Improving Seafood Quality to Increase Value of New England Finfish

A Summary of Current and Best Quality Handling Practices, Opportunities, and Challenges

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Gulf of Maine Research Institute

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Acknowledgements

This report summarizes the results of a project focused on understanding and improving finfish quality across New England, led by the Gulf of Maine Research Institute in close partnership with the Cape Cod Commercial Fishermen's Alliance and the Maine Coast Fishermen's Association.

We want to thank the many fishermen, processors, offloaders, and seafood supply chain members from across New England who participated in this project.

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Resource Hub

Please visit the **Fish Quality Resource Hub at** gmri.org/quality for a range of resources and more detailed information on best practices for quality handling, costs of different practices, detailed summaries of species-specific experiments, a financial tool for fishermen, videos on quality handling best practices, and more.

Introduction

This report shares the results of a USDA Regional Food System Partnership project between the Gulf of Maine Research Institute, the Cape Cod Commercial Fishermen's Alliance, the Maine Coast Fishermen's Association, and many fishing and seafood supply chain businesses across New England. Our partnership shares the goal of achieving a resilient regional seafood system by building value and demand for seafood from New England. Regional seafood represents a great opportunity to provide a healthy, responsibly harvested, climate-smart source of local protein, while supporting strong coastal communities, resilient seafood supply chains, and thriving fishing families. Despite the healthy, abundant fisheries available in our region, regional finfish faces challenges when competing with inexpensive, imported seafood. Our focus has been on the opportunities to build and strengthen infrastructure and best practices to improve quality and value for finfish, and to build awareness and demand for regional seafood. The opportunities, as well as the challenges we face, align with the focus of Executive Order 13921: Restoring American Seafood Competitiveness to improve the promotion and marketing of U.S. seafood.

A challenge our region faces is that quality and handling of finfish in New England is inconsistent across the fleet when compared with other regions of the world harvesting similar species at much larger scales, like Alaska, Iceland, and Norway. These other regions are much larger geographically than New England's waters and have developed large-scale at-sea processing and sophisticated freezing technology, resulting in high quality, consistent product. Additionally, these regions have implemented standards for seafood handling that are applied across their supply chains.

Even with our abundant, healthy fisheries, New England does not have the scale of fish available in the water to support these factory-style vessels and operations. Our fishing fleet is decentralized (i.e. not vertically integrated), aging (both in terms of people and infrastructure), and made up of small and mid-size boats with no freezing equipment and a lack of incentives to invest in upgrades. Finfish from our region tends to get lost in the larger commodity marketplace and the industry needs investment in order to change.

It is a challenge for regional seafood processors to rely solely on local product to keep their facilities running, which in turn, makes it hard for local fishermen to compete with highly available and affordable imported product. There is a vicious cycle of inconsistent availability and inconsistent quality that make it challenging to shift away from the historic large-volume, commodity-scale mindset of New England's finfish industry from past decades and move towards a 21st-century fishery that focuses on high quality, smaller volume, and higher value.

Given that finfish from New England can no longer compete in the commodity marketplace on *quantity,* the opportunities going forward are to compete on *quality* and to build demand for high quality local seafood. Building a new reputation based on high quality and creating targeted demand from restaurants, institutions, and retailers in New England can help to create more consistent demand for

seafood specifically from this region – and is vital to keeping up with the sophistication of the global regions competing against local product.

Through this project, we took steps towards this vision of the future by:

- Assessing current practices from fishermen and processors, and identifying where they see opportunities for investing in quality and value
- Testing and identifying best practices for finfish quality
- Establishing objective measures of quality
- Identifying a range of low-to-high cost investments that would make a difference in quality
- Convening retailers, restaurants, and institutions with fishermen and processors to explore solutions for moving forward

This work is far from over, but this project's results show that there are ways to move towards a different future for the industry, which some fishermen and processors are already embracing. This project created a shared understanding of what high quality means and reasonable investments the region can collectively make to increase value over time. By sharing this work and the value of starting with low-cost changes, fishermen could begin to see higher prices for their catch, which would benefit individuals and the industry as a whole.

> *"We're bringing in Icelandic fish because of quality – it's ice cream white, not off white… We're paying more per pound for that fish cause of quality – I would love to do something similar here."*
> *– a New England seafood processor*
>
> *"Everybody thinks they're producing a high quality fish, to a man. There's nobody who thinks they're not doing as good a job as the next guy. The worst guy thinks he's doing the best… even though the dealer won't buy his fish. We don't know who is the worst, but we all think we're him [the best]."*
> *– a New England fisherman*

Interviewee Details: Fishermen and Processors

The project team interviewed 21 fishermen from across New England (Maine, New Hampshire, North Shore of Massachusetts, and Cape Cod, Massachusetts), representing a range of gear types, vessel sizes, and target species. The team interviewed captains using pot/trap gear to fish for black sea bass, longline and jig gear to fish for various groundfish, black sea bass, mackerel, and dogfish, and both dayboat and trip boat gillnetters and trawlers. Gillnetters and trawlers in the Gulf of Maine were fishing for groundfish, including monkfish, and occasionally dogfish. Gillnetters in southern New England were targeting skate, monkfish, and dogfish. It should be noted that fishermen were chosen for interviews based on the project team's knowledge that they had an existing focus on quality and taking good care of their fish. This was purposeful so that we could understand existing practices from those who have valuable experience and to share out more broadly about their strategies.

We also interviewed seven seafood processors from across the region, representing a range of small to large operations and selling a diversity of species (local and non-local). They spanned New England, from Portland, ME, to New Bedford, MA.

Questions for fishermen focused on understanding how they evaluate quality of their own product, how they handle fish on board to maintain or improve quality, how they pack and store fish, how they navigate the market, and where they see the biggest challenges and opportunities when it comes to quality and value for themselves and the broader fleet.

Questions for processors focused on understanding how they evaluate quality and whether they use any standards for assessing quality, how they make sourcing and pricing decisions based on quality, how quality impacts their bottom line, and where they see challenges and opportunities when it comes to quality and value for the region's finfish industries.

Supply Chain Strategy Sessions

After completing the interviews of fishermen and processors, the project team held a series of workshops that reached 71* supply chain members from across New England. This included the following types of businesses and organizations (see Table 1).

Type of business/organization	Number of participants in workshops
Fishermen	9
Seafood processors/distributors	11
Seafood retail markets	7
Retailers/grocery stores	4
Restaurants	20
Institutional foodservice (K-12, college dining, hospital dining)	15
Nonprofit support/technical assistance organizations	5

*Table 1. Participation in seafood supply chain workshops. *Note: Some participants' businesses fall into more than one category, i.e. they have both a market and restaurant, but they are only counted once in the table.*

Project learnings were shared at these workshop sessions and then participants spent time strategizing about opportunities, challenges, and potential next steps for all involved to be able to sell/source more regional seafood. Those results are shared later in this report. Below are quotes representing some of the conversation themes from the workshops.

