

# Shellfish Focus Day Listening Session

A Summary report of stakeholder perspectives on bivalve shellfish conservation, management, research, and monitoring in Maine



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Prepared by the Shellfish Listening Session Steering Committee:

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## Introduction

Shellfish Focus Day is typically the first day of the Maine Fishermen's Forum (Thursday), and this year occurred on March 1, 2018 in Rockport, Maine. The agenda for Shellfish Focus Day focuses on bivalve shellfish, wild and aquaculture, and is an opportunity for presenters to give updates on the latest in science, management, outreach, and education throughout the state. While there are several social events during the Maine Fishermen's Forum, 2018 was the first year a research-focused networking event was held during Shellfish Focus Day. This report describes the planning and results from this networking event, the Shellfish Research Needs Listening Session.

The idea for this event originated from results of a University of Maine evaluation of attendees from the 2017 Shellfish Focus Day, which indicated a desire for more time for networking, questions and answers (McGreavy et al., 2017). Building on these suggestions, and an initiative to broaden awareness of ongoing research and pair the research community and municipalities with members of the industry, a Steering Committee formed to plan the Shellfish Research Needs Listening Session.

The **goal** of this Session was to identify needs in the shellfish fishery and facilitate a collaborative approach to research between the shellfish industry and the research and management community. This information is being distributed to municipal shellfish or marine conservation committees, research institutions and universities, Maine Department of Marine Resources (DMR), and nonprofit organizations in an effort to prioritize, fund, and implement suggested initiatives.

The **outcomes** for this session were to:

1. Identify current needs and priorities of the Maine shellfish industry and generate ideas and projects that depend on collaborative problem solving and partnerships to develop long-term solutions.
2. Develop an initial list of industry members, researchers, and managers interested in working on these projects.
3. Gauge interest in continuing this effort in future networking and learning events.

## Methods

Following the formal presentations and panel discussions for Shellfish Focus Day, the moderator (Ms. Joyce) provided brief opening remarks and instructions for breaking into small groups for discussion. The four group topics included: Public Health, Environmental Change, Conservation and Management, and Health and Economic Resilience. Details on the focus of each group were provided to the audience. Each group was facilitated by a practitioner in the field with content expertise, and accompanied by student note takers.

Attendees were given time to get refreshments before the small groups started, and the groups convened for approximately an hour. The group discussions were informal, and attendees gathered around high-top tables or in a large circle. Facilitators had questions they prompted, though by-and-large, the conversations were free flowing, with a lens towards developing collaborative project ideas and identifying research needs. Facilitators circulated a sign-in sheet to record attendance. Post-it notes were provided for attendees to share written ideas, though most attendees participated verbally.

More than 30 people joined the small groups, with some floating to multiple groups within the Session.

Prior to the Session, the Steering Committee distributed a Research Compendium – a handout listing a snapshot of recent and ongoing research in the Maine bivalve shellfish fishery and ecosystem. The Research Compendium is available online: <https://bit.ly/2KtuM0I>

### Findings

This section summarizes the discussions and recommendations from each of the groups, as recorded by the note taker and facilitator of each group. Discussions are in narrative format, and specific recommendations are bulleted.

The discussions and recommendations presented in this section reflect the information shared by the individuals in that particular group. Ideas are generally not identified to the person who contributed them, though as much as possible, ideas are identified to the sector of industry, scientist, or manager. Therefore, the views and ideas reflected in this report are not intended to be representative, and have not been checked for accuracy. Instead this information intends to serve as summary of a range of interests and to inform future discussions and coordination.

There are several themes that emerged across the small group conversations:

- Researchers, managers, harvesters, dealers and growers have similar concerns about changes in the ecosystem, water quality closures, and the future of the industry.
- While there are a handful of towns and/or local partnerships actively addressing some of these issues, information on the tools, methods, and results from these studies or conservation initiatives are not yet widely available.
- Maine DMR has been adapting some of their monitoring and testing regimes, specifically with respect to biotoxins; though there is still concern in the industry about what the short- and long-term economic and biologic impacts biotoxin closures and other closures will have on the industry.

- While there is steady ongoing research on many of the issues facing the bivalve shellfish fishery and intertidal ecosystem, there are still many unknowns, and funding at the local, state and federal level is limited.
- There is the desire to use innovative approaches to collect clam spat and increase survival in the face of predation.
- There is interest in using technology and citizen/industry scientists to increase capacity and collect more data locally to support municipal management decisions now and in the future.
- An increasing number of towns are collaborating with municipal shellfish commissions, local schools, and scientists to address the pressing research needs in their community.

### Public Health

The Public Health group had four attendees sign in, including two oyster and/or kelp growers, as well as a scientist and a DMR employee from the Board of Pesticides Control. Kohl Kanwit, Director of the Maine DMR Bureau of Public Health, also joined the group.

