices they receive for their catch either offset or exacerbate these costs.

Environmental

Decreases in the population of resources such as sea urchins, scallops and groundfish have reduced fishermen's ability to diversify and adapt to seasonal population fluctuations and price variation in other fisheries. Fishermen mainly attribute this to poor management, or conservation measures that were "too little, too late" and allowed overharvesting of the resources. This reduction in resources has led to an increased pressure and dependence on fewer fisheries. While not as dependent on lobster as most communities in Maine, participation in the lobster fishery in Eastport is increasing, raising concerns about future lack of fisheries diversity. One fisherman explained the decline in resource diversity related to the collapse of the groundfishing stocks:

> "The loss of the groundfish…now (there) is really no groundfishing in eastern Maine…And so more people are lobstering here and there's quite a bit more pressure now in the scallop fishery, urchin fishery because of that. So where before you had a greater choice for diversification, spread out in the fisheries and now there's greater impact on just a few fisheries which it makes it much harder for those to be sustainable."



Socio-economic, regulatory and environmental threats facing Eastport.

There is also concern regarding additional harvest pressure on the scallops in the Bay from non-local boats with less incentive to conserve the resource for future generations. Red tide closures are also common in Eastport and can devastate shellfish harvesters.

> ”It seems like clams will run between $1.00 and $1.50. You might be getting $1.20 here, down the Western end they might be getting $1.40, $1.50. And then just before the big rush, Fourth of July, boom red tide’ll hit here, boom, their clams are going $2.50, $2.65 a bag. You’re sitting here with your hands tied ‘cause you can’t fish, can’t dig. And they’re getting the tourist price.”

Regulatory

A government response to resource decline, moratoriums on licenses and regulations to reduce fishing effort are a major threat to the future of the fishing community in Eastport. This concern was pervasive throughout the interviews. As an example from an interview with one fisherman:

> “You gotta jump through hoops and breathe fire to get in the fishery now. You can’t get a scallop license or urchin license and you have to apprentice

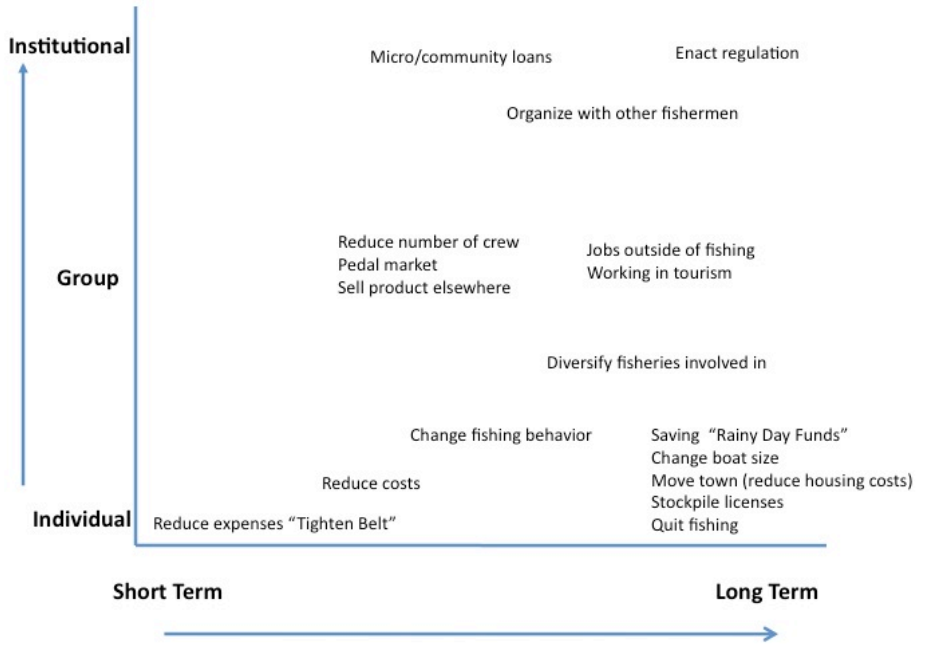
and log days and hours to get on a waitlist and will be dead and gone before (you) ever gets into lobstering."

These regulatory restrictions combined with the aging population structure of the community have many fishermen worried about the lack of young people entering the fishery. When asked about the future, several fishermen expressed pessimism about the next generation: "Fast forward 100 years and it would be pretty good fishing, or we'll be died off and nobody else will be doing it." Similarly, one fisherman explained, "You know, kids can't get a license, so I mean it's gonna die."