> *From Workshop Participants:*
>
> *"We need liaisons between restaurants and fishermen to help the line of communication about availability and what's fresh and exciting." – Boston area chef*
>
> *"I'm taking what I've learned here to influence decisions I make about the direction of the menu and utilizing lesser utilized catches." – Boston area chef*
>
> *"Summer tourists actually eat way more monkfish and other fish than locals." – Portland area chef*
>
> *"Let's project more strength and positivity – like 'there was a big haul today!' rather than 'it's desperate times for the fishing industry.'" – New England seafood processor*
>
> *"We should never describe fish as too bony, or too hard to handle – like scup should be described as a delicious white fish, not with a qualifier up front that they're bony." – Boston area chef*

Today's quality handling practices in New England on finfish vessels

The fishermen interviewed were a group with an established interest in good quality handling. However, there was variation in the details of this group's practices across a diversity of vessels and target species – which points to the likelihood of even wider variation across the whole fleet. Below is a brief overview of the themes heard in the interviews about common practices today.

Chilling: Fishermen interviewed use a range of chilling methods, with a mix among the group of those using ice only and those using some type of slurry. There are varying recipes for creating a slurry – but the basic definition is using ice and seawater. A smaller number use a brine, which is adding extra salt to an ice and seawater slurry. For those only using ice, there was variation in how much ice depending on the value of the species targeted. For example, fishermen layer ice throughout the bottom, middle, and top of the catch for more valuable fish, but not for species that tend to receive lower prices.

> *"I bring lots of ice. I brine the fish into the tank – two coffee cups of salt, a five gallon pail of water, 300 pounds of fish and 150 pounds of ice. Water goes from 32 to 28… the fish come in pristine. I don't get any more money for doing that – I do that because I want to deliver the best product possible." – New England fisherman*

Handling and storage: There are a variety of methods and different orders of operations across the interviewed fishermen for cutting, gutting, chilling, and packing of fish. Very few species are being bled. Heading and gutting is much more common, but also depends on the species. There is very little use of cutting machines across the region, but some larger vessels have invested in this type of equipment that's common in other parts of the world. There is also variation across a handful of storage methods, including different sized totes, vats, as well as fish holds, but many in this group were using insulated containers.

> *"I want the fish on the bottom in the fish hold to be as pretty as the fish on top – not squeezed, not pock marked from the ice (pock marks are little round dents from the ice). I focus on more ice, shorter tows… layering them belly down is better than laying them down on their sides." – New England fisherman*

Investments in Quality by Fishermen

There are several examples of what this group of fishermen have done to invest in producing better quality product on their vessels, both in time and money. Some of these practices are much less common across the larger fleet. Additionally, some of these are long-term investments that fishermen are still doing or that they still benefit from (e.g. ice machines), while others were not worth it (e.g. the time/effort to bleed fish) due to a lack of adequate return in terms of price. Below is a list of the most common investments:

- Spending money to take more ice
- Crew training on proper icing/handling
- Paying more to retain experienced crew
- Bleeding fish
- Re-insulating/upgrading the insulation of fish holds
- Investing in ice machines on board or shoreside
- Negotiating and building relationships with buyers

While some of the above may be difficult to invest in without a guaranteed return, the last bullet is one to consider because it is free and available to anyone. It does require an investment of time, but it can potentially result in valuable returns. Fishermen who have proactively put in the effort to communicate with processors buying their product have a better understanding of which practices are most important or have positive/negative impacts on quality and price. Two-way communication and maintaining a relationship over time also provides the chance to build more of a partnership and to explore how to increase market opportunities and value that benefit both processor and fisherman. This is not something that happens overnight, but if some trust can be built and communication can allow for better understanding of the challenges and opportunities facing each party, there is more potential for success in building more value over time.

Larger Potential Investments in Quality: The fishermen interviewed had many ideas about what they could do to further improve or maintain high quality product, but they have not made these investments because they do not trust that they will receive an adequate return. These ideas do require more significant financial investments and as a result, present more risk.

- Purchasing slurry or ice machines (for the vessel or shoreside)
- Purchasing cutting machines (for the vessel)
- Investing in refrigerated/insulated holds
- Refrigerated Sea Water (RSW) systems
- More insulated vats or replacing old vats
- Reconfiguring on-deck set-up
- Conveyors, lifts, hydraulics
- Larger vessels
- Crew training on handling
- Safety training

Regarding training, the idea was raised to incorporate quality handling training into young or new fishermen programs. Safety training connected to quality because captains thought that good training and potentially altering the set-up on deck would reduce safety concerns on deck and allow for more time and focus on handling practices. Because so many fishermen currently struggle to find or retain crew, it has been difficult to invest in their crew's training for the long-term. In addition to safety trainings, fish quality handling training might be extremely beneficial.

> *"Fishing and training courses on safety will allow you to focus more on the fishing than the what if." – New England fisherman*

While many of these investments are currently cost prohibitive to fishermen, the willingness and interest is there if a case could be made for the return on investment or funding made available to help ease the financial burden of these investments.

Price and Pride in Motivating Quality

The goal in focusing on quality with this project is not only to produce a delicious fish fillet or product, but to increase the market opportunities and the value received by fishermen and processors. It is no surprise that price is a primary motivation for fishermen in improving or maintaining good quality fish. Overwhelmingly, fishermen also shared that their own reputations were another key motivator in handling their fish with care.

> *"A bad reputation [for quality] can follow you around for a long time." – New England fisherman*

On the flip side, it is also demoralizing to fishermen with good quality practices to see other boats with worse quality receive the same price that they do, and this decreases motivation to invest in good quality handling practices or improvements.

> *"Price is king for motivation, but we don't live in a reality where quality gives us better price." – New England fisherman*
>
> *"There is a guy next me, and he has his fish baking in [the sun] in a skiff, and he gets the same price as me." – New England fisherman*

The 21 fishermen interviewed were each asked: "how often do you think you're receiving a fair price for your catch?" Responses were divided:

- 25%: most of the time
- 50%: it's a mix
- 25%: never

There was a focus among many responses on the uncertainty of what the price might be on any given day or week. They acknowledge that there are good days and bad days, good seasons and bad seasons. They understand the impacts of the larger market on the prices. But at the end of the day, they are mostly price takers and feel they have little to no control over what they are paid, which does not help motivate additional effort into quality handling.

When fishermen were asked what would help them justify improvements in terms of quality, the responses were focused on price, but with a variety of options:

- Prices that help them recoup investments in quality (whether those are financial investments, extra time, crew, etc)
- Interest in price floors
- Guaranteed purchases or commitment to buy (particularly commitment to buy the whole trip)
- Improved reputation (leading to potential access to sell to buyers with higher value markets, or more respect and willingness from buyers to negotiate and create a longer term relationship with more give and take)
- Mixed interest in contracts or fixed prices in advance

While it is not easy to build new markets or increase value broadly for fisheries in the region, there are opportunities here for fishermen and processors to come together around this shared goal of improved value. Even if the daily prices do not reflect an immediate change, some of these strategies could be implemented today or at least tested. Creating better and ongoing back and forth conversation between fishermen and processors is a step in the direction of finding solutions that would benefit everyone.

