

RHODE ISLAND COMMERCIAL FISHERIES

BLUEPRINT FOR RESILIENCE

APRIL 2018 / RESILIENT FISHERIES RI PROJECT





AN INDUSTRY AT A CROSSROADS

Rhode Island's fishing industry is at a crossroads. Changing environmental dynamics, the aging of the fleet and its fishermen, and shifts in societal attitudes towards work and wildlife cast shadows over this heritage industry and magnify uncertainty for the businesses that comprise it.

While the industry remains a solid employer and component of Rhode Island's economy, being a fisherman is dramatically more stressful than it used to be. Many of today's high-liners entered fishing during the boom times of the 1980s, an era characterized by abundance and affluence both inshore and offshore. The expansion of federal jurisdiction over fisheries to 200 miles from shore in 1976 gave U.S. fishermen exclusive access to many new fishing grounds, and the government and financial institutions poured in millions of dollars to help fishermen make the most of it. Inshore, the opening of many previously polluted areas of Narragansett Bay unleashed a shellfish bonanza.

But those halcyon days soon gave way to a picture of increasing complexity and strain. Management and regulations are now an unrelenting part of fishermen's reality. With a steady-state seafood throughput, the industry now needs to spend more time thinking about value instead of volume. Quarrels over fish can be found in the popular press, painting a picture of an industry bent on its own self-destruction. Use of the seascape by industries other than fishing is rapidly expanding. With most fisheries now governed by limited access regimes that restrict participation in

specific fisheries to a closed group of license-bearing fishermen (and more on their way to adopting this structure), it's not clear how younger people with the creativity and energy to overcome these challenges will be able to enter fisheries – or whether they even want to.

Many of today's established fishermen are nearing retirement. Hard work and independent spirit built an industry that its members were proud of. The circumstances of today, however, call upon fishermen to develop very different skill sets than the ones that got them where they presently are. Increasingly, they must work collaboratively on solving the challenges of today, while also thinking about the issues of tomorrow, such as: What kind of industry will we leave to future generations?

The next few years will be critical to designing a flourishing future for Rhode Island fisheries. The work will not be easy or straightforward. Luckily, new public processes outside of the traditional fisheries sphere, such as Rhode Island's development of a statewide Food Strategy, offer new opportunities to promote understanding of Rhode Island fisheries as a system and to imagine what the future of fisheries could look like. The *Rhode Island Commercial Fisheries Blueprint for Resilience* is an important step in finding common ground among Rhode Island's commercial fisheries participants and supporting innovative, collaborative problem-solving by and for Rhode Island's fishing industry.

THE BLUEPRINT: ORIGINS, PROCESS, AND PURPOSE

Unlike most sector strategy plans, the *Blueprint for Resilience* is not a premeditated outcome of a deliberate planning process. Instead, it came into existence through a process that was formulated with a narrower goal in mind: to design a set of environmental change adaptation strategies for Rhode Island's fishing industry. The project began by bringing fishing industry participants together for a dialogue about changing environmental conditions. It gradually gave way to a broad strategic planning exercise as participants raised many non-environmental concerns and brought into being a comprehensive assessment of the industry's resilience. Though circuitous, the planning process that resulted in the *Blueprint for Resilience* is in many ways emblematic of the kind of adaptive approach to problem solving that is so urgently needed in fisheries governance generally.

Rhode Island's fishing industry has not had a strategic plan until now. Luckily, models from other industries were available as inspiration during the creation of *Blueprint for Resilience*. The Rhode Island Agricultural Partnership's 2011 report *A Vision for Rhode Island Agriculture: Five-Year Strategic Plan*¹ and the Governor's 2017 *Relish Rhody Rhode Island Food Strategy*² provided valuable templates. These touchstone documents also provide a statewide food-themed superstructure that the fisheries-focused *Blueprint for Resilience* can plug into.