At one time fishing provided a livelihood for many young families, but with limited entry, few if any have the opportunity to enter the industry. Combined with the general lack of economic opportunity in the area, many young people are forced to leave for a higher education and then find employment elsewhere. The aging demographics of Eastport, like many Maine communities, and limitations on entry reduce the prospect of another generation entering the fishery.

Responses

The ability of fishermen to respond to these threats varies, as some are simply beyond their control. For those that are within their ability to respond, respondents reported a variety of long-term and short-term strategies.



Short and long-term responses to threats.

Occupational Pluralism

> "All the fishermen that fish always have something else to fall back on. I mean some of the guys cut wood, some of them have other jobs."

Many fishermen in Eastport expand their employment to opportunities available outside of fishing. As an example, while the increase in tourism may pose a threat to the fishing community in terms of loss of access to waterfront it may also have a positive effect in the creation of more opportunities outside of fishing. One commercial fisherman has been successful setting up recreational fishing charters and a windjammer cruising business that would not be possible without tourists.

Organizing

In 2000, fishermen organized the Cobscook Bay Fishermen's Association to promote the "conservation, enhancement and sustainable use of marine resources in Cobscook Bay." This organization played a vital role enacting conservation regulations in the scallop fishery including lower quotas and meat counts. Some concerns were expressed in interviews about the representation of the association for fishermen, with some fishermen feeling that the group does not adequately represent them. As one fisherman explained: "Unfortunately there's not many fishermen that…get involved in it…To me you need a bigger body to really represent the fishermen 'cause it comes almost down to personal interest and that scares me."

Fishermen are increasingly emphasizing the need for local management to respond to changing resources. In one fisherman's words: "I think it should be stressed, and I think more people are realizing that it should be more community based, the fisheries in the communities…and local area management."

Reduced Prices/Increased Costs

Some fishermen have been able to cope with reduced prices by selling directly to the consumer or by adding value to their product. These opportunities should increase with the construction of Cobscook Marketplace, a project currently under construction by the Cobscook Bay Resource Center that will house a marketing cooperative and provide business and entrepreneurial training and assistance to local fishermen.

Many fishermen respond to changes that increase costs (such as fuel or bait prices) by changing their fishing behavior. To save on fuel they will steam slower, ensure they are steaming with the tide and/or fish in locations that are closer. Lobster fishermen will leave their traps out longer or reduce the frequency with which they replace bait. To reduce repair costs, they will do boat repair and maintenance themselves:

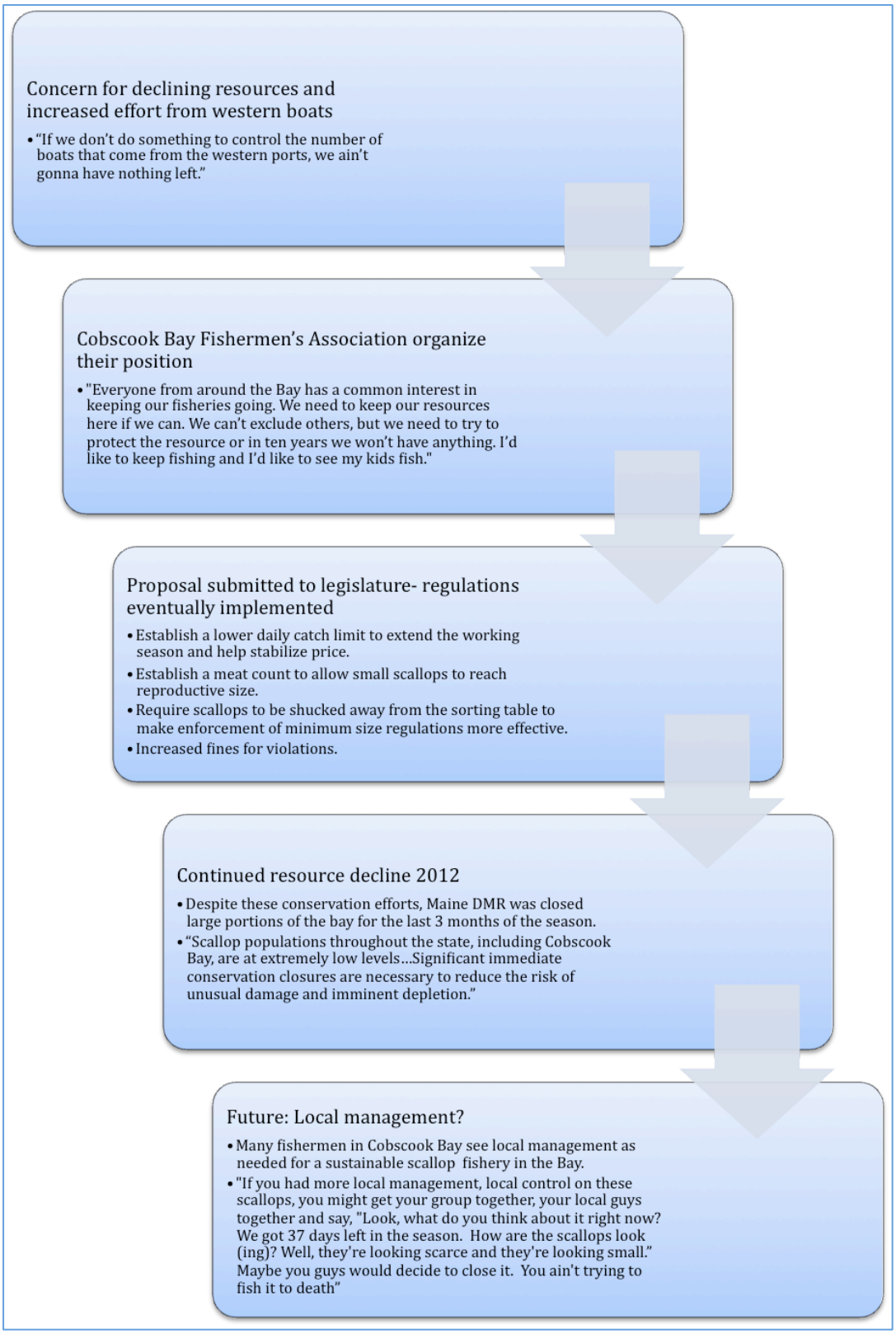
> "Around here, most of the fishermen here, they do a lot of their own work. They have to…I mean they maintain their own equipment, do their own repairs, and you know, you have to be self supported or you just couldn't – you couldn't afford your industry."