> *Opportunities for Mutual Benefit:*
>
> *[One fisherman shared about a buyer that would let him know in advance what volume they were looking for] "That was good to know. Okay, maybe we can get it all in one day. Or another buyer I had, I'd call: 'do you need cod this week?' 'Yes, we do' – it's nice knowing what buyers want ahead of time." – New England fisherman*
>
> *"Haven't had any price contracts, etc, but yes, that would help. Also hard to sell the rest of the catch to another buyer if the best is taken off the top…. In the future, I hope there will be certain boat names and people will actually ask for my fish." – New England fisherman*
>
> *"We're not both trying to make the same buck, we are trying to make a buck each. We have a mutual respect and constant communication. Having an idea what you're going to see for prices lets me determine my break-even point and decide when to go. And then the dealer can adjust their price if they really need fish." – from a New England fisherman with a good buyer relationship*

Multiple Ways that Quality Impacts Price

Clearly, there are many factors that have an impact on price, and processors that were interviewed spoke to how quality is connected to several key factors. Overall, processors shared that they can always do more with a higher quality fish. Market conditions, including supply and demand, inflation, and competition with imports all play an important role. However, in a market with tight margins, higher quality fish provide better yield and longer shelf life, both of which give processors more options for finding the most valuable home for that fish in the marketplace. Below are key factors in pricing where quality has an impact:

Yield: Processors are closely tracking the yield they get from the fish moving through their facilities on a daily basis. How well they did with yield one day can have an impact on the price for the next day as they try to anticipate quality levels and potentially make up for losses. A processor has a certain amount of fixed costs per pound once they purchase whole fish in terms of labor, unloading, icing, weighing, trucking, etc. Some processors shared examples of the difference between receiving two individual fish that weighed the same and were purchased for the same price per pound on a given day. Once a processor cuts the fish, if the processor's yield is 100% of the usable portion of the fish from one fish versus 80% of the usable part of the fish from the other, it results in a 25% higher per pound cost on the second fish because of the fixed costs being applied to a lower yield. This might be the difference between properly icing fish or ensuring it's not getting bruised on the boat. Processors do sometimes avoid purchasing from boats that consistently or regularly have lower quality / lower yield product, which hurts the vessel's opportunities in the market.

Visit gmri.org/quality for a two-page handout on yield's impact on pricing, including detailed examples with different species.

Shelf life: A critical benefit of higher quality fish is its longer shelf life. Especially when moving fresh product, the shelf life clock starts ticking before fish even come out of the water, given the impacts of gear on fish that experience damage during a longer soak in a gillnet or during a long tow or while being hauled. Then once fish is on deck, the clock really starts to tick. Shelf life can have an impact on prices because processors are forced to move lower quality fish faster in order to avoid total losses on that product. If the market is not great and the processor does not have a lot of options, they may need to sell that fish quickly and take a low price for it. But if they have a fish that is higher quality with extended shelf life, that might give them several days in which to wait for or explore better options and prices for selling that fish. Further up the supply chain, shelf life is also valuable to chefs and the buyers ultimately selling the product to consumers. They run into the same challenge of having to move lower quality product quickly and potentially taking a loss on it, which does not lend itself to making that chef or market owner want to purchase the product again. But if a chef has a product with better shelf life and has at least a few days in which to move product on the menu, that gives them more assurance and confidence to keep purchasing that product and to potentially pay a higher price for it.

Visit gmri.org/quality for summaries and detailed reports of shelf life experiments with black sea bass and pollock.

Consistency: Key to processors being able to reward boats that do provide good quality is consistency in the quality. If processors regularly receive inconsistent quality fish, they have to account for the unpredictable losses in terms of yield when they are making decisions on price each day. They place great value on consistency in quality – and expressed that it is more valuable to receive consistently decent fish than fish that is high quality one day and mediocre quality the next. The predictability is what they need to build market opportunities and value.

Availability: Consistency in availability is also important. Processors want to be able to ship fish to their customers every day and every week, and creating better markets or opportunities requires consistency in availability. One processor put it best:

> *"We do, at times, pay certain fishermen more, but usually the driving force is their consistency of their catch. If you're going to give me fish once in a blue moon, and it's unpredictable, that's way less valuable than somebody who's going to give me fish all the time [with consistent and decent quality]. I can sell it for more because it's predictable. I can market it, I can plan around it. I can be efficient with facilities, labor, etc - these other things besides quality that factor into our decision making." – New England processor*

We realize that for some species, like groundfish, providing consistent landings is often impacted by regulatory challenges associated with fluctuating quotas and choke species. This is one of the fundamental challenges in building market opportunities for groundfish. However, with smaller volumes landed, it becomes even more important to try to capture the greatest dollar per pound, and focusing on small volume, high quality fish is an opportunity.

> *"For my business the benefits of better quality have been a reputation for good fish and access to a higher tier of buyers. Good catch handling and a long history of production have helped us gain the respect of some key buyers who deal candidly with us. The benefits are long-term relationships where each party helps the other over rough spots and overlooks the little things that might derail a weaker relationship." – New England fisherman*

Challenges for Seafood Buyers (Retail/Restaurant/Foodservice)

During the strategy sessions held with supply chain participants, we heard from **restaurants, retailers, and institutions** about the following challenges to sourcing more local seafood.

Quality:

- General concern with quality issues, inconsistencies in quality
- Needing personal connections with fishermen to access premium quality, line-caught fish (not knowing how to connect with fishermen or how else to access this quality of fish)
- Interest in information about day boat vs trip boat for quality purposes
- Quality of frozen – interest in frozen for inventory management and availability/convenience, but matters *how* it's frozen and that you start with high quality fish; also dealing with stigma around frozen as second best; plus some species are better fresh than frozen
- Quality issues that should be flagged or addressed by processors: seasonality impacts on quality (e.g. spawning times); worms / parasites in fish
- Shelf life: some want longer shelf life; some felt long shelf life is less critical because they're moving fish quickly and more concerned with receiving good quality fish

Supply availability and demand:

- Different volume needs do not always line up with supply availability; challenge of not knowing what will be available when
- Suppliers are not always proactively offering local items
- Distribution challenges in accessing local product
- Volume and distribution can dictate format (fresh, frozen, etc)
- Smaller businesses challenged to buy from auctions
- Menu planning for some businesses happens way in advance, does not give flexibility if locked into single species
- Matching volume needs of buyers with supply - both sides of the coin; some restaurants low volume, some schools much higher volume

Restaurant/retail/institutional education needs:

- Chefs get in their habits and do what's easy
- Learning how to process whole fish and how to use different parts of the fish
- Lack of space to break down whole fish in house
- Turnover of staff makes training and building buy-in challenging/ongoing need
- Culinary schools not teaching how to deal with whole fish or less familiar species
- Not easy to get information from suppliers about which boat/captain (for storytelling)
- Stigma from some chefs around certain less familiar species (e.g. skate, dogfish)
- Lack of awareness around seasonality for different species

Consumer education needs/challenges:

- Challenge of consumer demand focusing on popular species (i.e. haddock, salmon, tuna, shrimp)
- Need more education of consumers on different species and seafood seasonality
- Cost as a barrier to purchase
- Stigma of frozen being bad
- If you're too generic with menu ("fish sandwich") to allow for flexible sourcing of different species, some customers become skeptical, feel they're getting ripped off
- Varying clienteles, customer bases for different businesses
- Generational differences
- Consumers aren't educated on how to eat whole fish

Assessing Quality

Defining good or high quality fish is often subjective and it can be unclear how definitions might differ (one person's average quality fish is another person's poor quality fish, etc). Part of this project was focused on efforts to more objectively define quality and to find better, more precise ways to measure it.

Fishermen described high quality fish with the characteristics below.

Physical/Visual Category	Characteristics of High Quality Fish
Eyes	Clear, no gray, no clouding (unless cloudy due to being close to freezing), no redness
Flesh	Firm, cold, like inflated basketball
Skin Condition	Not rashed up or bruised, no scuffing, no denting or scars, not beat up, with scales intact, good shine, not wrinkled, with slimy sheen, wet
Skin Color	Iridescent, bright, no discoloration, same color as when they are in the water, not pale
Gills	Red (exception: if fish has been bled properly, gills may appear pale)
Smell	Not smelly; smelling fresh

Table 2. Physical characteristics of high quality fish.

> *"The color of the fish coming out of the water should be the same when landed on the wharf. With brining it holds its color – preserving that color is huge. Firmness also is important." – New England fisherman*

Processors are looking for similar characteristics, and use several methods for assessing fish quality before purchasing, including:

- Professional graders at auctions: These graders are typically employed by multiple processors, and there are only a very small handful of people who hold this kind of role in all of New England. Processors that are local to a particular auction will sometimes send their own staff to the auction to grade and check on quality. All of this grading is a visual and physical inspection – visually checking eyes, skin, gills; physically checking smell or firmness, etc. Graders we spoke to have mostly been doing their work a long time, and "just know" what different grades look like. They do assess for many of the characteristics in the table above, but not against any particular standardized metric. There is no universal standard for finfish quality in New England. Two different graders might each have different versions of what they consider an "A" fish or a "B" fish. Processors reported that they get to know their graders and develop an understanding of what, for example, a "B" fish means when graded by different people.
- Vessel/captain reputation: The reputation of a boat plays a big role in the quick decisions that processors are making on a day-to-day basis, and those reputations may have been built over many years. On the auctions, not all processors rely on graders, or if they do, they use their information in combination with past knowledge and experience with different boats. One person pointed out that this does lead to situations where they are making decisions from afar based on which boat they think might have a particular level of quality, but that's not always true of the fish available that day. For processors purchasing fish more directly from boats, they may prioritize purchasing from (or avoiding) particular boats based on past history with quality, among other factors like reliability and consistency. A boat's reputation can play a big role, and can also be hard to change. One processor mentioned that they would still choose a boat that had historically given them consistently good quality fish, even if the grading for the day was off.
- Inspection upon arrival at processing facility: Most processors are doing some sort of grading when fish arrives at their facility. This is often a brief visual check to make sure the fish is the expected quality. Some processors said they do not hesitate to reject fish if it's in poor condition when they receive it. When fish arrives, they are making fast decisions about what they will be able to do with fish of varying levels of quality, and what customers should receive which fish. According to one processor, "Volume is nice, but quality is king." If quality is not there, a couple of processors said they prefer not to purchase any fish than to risk their own reputations with their customers with poor quality product.
- Rare use of thermometer: Most processors are using visual/physical methods to assess quality. Using more objective tools, even as simple as a thermometer to check how well the cold chain has been maintained, is rare.

Challenges for New England finfish with grading and assessing quality

The fast pace of the seafood industry's day-to-day operations and the current state of quality assessment in New England combine to create some challenges. Below are the challenges that emerged from interviews with fishermen, offloaders, and processors.

- No universal standard: Different businesses and different graders can have varying opinions on what counts as high, average, or low quality fish. When asked if a universal standard would be valuable, processors expressed mixed feelings. They can see the value in everyone having the same definition of quality, but anticipate that it would be difficult to implement and change current habits. There was concern that transparency with customers (like restaurants, retailers) around grades of fish could backfire. As processors shared, all of their customers want to believe they're getting the best quality fish, and no one wants to buy a lower grade product. However, there could be ways around this; for example, instead of letter grades (A, B, C, etc), there could be names for different grades that do not damage the product's reputation, much like with beef (e.g. prime, choice, select). True Fin, while they were in operation in Portland, ME, took the latter type of approach to distinguish different quality levels without deterring customers – and in fact, found that customers appreciated the labels and transparency. Having a universal standard could help build New England's reputation and help prove that our region can produce finfish that is just as high quality as product from regions with strong reputations like Alaska or Iceland.
- "There's a place for every grade of fish": Several processors shared that there's a place for every grade of fish, and they can find a home for poor quality fish if necessary, but higher quality fish always gives them more and better options. Implementing more consistent best practices across the region, both on vessels and shoreside with offloaders and processors, would provide more opportunities to build the region's reputation around quality.
- Realities of supply and demand: Processors also spoke to the complicating supply and demand factors that can contribute to poorer quality product sometimes selling for higher prices than would be expected. If a processor really needs product to fill orders, they may pay more than they otherwise would for lower quality product. Unfortunately, this contributes to the challenges that retailers and restaurants sometimes express about inconsistency in the quality of fish from New England – lower quality fish showing up in the market damages the reputation for the whole region over time. And of course, it is demoralizing to fishermen that are taking better care of their fish to see lower quality product fetch a decent price.
- Challenges associated with *when* fish is graded: For fishermen, a large challenge is the loss of control once they offload their fish. Some auction houses in the region are not receiving enough volume to have auctions every day, and so fish can end up sitting in cold storage for up to several days in some cases. If the fish is not properly iced or kept chilled over that period of time, quality can deteriorate and impact the price the boat receives – as well as their reputation if it happens repeatedly over time. For fishermen offloading in ports that are further from processing hubs like Portland, Boston, or New Bedford, they may be turning fish over to trucks owned by processors or trucking fish themselves. In peak hot summer months, if the trucks are

not kept at a low enough temperature, that can have an impact on how the fish shows up to the processing facility and how it's graded for quality.