The *Blueprint for Resilience* is only a first step in assembling the connections, the knowledge, and the sense of hopeful possibility needed to design a Rhode Island fishing industry for the future. Moreover, as an industry-based plan, the *Blueprint for Resilience* reflects only the voices of businesses in the fisheries sector. It does not speak for other entities, such as State and Federal government agencies, municipalities, academic institutions, downstream supply chain businesses, media, financial institutions, the philanthropy sector, and the general public – all of which also

hold a piece of the answer to the riddle of resilient fisheries. Rather than supplanting the role of these entities, it paves the way for engaging them more meaningfully in the shared work of assuring a vibrant future for Rhode Island fisheries.

The content of the *Blueprint for Resilience* derives from a multi-part process that took place over three winters, consisting of:

Interviews (January - March 2016). Forty-eight fishery participants, representing eight Rhode Island fishing ports, participated in one-on-one interviews with the project coordinator Sarah Schumann. The focus of these interviews was two-fold: to understand how the environment is changing and how fishery participants are adapting to these changes, and to understand barriers that limit fishery participants' adaptive capacity and resilience. Despite an initial focus on environmental change, at least half of the concerns and recommendations brought forth through the interviews were related to themes other than environmental adaptation per se.

Workshops (December 2016 - February 2017). In total, eighty fishery participants took part in ten two-hour evening workshops. Each workshop included between four and forty-eight members of the Rhode Island commercial fishing industry and one or more external issue experts. Topics included: ecosystem-based fisheries management and warming waters, ocean acidification, ecological changes and water chemistry in Narragansett Bay, changes in the seaweed community, squid in a variable climate, socio-ecological community vulnerability, the expansion of black sea bass, the pros and cons of diversified versus specialized business portfolios, and models for combating the low level of new entry into Rhode Island's fishing industry. Transcripts and videos were recorded and shared with the project listserv of 200+ recipients and uploaded to a password-protected online project portal for industry participants.



Scenarios Process (February 2017). On February 21, 2017, forty-five fishing industry participants took part in a full-day scenarios planning workshop facilitated by the Hartford, CT-based consulting firm Futures Strategy Group. Participants were split into four breakout groups and given four future scenarios, each characterized by a different combination of environmental and socio-political realities. The focus of the workshop was not on present challenges but rather on future possibilities. Participants brainstormed strategies to achieve a thriving fishing industry in years 2025-2030 under the four distinct scenarios. Strategies that held promise in multiple scenarios emerged as the most winning strategies for an uncertain future. The goals and strategies developed through this scenarios planning process form the backbone of the *Blueprint for Resilience* (pages 21-35).

Co-writing and review process (December 2017 – March 2018). A draft of the *Blueprint for Resilience* was crafted by the Project Oversight Team in December 2017 and released to members of the fishing industry in January 2018. It un-

derwent an extensive input and feedback process that involved use of the project listserv, mailings to members of fisheries associations, posterage on dock pilings and other shore-side locations, and interception of fishermen at the docks and in meeting rooms. Open feedback sessions were held in Westerly, Wakefield, Point Judith, Wickford, Warwick, Bristol, Newport, and Sakonnet Point.

In all, 125 individual fishery participants contributed to the formation of the *Blueprint for Resilience* through participation in the interviews, workshops, scenarios planning, and/or draft review process. Descriptions and outputs of each of these phases can be found at www.ResilientFisheriesRI.org

Note on terminology: The term “fisherman” is applied equally to men and to women who work on the water harvesting seafood. The term “fishery participants” is used throughout the *Blueprint* to denote all members of the fishing, seafood, and support industries, both on shore and on deck.