Those who have the financial means will try to save money. As one fisherman explained: "A smart fisherman always sets money from the good years so they can survive the bad years." Those who don't have this "rainy day fund" will respond to hard times by reducing expenditures and living frugally.

Quit Fishing

> "The breakwater used to have, I don't know how many boats were in there, but in the last…probably lose three or four boats a year on average."

There are some threats that, when considered cumulatively, fishermen have been unable to cope with or adapt to and have been forced out of the fishing industry completely. This is obviously, for most fishermen, a decision only made as a last resort. Some of these people are older fishermen who retire, others get other jobs outside of fishing, and others move away from town.



Fishermen's response to scallop decline.

Summary

Eastport is a community in transition. While some residents consider fishing to be an integral part of the community, others feel that since the closure of the sardine factories only a fraction of the community continues to be involved in fishing. One longtime Eastport resident stated: "I don't think there is any fishing here…I don't know anybody in that now. Growing up, I didn't know anybody that wasn't." Among those who still consider Eastport to be a fishing community, there is an acknowledgement that it has declined significantly. However, there is widespread recognition of the need to maintain some semblance of the tradition and culture of fishing in the community. One resident explains the transition as follows:

> "There has been certainly a shift towards more of the creative economy…I think the aim is to try to have that work and mesh also with more traditional parts of the economy, the fisheries, and aquaculture here and tourism. And I think it's possible for all of those to coexist. But I think it will continue to be a struggle."

Eastport faces many threats that will make this transition difficult. Key among these are a reduction in resource abundance and diversity, a declining and aging population, and lack of economic opportunities. While people recognize the need for growth, particularly creating job opportunities for young people, many are concerned with the implications of increased growth, and how this may affect future costs of living and their ability to stay in the area.

Despite these diverse hazards, many people are hopeful for the future and point to key aspects of the community that will help facilitate this transition including the natural beauty of the area, a workforce that is willing and able to work hard if an opportunity arises, and a sense of camaraderie and cooperation within the community.

> "I think there's a remarkable partnering that's going on in this community and I think there's also a remarkable willingness to re-think some things and being fairly open to some newer things. And I think that is what is helping to at least position this area for what I think will eventually be some growth…"

Only time will tell if this growth occurs and how it will affect the community as a whole and more specifically the fishing community.

Recommendations

- Promote tourism and creative economy to take advantage of the limited summer season and create economic opportunities while maintaining traditional aspects of the fishing community.

- Effectively communicate importance of fishing heritage and waterfront access to tourists and amenity migrants.

- Utilize Eastport's unique opportunities due to its natural settings, such as tidal power generation and the deepwater port, to diversify opportunities outside of fishing. Consider options of local management to increase diversity of fishing opportunities.

- Explore ways to address limited entry issues and create opportunities for new entrants.

- Preserve working waterfront: Maintain/upkeep existing infrastructure and identify opportunities to create new working waterfront access areas.

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