- **Inconsistent or lack of communication:** The level of communication between processors and fishermen about quality varied widely among those interviewed. Some processors proactively remind boats to use more ice, for example, as water temperatures rise in the spring. Some fishermen proactively talk to the processors they sell to and ask for feedback on quality, and to understand other factors impacting their price. On the flip side, processors and fishermen both shared that often they are only in communication if something has gone wrong. It's in reaction to something negative, with one or the other upset about product quality issues or price, etc. Additionally, fishermen and processors that buy/sell via auctions are rarely in direct communication but instead might communicate through a seller representative. Only communicating when things go wrong is not great for relationship building. There is an opportunity here for fishermen and processors (including seller representatives) to shift to more proactive communication on both sides and to open up conversation about potential opportunities for both.

> *"A universal standard would have value on both our side and fishermen, so they know what they're pulling in, but there are obstacles to implement… it would be great to get to that point."*
> *– New England seafood processor*
>
> *"It is harder to get a sense of what is impacting your fish price when you sell through the auction, unless you are hearing it daily from the seller rep. You don't know who bought your fish, if it was one of the first lots bid on, etc. Prices are much more fixed by supply and demand and if you get the low or average or high price of the day, you don't know if it is because of quality or just how the auction went (for example, first lots chosen are often best quality but because of bidding process, doesn't mean they always get best price)." – New England fisherman*

Measuring Quality Objectively

The project team partnered with nine fishermen and three processors/offloaders across New England to conduct experiments measuring quality with different tools and comparing quality handling practices. The goal was to understand opportunities to bring more objectivity to the industry's understanding of quality, with the hope of creating better options in the future: rewarding fishermen for high quality based on concrete metrics; sharing data with customers about the quality of product; developing standards for quality to be used more universally across the region; clearer communication between vessels and processors/offloaders about quality expectations and connection to price.

For these experiments, nine fishermen took four trips each and tested different quality handling methods with a range of species. Temperature loggers were used by fishermen and put in totes with fish to track how well the cold chain was maintained. In most cases, those loggers stayed with the fish through offload and trucking to see how the cold chain was maintained shoreside. Project staff, as well as processors/offloaders, participated in measuring fish shoreside after offload with two different quality

assessment methods: the Quality Index Method (QIM) and the Certified Quality Reader (CQR). There were also shelf life experiments conducted to better understand the expected rate of degradation and the benefits of different quality handling practices.

Both short summaries and detailed reports of experiment results for different species are available at gmri.org/quality.

Opportunities for Fishermen

There are a variety of opportunities for fishermen to improve or better maintain the quality of their fish, which were identified through a combination of researching best practices from around the world, feedback from the fishermen and processors involved in the project, and the experiments undertaken as part of the project. Below are the most fundamental and high impact opportunities that can maintain very high quality without significant investment of dollars. Many of these represent investments of more time and effort on deck, and some are direct costs.

Keeping fish cold: Chilling fish as quickly as possible to below 40 degrees F is the most critical action for maintaining good fish quality. Below are more specific considerations for chilling fish:

- **Slurry ice:** The processors we interviewed, as well as fishing industry members (harvesters) from other parts of the world (e.g. Alaska, Iceland) believe that slurry or slush ice is the best chilling method for maintaining quality. Slurry is preferred because it cools fish faster than using only ice, since the fish are fully submerged in the slurry and because seawater has a lower freezing point than freshwater. From a quality perspective, it is also lower impact with much less risk of bruising or crushing. If using a slurry, it is important to make slurry correctly because if the fish sits in fresh water, it has a negative impact.

For video of making slurry ice, visit gmri.org/quality.

- **Layering ice:** If using only ice, layering ice into the catch (instead of only at the bottom and top of a vat, for example) makes a difference, especially in warmer weather when the middle of the pile may struggle to cool down. Obviously this requires an increased cost in more ice and more space on board.
- **Using enough ice in spring/fall shoulder seasons:** Processors noted that they see a dip in quality in these shoulder seasons, when the assumption might be that the water or air temperatures are cold enough (e.g. 50 degrees F) and that less ice is required. However, unless fish is being chilled to under 40 degrees, more ice is required, even in these cooler seasons. There was evidence of this issue in the experiments mentioned earlier.
- **Types of ice:** There are varying types of ice, and cubed ice is the least preferable because of how it can bruise and damage fish. Flake ice is preferred and used by processors in their own facilities because it is least likely to damage fish and cools fish faster than blockier ice (like cubed) because it can more fully cover and make contact with the fish. The tradeoff to flake ice is that it also melts faster and it can require taking more ice to ensure you have enough. Crushed

or cracked ice is what is most available in ports across New England, and it falls in the middle between cubed and flake ice. If using cracked/crushed ice, most important is making sure you have enough ice to cool to below 40 degrees F and to consider how you pack and store fish in the ice to minimize crushing or bruising.

> *Fishermen on Chilling:*
>
> *"I hose down all my equipment, wherever the fish will touch – all those things heat up in the summer, cool 'em down."*
>
> *"The nice thing about storing in a slush/slurry in a xactic is that I don't have to take extra time to place fish correctly. If we were to store fish in the hold, I would do belly down and head to tail."*
>
> *"If you take a tote of sea bass and put in a shovelful of ice the ones in the center never cool down. If we do use totes, we have levels of ice and move it all through."*

Shorter soak or tow times:

- First, it *is* possible to achieve extremely high quality fish across a range of gear types, including trawl nets, despite their reputation for less control over quality. While hook gear and traps/pots tend to produce the highest quality fish, there is potential for great quality regardless of gear.
- Perhaps unsurprisingly, what multiple processors shared is that there is a notable difference in quality for fish that was caught and sold from a dayboat versus fish caught on multi-day trips. However, there is still opportunity to minimize soak or tow times as much as possible to avoid fish getting damaged while still in the water, as well as opportunities to handle and store fish with care to maintain quality as best as possible on a longer trip.
- Processors shared that they can tell whether fish was soaked for too long in a gillnet, and will pay more for dayboat gillnet fish. Some processors monitor how long vessels are out to try to predict the level of quality in advance of considering whether to purchase and for how much.
- One processor noted that it would be of potential value to be able to market and promote shorter trips to customers.
- Two processors proposed exploring the potential for longlining fish in New England and increasing the percentage of hook-caught fish overall, given the high quality that can be achieved with those methods. Making this transition would require significant effort and expense, and longlining fish requires more ongoing crew and expense in terms of bait and effort to bait hooks.

> *"If you're cod fishing or dog fishing, you're hauling your gear every day, and you know that the fish has been in that temperature water for less than [the soak period]… But when you've left the net out for like 72 hours or longer, you don't really know when it died. You really have to look at each fish as, would I eat this? Or would I feed this to my family?" – New England fisherman*

Minimize how many times a fish is handled:

Handling with care is very important for quality purposes, and part of that is touching the fish as few times as possible.