VISION FOR THE FUTURE

The drafters of the *Blueprint for Resilience* envision and aspire to a Rhode Island fishing industry in which:

- The public understands and values the contribution of wild harvest fisheries to Rhode Island's economy, culture, and food system.
- State and local governments are champions of the fishing and seafood industry and nurture the social and economic inputs necessary for fisheries to thrive.
- The fishing industry is well coordinated internally and leverages its collective power to advocate for its resilience.
- Relationships between the fishing industry and the fisheries regulatory community are open, constructive, and based on mutual trust and support.
- The science that underpins fisheries management is adaptive and nimble, and is based on significant consultation and collaboration with the fishing industry.
- Fisheries management is ecosystem-based, focused on multiple drivers of change, and adaptive to changing ecological realities.
- Diverse opportunities are available for a diversity of fishermen.
- Fishing businesses of many scales are viable and profitable, unhampered by overly burdensome and costly regulations.
- Individuals who work hard and practice sustained determination are able to thrive in an industry where success is determined chiefly by merit.
- Markets for locally landed seafood are robust, diverse, and innovative.
- Rhode Island consumers seek out Rhode Island-landed seafood in the marketplace, and are flexible in the species they consume.
- Local fishermen are recognized as stewards and sentinels of coastal and marine ecosystems, and they use their positions to advocate for the protection of these environments.



CONTRIBUTION OF RHODE ISLAND'S FISHING INDUSTRY...

...TO RHODE ISLAND'S ECONOMY

Rhode Island's fishing economy includes various types of fishing-related businesses, including net-makers, gear shops, seafood wholesalers, bait stringers, engine mechanics, marinas, boatyards, fuel suppliers, and more. Fishing businesses range from individual intertidal gatherers to 100-foot processing vessels, and include a wide range of vessel types and gear configurations: e.g., quahog skiffs, day-boat and trip-boat draggers, gillnetters, scallop dredge boats, inshore and offshore lobster boats, floating fish trap operations, and rod and reel boats. Rhode Island is home port to 205 Federally permitted vessels and issues 1,600 State commercial fishing licenses per year.³

Jobs in the fishing industry include not only captains and crew, but also owners and employees of many kinds of shore-side support businesses and seafood wholesalers. While no data is available on crew or shore-side business employment, a 2011 report published by Cornell Cooperative Extension Marine Program, *Rhode Island Commercial Fishing and Seafood Industries: Development of an Industry Profile*,⁴ estimated that the fishing and seafood industry supported 7,888 jobs in 2009, including harvesting, processing, imports, wholesale and distribution, and retail.⁵

The economic impact of the fishing industry is sizable. In 2016, Rhode Island vessels landed 82,541,000 pounds of seafood, with an ex-vessel value of \$93,869,000.⁶ The 2011 Cornell report estimated that every dollar in landings translates to a total of \$2.49 in sales to Rhode Island businesses and \$1.79 in income to Rhode Island workers.⁷

...TO RHODE ISLAND'S FOOD SYSTEM

To state the obvious, fish is food. Local marine resources are a wild protein source that delivers an astounding diversity of options at a variety of different price points, from the very expensive swordfish to the very affordable sea robin. Fishermen

take great pride in their role as providers of nutrition and culinary enjoyment to their communities. Rhode Island chefs value the diversity of Rhode Island seafood and relish serving it to their guests in creative ways.

In 2016, Rhode Island fishermen landed 78 pounds of seafood (in the round) for each of the state's 1.056 million people. Rhode Island squid boats alone landed enough volume for every Rhode Islander to dine on squid once per week all year long. Well cared for, these naturally abundant resources will continue to provide nutrition for Rhode Islanders for generations to come.

...TO RHODE ISLAND'S HERITAGE AND CULTURE

Rhode Island's sense of place is deeply rooted in the coast. Perhaps nothing is more "Rhode Island" than a picturesque quahog skiff silhouetted against the sunrise on Narragansett Bay. Rhode Island's working fishing ports are interwoven with its recreational economy and add value to it. When tourists and day-trippers catch a glimpse of the fishing boats of Point Judith from Salty Brine State Beach or the Block Island ferry, or when they bite into a lobster roll at the Newport Lobster Shack, they celebrate and enjoy the value of Rhode Island's commercial fishing heritage. Year-round residents also derive value and meaning from our local fisheries. The opportunity to eat fresh, locally landed seafood and meet the people who caught it is an amenity that enriches the Rhode Island experience in many ways.