This group started with a conversation around harvesting closures due to harmful algal blooms and water pollution. From an aquaculture business perspective, harvesting closures interrupt their ability to supply their buyers. However, one attendee noted that this does not typically result in large revenue impacts to their operation, as revenue delayed (rather than forgone). In this group, there was support for Maine DMR's approach to testing, closures, and communication of this information.

A conversation followed around the Limited Purpose Aquaculture (LPA) License process that DMR has authority to manage. While LPAs have multiple purposes, from research to recreational and commercial grow out, one attendee expressed their opinion that LPAs are intended to be exploratory and experimental to gauge suitability of a site, species, and/or technique for a future aquaculture lease. This person commented that, "DMR should reign in the LPA process" as it's now being used to build entire businesses.

- There was a recommendation to increase public opportunities for input into the LPA approval process, perhaps through holding public hearings (similar to the process for a standard lease).

The facilitator inquired about changes the attendees have seen in public health. One attendee noticed there have been more efforts to reduce overboard discharge (OBD), and that aquaculture leases can also serve as a 'Canary in the Coal Mine' to alert the State to OBD. Another attendee suggested that not having a 24-hour *e.Coli* test is a potential weakness in the system. There was a question about the availability of grants to increase monitoring water quality in certain areas (for example, around LPAs).

- There was a recommendation to increase the testing regime for P90 (fecal coliform, *e.Coli*), particularly because of new challenges presenting with climate change.
- There was a recommendation for DMR public information about pollution to be more accessible.

### Environmental Change

The Environmental Change group had eight attendees sign in, including several harvesters/fishermen, an oyster grower, several researchers, and representatives from nonprofit organizations. There was a discussion among several attendees of the group interested in designing experiential research with College of Atlantic students involving multi-trophic aquaculture, potentially with seaweed and mussels and/or oysters. Nichole Price, a researcher from Bigelow Laboratory for Ocean Sciences (Bigelow), provided some ideas on how to incorporate measurements of carbon uptake by kelp that could lead to enhanced growing conditions for shellfish at the site. The conversation continued to cover other short-term projects around growth rate and biomass of kelp, and the potential for partnerships with a research institution to supply technical tools and information to conduct this research. There was further discussion on how to design this research project with monitoring parameters, duration, and cost estimates.

Island Institute and Bigelow are collaborating on a project to understand if kelp aquaculture can locally remediate ocean acidification and create improved growing conditions for co-located mussels. The Schoodic Institute is conducting a biomass study using light meters to determine how much rockweed can be sustainably harvested. Hurricane Island Foundation is also working on a research project with kelp in Frenchman's Bay and potential uses for kelp in the market.

This opened up the conversation to domestic and international kelp production and markets. There was an acknowledgement that kelp disease is understudied. Also, there is not a competitive market for seaweed or algae-based biofuels, thus there is a need to find alternative markets. The University of New England received a grant to research the feasibility of offshore kelp aquaculture with the goal of production for food, biofuels, and bioplastics.

A lobsterman in the group discussed changes he has seen in the industry, and commented on the increase in small lobsters after cod started decreasing in the 1980s. He also noted the amount of pollution, and particularly plastics increasing in frequency. Another change he noticed is female lobsters spawning at younger ages. He thought that training for young fishermen around overcapitalization was a priority.

Another attendee was interested in the effects of ocean acidification (OA) on soft-shell clams and how best to conduct student monitoring for impacts of OA in

mudflats. He mentioned similar ongoing efforts of pH testing of water in mudflats, for example Friends of Casco Bay, and other organizations.

- There was a recommendation to work with College of the Atlantic, Maine Maritime, and/or a motivated high school to seek funding and engage students in pH testing of mudflats. There was a suggestion to include a teacher at Sumner High School who designs curriculum and could be a great contact.

There was a discussion around green crabs, predation, and the effect of warming temperatures on the green crab population. With aquaculture, there was a question around how to respond to these changes? Attendees shared that mussels grown on lines seem to be okay and oysters floating in cages aren't being affected, but green crabs are preying anything on the bottom on. There was a sentiment expressed that the more soft-shell clams recruited to an area, the more green crabs are attracted. One attendee inquired whether growing clams out to the edge of market size to maximize spat production would help tip the scales and outcompete predators.

A discussion followed around options for growing soft-shell clams in baskets, though the attendees didn't know a lot of details around this method. There was talk about growing clams similar to oysters, with a tray and a small mesh size; however, the value of the two species (\$0.50/oyster vs. \$0.05-\$0.10/clam) indicates utilizing this type of gear for clams would not be economically feasible unless the value were higher.