- **Think fresh fruit:** Avoid stepping on, throwing, and gaffing fish. In speaking to fishing industry members from Alaska, they made the comparison to fresh fruit – you wouldn't want someone tossing around or stepping on fresh fruit, and you also don't want to do that with fish.
- **Handling is connected to yield and value:** Fish can bruise and be damaged easily, which impacts both quality and yield. When yield goes down, that fish costs more for a processor and makes less money. Some species bruise more easily than others (e.g. hake, monkfish) and processors can tell they've been handled poorly when they cut into the fish. Not being able to count on getting the full yield out of what they are buying can have long term impacts on what processors are willing to pay.

Keep it clean:

Dirty surfaces and surfaces that are not cleaned regularly are breeding grounds for bacteria, which may impact quality in ways that are not detectable to the naked eye, but will speed up how quickly that fish is degrading. This can reduce shelf life, which means a processor will have to move the fish faster and reduces their options for finding a better market opportunity (value) for that fish. This includes vats, totes, knives, surfaces where fish are cut, etc.

- **Clean surfaces and knives:** Especially when cutting fish in any way, ensure knives and surfaces are clean so that you are not exposing the most valuable parts of the fish to bacteria that will reduce its quality faster. Clean and sanitize after every trip ideally.
- **Rinse as you go:** Bleeding and gutting fish, if the market demands it, can improve or maintain better quality product, but not if the fish starts rotting faster because it was cut with a dirty knife. Rinse as you cut, and periodically wash away slime/blood to keep it clean.
- **Replace wood:** Another opportunity to improve the ease of keeping things clean on a vessel is to replace any wooden pens or other equipment made of wood with materials like aluminum, steel, fiberglass, or other easier to clean materials. Wood is difficult to ever get completely clean and holds bacteria over time.

> *"Just put the brakes on the decomposition as quickly as you can. A lot of rinsing, a lot of washing. A lot of guys cut a 1500-lb checker of fish without even running the water over… you can wash off the slime, wash off the blood, keep the product clean. That's the stuff that is draining out of the inside of their bellies - stomach acid breaks things down. Keep your fish clean and keep rinsing it as you cut." – New England fisherman*

Careful packing and storing fish:

Packing and storing fish carefully to avoid crushing and bruising is also important to avoid decreasing quality.

- **Smaller totes/vats:** If feasible, investing in smaller totes or vats to minimize the weight of fish in the hold or on deck is one strategy to consider. This can minimize the differences in quality between the top of the catch and the bottom of the catch.
- **Insulated holds:** Many fish holds in New England are uninsulated, but retrofitting a hold with insulation is also worth considering to maintain a cold temperature (under 40 F degrees).

> *"In a boat with a well insulated hold, only put a two-inch bed of ice down. In a boat with a less insulated hold, put down a bed of ice that is two boards high and have thicker layers of ice in between. Fish are always packed parallel and belly down." – New England fisherman*

Bleeding, gutting, and cutting fish:

Bleeding and gutting fish *can* have great benefits for quality purposes and can have an impact on yield and shelf life (which impact pricing), but it really depends on the situation.

- **Bleeding fish caught live:** Bleeding is most effective at maintaining high quality if the fish is landed alive and quickly killed on deck (whether through an ike jime method like the brain spike or otherwise). It may also depend on the market opportunities that any given processor has for higher quality product.
- **Slurry considerations:** Gutting is not preferred if the fish will be sitting in a slurry because you want to avoid water getting into the cavity, and the same is true for heading a fish. Gutted fish should only stay in a slurry for 2-4 hours maximum.
- **Consider time from offload to processing plant:** The benefits of gutting also depend on how much time it will take from the moment that fish lands on deck until it reaches the processing facility – the faster that process is, the less necessary it is to gut a fish (like for a daytrip). If fish is going to be sitting on a vessel or shoreside (i.e. waiting for auction) for days before being processed, gutting can help maintain shelf life and prevent internal degradation of the fish as the guts start to rot.
- **Monkfish tails:** The yield on monkfish tails varies depending on how well it is cut. Monkfish also bruises easily and benefits from minimizing the number of times it is handled. This is an opportunity to talk to the processors buying your catch to learn whether your tails have a good yield.
- **Skate:** Different processors have preferences for whole skate or cut wings. The risk of a skate becoming ammoniated and smelling increases the longer it sits. One processor shared that bleeding a whole skate quickly after catching it can eliminate most of the ammonia smell (or the risk of it). This can be done whether the skate will be kept whole or cut for wings.

- **Talk to processors:** Gutting obviously requires additional time and capacity for the boat. Processors have varying preferences, and their preferences also vary by species – it's important and worthwhile for fishermen to have a conversation with buyers to understand their preferences and what the opportunities might be if they were to gut and/or bleed certain species.

> *"Some guys – they cut the fish, throw them in the pen, and then gut them. We gut 'em and cut 'em at the same time. We are always high on auction in terms of price. They go from a saltwater tank [where they bleed out] into a tote and then are lowered into the hold. Most fishermen have always done where you're handling the fish more, which doesn't make sense. Our way we try to handle as little as possible." – New England fisherman*

For a table outlining low to high cost investments fishermen can make into quality improvements and adjustments, visit gmri.org/quality.

Opportunities for Processors

Opportunities were also identified for processors to better maintain and improve quality, and to leverage their place in the supply chain to achieve greater value for local finfish.

Maintain the cold chain: Processors play an important role in maintaining the cold chain and keeping the temperature of fish below 40 degrees, and ideally in the mid-30s. A particularly challenging area in the supply chain for maintaining the cold chain is when fish is offloaded from a boat onto a truck and then has to be transported to a processing facility elsewhere, which can sometimes take several hours depending on the number of stops, traffic, etc. This is problematic in the warm summer months when refrigerated trucks might not have the temperature as cold as it should be when the offload begins, or if the trucks struggle to maintain the required low temperatures. We also heard from processors that there can be gaps in the cold chain during unloading from trucks at their facilities, if product is in a loading area that is open air or temporarily stored in an area that is not as cold as it should be. Further, in older facilities, it can also be challenging to keep the temperature low enough or to prevent leakage/loss of cold air from processing spaces. One processor invested in upgrading the sealing of different rooms in their facility to maintain necessary temperatures for quality and food safety, and the reduced leakage resulted in higher quality product and less shrink.

Careful handling and sanitation: The same advice applies here as is described above for fishermen. Minimize the number of times fish is handled, and handle and pack fish carefully (think fresh fruit). To avoid bruising and reduced yield, fish should not be thrown around or tossed. Carefully packing and storing fish can minimize crushing and related damage.