### Conservation and Management

The Conservation and Management group was the largest group with 11 attendees signed in, in addition to several researchers who didn't sign in. The representation of this group included a shellfish harvester, a mussel aquaculturalist, several researchers, a funder, DMR biologists, and representatives from nonprofit organizations.

During the introduction, several attendees shared their observations from milky ribbon worms and predation being an issue in Scarborough, to ocean acidification and clams dying off in Hancock County, and utilizing recruitment boxes to increase productivity of clam flats in Frenchman Bay. Attendees acknowledged there is ongoing research and monitoring, and that scientists want to make the most of their investments on the clam flats. Both wild harvesters and growers want to address the issues in the industry for long-term sustainability and preservation for future generations.

When prompted about issues of concern, one attendee mentioned that they worked with town conservation programs, and put a lot of effort into green crab trapping, netting, and monitoring. However they realize that many other towns don't have the resources for similar efforts, and it's important to communicate to other towns how to conserve the resources and conduct experiments. There was recognition that it

takes a lot of time and money to utilize recruitment boxes and then netting once clams are transferred from boxes.

- There was a recommendation for towns to record and take more surveys of their resources.

A discussion followed from the Waldoboro presentation around cleaning up sources of pollution to keep their clam flats open more than half the year. Conditions are very local, and the problems in one town may be very different than the next town. However, a theme of Shellfish Focus Day has been empowering towns to build capacity, including a cooperative model to purchase/use recruitment boxes through bulk pricing.

One attendee mentioned an example of utilizing oyster-grow cages over the last two years and leaving them out to foul (as part of an aquaculture education program). They found that the cages were collecting soft-shelled clams at subsurface depths, and in 2018 they are expanding their experiment to collect more information. There were some questions around growing clams out in the cages verses using the spat to plant elsewhere. This was a location where green crab predation was not too much of an issue. Another attendee suggested one might be able to use scallop bags to collect clam spat as well.

A discussion around milky ribbon worms followed, which is a very regional issue; for example, there are worms in Scarborough, Freeport, Brunswick and Harpswell, but not in Georgetown. There was a question whether there is seasonality to worms, though they are thought to be year-round. Attendees mentioned that ribbon worms don't affect mussels, only clams. Harvesters in Scarborough are collecting data for the University of New England (UNE) on where they are finding worms, the number of clams present, type of soil, etc. The town is trying to determine how many licenses to add or subtract based on this research, but it's taking a while to figure out this equation.

Leadership in towns and training people is key to conservation activities. There was an example of municipalities working with volunteers to seed and net, and training them on the methods, so they can train others to come the following year. One attendee mentioned that education and leadership starts with the shellfish wardens.

There was a discussion around predators and how one can scale up the recruitment (also known as Beal) boxes. There was a question about growing clams to size in the recruitment boxes, and it's unknown whether this approach would work with soft-shelled clams. Research indicates soft-shelled clams need a lot of pressure on top of them to keep their shells closed, but not too much as to crush them.

There was a brief conversation around razor clams, which are challenging to harvest because they are so fragile and inconsistent in the flats.

Wild harvest and aquaculture are both needed, and both industries need to address predation. There is incentive for aquaculturalists to protect and manage their specific lease sites.

The facilitator posed a question to the group about hearing that we're all doing the same experiments over and over, and whether individuals have the research and information they need to get the towns' support? One attendee mentioned it's a cultural difference, and another mentioned that towns in Southern Maine are more conservation-minded, while some Downeast towns have only recently started working with their communities. Strength in numbers (i.e., the number of active clambers) helps for support through town committees or research institutions. The Downeast Institute (DEI) has been a helpful resource to get information out. One attendee mentioned supporting the co-management effort between the state and municipalities as opposed to fishery managed only by the state.

- There was a recommendation to hold more gatherings like the listening session to bring harvesters from around the state together with researchers and managers (or to hold meetings at a regional level).

Attendees were asked about specific projects or ideas that need more attention or funding. A conversation pursued about whether you can raise clams in bags suspended in the water column. Another thought was around whether data are available to compare licenses and shellfish landings with surveys, to be able to predict how many clams will be harvestable in future years. There are records of the number of licenses in each town, as well as landings, but the per-unit effort is unknown. One attendee suggested getting dealers involved, as they have tags and traceability software. The dealers can help track the per-unit effort over time with a public-private partnership with the State.

- There was a recommendation to experiment with raising clams in bags suspended in the water column.
- There was a recommendation to integrate clam landings data with aggregate harvester data from dealers to understand the per-unit effort of clam landings.

A conversation followed around the access to licenses and the number of licenses a resource can support. Some commented that it's not easy to get a license with many towns having limited licenses, and some of those being reserved for students. The students can dig more than some of the older diggers, though it does encourage the next generation to get into clamming. Attendees acknowledged that as clam resources decline, towns are phasing out licenses (or decreasing the number of available licenses).