Sanitation is also extremely important to avoid exposing fish to bacteria, especially while it's being cut and processed, that will cause faster degradation and reduced quality. In another project, GMRI worked with Dr. Jason Bolton to produce a quick guide to "Best Practices for Processing Quality Finfish," which

can be found on the UMaine Cooperative Extension website. A key recommendation in the guide is for processors to leverage their relationship with their sanitation chemical supplier. Good sanitation suppliers should work with processors to identify and potentially train staff on Standard Operating Procedures for using chemicals and cleaning surfaces and equipment. It is also valuable to talk to sanitation suppliers about potential cost savings to be had by using automatic dosing equipment and purchasing chemicals at higher concentrations (which, when done properly, can actually reduce cost by using smaller amounts). Processors who have strong communication and relationships with their sanitation company have been successful in actually reducing their overall chemical use, while improving their cleanliness and quality. Some processors have used tools like ATP luminometers (handheld tool that detects bacterial residues) to swab surfaces, identify weak points, and regularly test bacteria levels. For at least one processor, this resulted in identifying exactly where staff needed more training and led to staff improving their practices, in part due to the greater accountability that was built in with regular testing.

Better use of whole fish: There are opportunities locally to supply whole fish to different demographics and communities that have traditionally been accustomed to cooking with and eating whole fish. This is a particular opportunity for finfish species that are less well known and that may not have strong market demand. It is also an opportunity for smaller finfish species that are more labor-intensive to process, but do not have a high yield.

In addition to selling fish whole, there is also opportunity to achieve greater value for the local seafood industry by finding higher value outlets for different parts of the fish. This will not happen overnight, but there is opportunity in the cosmetic, pharmaceutical, and fashion industries to convert less valuable parts of the fish to higher value uses than bait or pet food. This might require partnering with start-ups and entrepreneurs, and there are several hubs in the region (Gulf of Maine Research Institute (Ventures programs), New England Ocean Cluster, New Bedford Ocean Cluster) where these relationships can be developed. Importantly, maintaining high quality for the entire fish is critical in order to enter any of these higher value markets for other parts of the fish besides fillets.

Freezing fish: Freezing fish is an opportunity for the region. Historically, the markets for local fish have demanded fresh product, but the global seafood industry is making significant use of the improved freezing technologies now available. Freezing has the potential benefits of:

- Overcoming the challenges of inconsistent availability of fish
- Increasing shelf life and flexibility
- Preserving the quality of the product
- Potential for more consistent pricing
- With more predictability, potential to build more market opportunities

However, frozen fish is not without its challenges, especially if it is not done with planning and some strategy. One processor shared that it's important not to use freezing as a crutch – that it is easy to

assume you'll be able to sell the frozen product later, but it is not always that simple. Some caveats of freezing local fish are:

- Need to start with good quality fish to freeze
- Need sophisticated freezing technology for it to retain the fish quality
- Inventory management can be challenging without a plan

There are shifting attitudes about frozen fish and that it can be good quality, particularly from chefs. There is an increased understanding that fresh is not always best, and opportunities for more exploration of freezing fish – not just occasionally when there's a glut of product, but intentionally to create different opportunities in the market.

Building new markets: We have seen examples of higher quality fish capturing more value in the marketplace, particularly with high end restaurants, but also retail. For example, True Fin was a business that focused on maintaining extremely high quality fish and they successfully built demand and market opportunities for that product. The business did not close due to lack of demand. There is opportunity for other processors to pursue those niches and higher values that True Fin was developing, not just in New England, but in major markets across the U.S. (Chicago, Philadelphia, New York, etc). There is also opportunity for more value-added products using local fish, which are in demand from a variety of market channels given interest in convenience from consumers and staffing challenges that retail, restaurants, and institutions face in terms of turnover, shortages, or lack of time to train. We heard a direct interest from restaurants, retailers, and institutions in IQF local fish, high quality frozen local fish more broadly, and interest in local value-added products.

More communication with buyers: Buyers like restaurants, retailers, and institutional foodservice are eager for local seafood and seeking more information to help them promote and tell stories about that seafood to their consumer customers. These chefs, managers, and business owners reported an interest in more regular communication about seasonal options, less familiar species (how to work with these species; how to sell them to consumers), sustainability of seafood, stories of fishermen or sea farmers, seafood quality, and more. These buyers are constantly working to educate their own staff to help them sell the products to consumers, so there are opportunities for processors to better support in providing information and directly participating in training when possible. These interests do not only come from high end restaurants, but from major retailers to small regional chain restaurants to K-12 school cafeterias. Finding ways to encourage more two-way conversations and stronger relationships with these businesses has huge potential for moving more local seafood into the marketplace. They expressed interest in better understanding the full range of local species that suppliers can access (including species like black sea bass, scup, Jonah crab, flatfish, skate, etc) and clear order guides to reflect that.

Communication with fishermen: Communicating expectations and talking with fishermen about opportunities around quality is not something most processors that were interviewed are doing proactively. There is the potential to partner more with fishermen and develop mutually beneficial opportunities in the marketplace. More regular communication is valuable for both parties to better

understand each other's challenges. A fisherman may not know that they have a quality issue with their fish, but might be willing to and interested in fixing it if given constructive feedback and if they have a relationship with their supplier. Likewise, a processor may not realize what challenges fishermen are dealing with on the water at different times of year – for example, if there's an issue with access to ice, maybe a processor can help invest in fixing that if they have more awareness.

Opportunities for Buyers (Retail/Restaurant/Foodservice)

During strategy sessions with restaurants, retailers, and institutional foodservice, buyers identified opportunities for their own businesses to move towards sourcing more local seafood.

Storytelling and education: The primary opportunity identified across workshops and business types was to do more storytelling and communications with customers (consumers) and with their own staff. A big theme is to focus on education and storytelling to raise awareness of less familiar species. Education around seasonality of seafood was also a big theme and area of interest. (Since the workshops, the project team created a seasonal highlights guide to New England seafood.) Businesses were also very interested in focusing on fishermen's stories and local provenance, as well as sustainability as part of those stories. Buyers saw opportunity in evolving how we talk about seafood sustainability (focus on stewardship, responsible nature of industry), and also focusing on health benefits and positive messaging about seafood. Storytelling and education can happen through social media, by using menus and signage, through special events, and by bringing in partners (seafood suppliers, fishermen, support organizations, etc).

Species diversification: The chefs and buyers identified opportunities to diversify what they put on the menus by being more creative with recipe development, using specials as a way to introduce less familiar species, trying out local catch of the day or the week programs, continuing to educate both customers and staff about a variety of species, and focusing storytelling around seasonality. This effort requires buyers to be more flexible and nimble – simultaneously committing to local seafood on the menu, but being flexible about substituting different species into the same recipes. Buyers might consider flipping between imported and local seafood for the same recipe if there are times of year when no local product is available to fit a certain dish.