- There was a recommendation to promote student licenses to allow a younger generation to learn the trade.

The wrap up conversation for this group focused on the utility of volunteers to help protect the clamming community and jobs (provided that clamming is a proxy for

clean water, and good conservation and management). While resources may vary from town to town, there is agreement among stakeholders that clean water is paramount, and clambers do their part to keep water clean.

While the following ideas and recommendations were shared during a Shellfish Focus Day handout and presentation by Dr. Brian Beal, they are related to this topic, and included here for reference:

- Consider areas with water quality closures as a source of spat, as larger clams that have outgrown predation risk can produce large amounts of spat. Stagger openings of previously closed areas to ensure larger clams do not get rapidly harvested.
- The industry should consider developing broodstock clam sanctuaries, similar to those for mussels. There's also a need to address the uncertainty about how far (and where) spawn from Downeast travels.
- Implement an upper size limit of 3.5 inches for soft-shelled clams to protect broodstock.
- Increase local capacity through expanding beyond the passive enforcement management approach to an active management approach.
- Utilize an Adaptive Ecosystem-Based Fisheries Management approach to address predation.
- Implement large-scale clam protection projects via conservation hours and leasing.
  - Utilize flexible netting (where milky ribbon worm populations are low)
  - Utilize clam recruitment boxes (with mesh above and below the box) to protect against both green crabs and milky ribbon worms.

#### Health and Economic Resilience

The Health and Economic Resilience group had six attendees, including a mussel aquaculturalist, a shellfish dealer, a fisherman, several DMR staff, including a shellfish inspector, and a college student. This group started talking about infrastructure improvements. There is a need for better processing and depuration infrastructure in the State to support the shellfish industry. Local depuration infrastructure and testing labs are especially needed with the rainfall closures in Downeast Maine. Funding is a real obstacle to addressing these problems. The attendee (an aquaculture business owner) noted that the suggested solution should come from the industry itself instead of coming from the regulatory body.

This group also discussed shellfish resource [biological] surveys. For areas where there are reports of limited clam resources, there are ideas to utilize existing technology to track clammer's harvesting activities to monitor the location of the resource. There were several recommendations, though there was also information shared about the use of monitoring technology in the mussel and lobster industries that was not favored by industry members. One attendee mentioned that clambers would be unwilling to use such technology.

- There was a recommendation to use drones or cell phones to record effort in specific locations. This recommendation connects with a broader interest in exploring innovative technologies and the use of citizen monitoring to collect important information about environmental change and shellfish populations.
- There was a recommendation to include harvesters in the resource surveys, and members of the group brainstormed multiple ways that this could be achieved, including how to encourage voluntary participation in data collection by making sure that the information collected is accessible to and serves the harvesters and the towns.

Further on monitoring and surveys, an attendee mentioned the need for information around where the clams are (and not just where the clammers are). There was a discussion around siting of digging around other effort, resulting in popular sites that may or may not still have remaining resources. An attendee raised a question about incentivizing harvesting clams in less popular areas where you can still make a profit. While there was recognition that the science in this area needs to be improved, it was understood that it would be onerous to collect this data. There was a question about the number of bushels that can be extracted from an area without overexploiting the resources. A state employee mentioned that there would be too many regulations necessary if monitoring is applied at the individual level, and inquired how the number of licenses issued might be limited.

### Next Steps

This full report is being distributed to shellfish stakeholders, the research community, the Shellfish Advisory Council, and Maine DMR. A shorter technical memo has been distributed to municipalities with shellfish conservation commissions. These municipalities will also be provided with a link to the Research Compendium and the YouTube videos of Shellfish Focus Day presentations.

Results from the 2018 Shellfish Focus Day evaluation will be used to plan next year's agenda, and weigh the approach to another networking event.

Videos of the presentations from Shellfish Focus Day are available online:  
[https://www.youtube.com/playlist?list=PLMRkRrSVKicotJn\\_2yeBcV\\_2N3zsi0sEp](https://www.youtube.com/playlist?list=PLMRkRrSVKicotJn_2yeBcV_2N3zsi0sEp)

The date for Shellfish Focus Day in 2019 is February 28<sup>th</sup>. Information on the agenda will be available in early 2019 on the Fishermen's Forum website:  
<http://mainefishermensforum.org/>

## Literature Cited

**McGreavy, B.,** Page, C., Quiring, T., & Hathaway, C. (2017). Fishermen's Forum Shellfish Focus Day evaluation and recommendations. Technical report provided to the Maine Shellfish Advisory Council and the Maine Department of Marine Resources.

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