There were some discussions about particular species for diversification – like **flounders** (flatfish), which are currently a primary target for northern New England fishermen. Chefs pointed out that smaller flounders work well as whole fish entrees, that sole has a great reputation in the marketplace with chefs, and that flounders can work well fried whole in a casual seafood restaurant setting. Chefs also shared that high end restaurants like fish with thin fillets because they work well in a pan seared preparation, and that stuffed flounder is a good technique to get around thin fillets drying out quickly when baked. There was also discussion and interest in **scup,** which is a target species for southern New England fishermen. Scup can similarly work as a whole fish entrée. Chefs thought there was opportunity to replace certain imported species, like sea bream, with a fish like scup.

Make a public commitment: Making a public commitment to source more local seafood and making a specific goal around that can be a powerful tool for buyers to use. For example, the Gulf of Maine Research Institute has a membership program, Gulf of Maine Tastemakers, for restaurants, retailers, and institutions that want to commit to sourcing at least 35% of their seafood from New England. Setting a goal is a great way to motivate staff to work towards something specific, to stay accountable, and to share a tangible story with consumers about how your business is making progress.

Training: Some of these opportunities to diversify species may require training for restaurant or institutional culinary staff on how to handle, prepare, and store different species. There is also a lot of opportunity, which some organizations across New England are working on, to educate culinary students and partner with culinary schools and vocational programs. Developing a foundation for future chefs to understand how to work with a range of fish species is a long-term investment in building more demand for local seafood.

Frozen local seafood: There is increased interest and acknowledgment of the opportunity to use frozen local seafood from restaurants, retailers, and institutions. These businesses see the opportunity, and also the potential challenges – of needing a high quality frozen product, and also ensuring they have freezer space for short term storage, which can vary significantly business by business.

Institution-specific opportunities: Managers and chefs from institutions like colleges and schools, as well as processors, pointed out key opportunities for this particular market channel. The institutions on an academic calendar often have trouble sourcing local food more broadly in New England since they are not as active in the summer during peak season. While general seafood demand from consumers also peaks in the summer, seafood is available year-round, and institutions can be an important bolster during the less busy times of year for seafood businesses (especially through the winter). Also, for colleges where students have a la carte meal plans, they are often trying to spend down their accounts at the end of the school year. This is an opportunity for both school foodservice operators and seafood suppliers to consider slightly higher cost items and making sure seafood stays on the menu through the end of the school year.

More communication with seafood processors and harvesters: Buyers identified that more collaboration and conversation with seafood suppliers, as well as connections to harvesters, would be critical to taking advantage of the opportunities they see. Buyers have an opportunity to more proactively share their aspirations around sourcing more local seafood with their suppliers, and to ensure that their supplier can actually meet their needs. This includes sharing more explicitly whether they are interested in sourcing a broader diversity of species, more local frozen or value-added items (even if those are not consistently available yet), and what kind of support or information they need to be able to promote local seafood to their own customers. This is also an opportunity for buyers to better understand the challenges that seafood suppliers and fishermen can face, how to collaborate with them on solving these challenges, and to learn more about seafood seasonality or unique opportunities that come up throughout the year. Building relationships with fishermen and sea farmers is important to telling those stories authentically, and seafood suppliers can be a conduit.

Opportunities for Support Organizations (Nonprofits, Trade Associations, Government)

During strategy sessions, participants also identified important roles for support organizations to play. This includes:

- Storytelling and public education support:
    - Creating buzz
    - Create educational materials around different species
    - Increase public awareness about lesser known species
    - Public campaigns/promotions about local seafood
    - Positive messaging
- Education and networking for the seafood supply chain:
    - Create opportunities like these workshops for chefs/buyers to connect with fishermen, suppliers, and each other outside of their everyday
    - Provide samples to chefs/buyers to test lesser known species / develop recipes
    - Information about seasonality, species specific info, marketing opportunities
    - Seek information from the restaurant/retail/institution community about their needs and challenges with local seafood
- Technical assistance on quality improvements:
    - Develop / support infrastructure that helps maintain and improve fish quality
    - Putting quality standards in place
- Funding support:
    - Raising funds and advocating for more government funding and policies that create incentives and make it more feasible for public institutions to buy local products

In conclusion: Areas of agreement and opportunities to work together

Among the many conversations with fishermen, processors, and buyers, there are key areas of agreement.

- Interest in best practices: There is an interest from all sides in understanding and learning about what the best practices are (whether for chilling, gutting, etc), and whether their own assumptions and practices are right. There is some level of openness to trying new things from fishermen and processors, while managing the risks that can come along with that. Everyone is open to hearing about new practices, equipment, or methods, especially if those practices can save time and/or improve value.
- The whole catch needs a home: Both fishermen and processors acknowledge that they need to find a home for every part of the catch, including the lower quality product.
- Interest in building markets for local seafood: This may seem obvious, but everyone would like to build better, more valuable markets for regional seafood. While it often feels like fishermen

and processors are on opposing teams, there is a common goal for many of the people working in this industry. Even for those processors whose businesses have come to rely on a certain volume of imported or non-local product, the individuals working there are often people who grew up in New England's seafood industry, had family involved in previous generations when it was less reliant on imports, have commercial fishermen in their families, and would love to see the local industry thrive. Buyers are also deeply interested in buying more regional seafood if some of their challenges can be addressed.

- **The competition is tough:** Everyone understands that it is tough for New England finfish to compete in the massive global marketplace, and that we compete with fish coming from much larger fisheries with greater economies of scale and more consistent quality and availability.

What can our region's industry do with these areas of agreement? There is an opportunity to move to the next step – acknowledging that we have tough competition and a need to build markets, and then working together to achieve benefits for the whole region. Rather than assuming that there will always be some amount of variable and lower quality product (and low prices), there is an opportunity to consider how the overall quality of the catch can be leveled up. A culture shift towards prioritization of high quality fish and building markets to get the highest value per pound is one potential pathway, but this requires collective effort and trust that is not necessarily there right now.

To move in that direction, there are some key opportunities to work together. Processors could support fishermen to prioritize the practices and opportunities that are low-hanging fruit, like investing in better chilling and icing practices across the region (both on vessels and shoreside at offloading facilities, on trucks, etc). In order to accomplish any of these goals, more communication and feedback between processors and fishermen is critical. Regular conversations to check in and understand what is going well, what can be improved, and where they can work together, would be hugely beneficial. That communication also needs to continue to the retail, restaurant, and institutional customers interested in buying more regional seafood. Most importantly, these communications can help to build relationships and trust, which are some of the most challenging barriers faced by the seafood industry in New England today.

The finfish industry across New England today is not the same industry it was a generation or two ago, and it likely won't look like that again in the near future. But we have healthy fish populations to harvest, a small but savvy and experienced fleet of captains still fishing across the region, and the opportunity to think differently about what this industry could be in New England in the next decade or two. Creating value has to include a focus on improved quality and there are opportunities to partner across the region to achieve that goal and cultivate a thriving, resilient regional seafood system.

Visit gmri.org/quality for a range of resources and more information about this project.