CHALLENGES AND OPPORTUNITIES

When fishery participants pause to look at the horizon and imagine the future of their industry, few feel optimistic. Yet there are glimmers of hope all around for those who look hard. To achieve the vision outlined in the *Blueprint for Resilience*, fishery participants and their partners in the public, government, and civil society will need to simultaneously address the mounting challenges facing the industry and nurture these scattered seeds of a better future.

CHALLENGES

MOUNTING REGULATORY STRAIN

Compared to other parts of our food system, fisheries are disproportionately affected by formal government regulatory processes. There are many different licenses, species-specific regulations, gear requirements, vessel requirements, open and closed seasons, and paperwork and compliance requirements that prescribe fishermen's actions on a daily basis and constrain the decisions they make about their businesses. While public management of any public resource is critical to maximizing public benefit, the regulatory complexity characterizing fisheries at present is unique among food industries in Rhode Island.

The outsized role of government management in fisheries – and a feeling among industry members that there is little they can do to influence it – affects industry morale, leads to a loss of sense of agency among fishermen, and reduces the adaptive capacity available to industry to solve its own problems. Specific aspects of today's regulatory structure that stand in the way of greater resilience include regulatory discards, time lags between data collection and policy decisions, the piecemeal nature of management, and management-induced specialization of fishing businesses. Each of these is discussed in detail below. Targeting these specific shortcomings can help overcome the often adversarial nature of business-government relations in fisheries.

REGULATORY DISCARDS

Regulatory discards occur when fishermen catch species that they are not allowed to land (e.g., because they do not possess a permit or quota to harvest them, because the season is closed, or because they are not allowed to land certain species while targeting others) or when they catch a greater volume of a species than they are allowed to land and must throw the overage back.

Climate variability and warming waters exacerbate the problem of regulatory discards, especially when the volume of a species that fishermen are allowed to land is determined by outdated historical population data in the area. For example, staggering amounts of black sea bass and fluke must be thrown back at present, due to low daily limits based on history-based allocations that are out of sync with today's ecosystem. Scientific and regulatory uncertainty, which are likely to continue (if not increase) in a changing climate, contribute to the discard problem by requiring higher precautionary buffers in allowable catches. Management-induced specialization also plays a role, since fishing operations with access to only a few species must throw back a greater proportion of a mixed catch than those with access to many species. Although fishing operations maximize their selectivity through use of gear technology and trip planning, there is only so much they can do to avoid discards, particularly as the ecosystem around them changes.

TIME LAGS

The fisheries management process begins with data collection - mostly in the form of Federal and State trawl surveys - and then proceeds to data analysis, modeling, prediction, peer review, regulatory proposals, public comment and final approval of the regulations before they can be implemented and enforced. From start to finish, this process sometimes takes several years.

With today's increasing level of environmental variability, ecological changes are happening more quickly than the scientific-regulatory process is able to recognize and process them. As a result, some regulations are all but outdated by the time they are implemented. Regulated fishermen often find themselves caught in a gap between natural and human cycles that are operating at different speeds. Depending on the nature of this mismatch, this problem can lead to increased regulatory discards, stranded equipment investments, forfeited economic opportunities, incentives to high-grade (catch more fish than one needs and selectively retain the highest-value fish), and incentives to over-exploit vulnerable stocks.

REGULATORY FRAGMENTATION

Since the passage of the Magnuson Stevens Fisheries Management and Conservation Act in 1976, American fisheries management has been premised on a single-species, single-driver framework: each species is managed independently of others and fishing activity is treated as the only factor affecting the abundance of fish stocks. Impacts from non-fishing sources such as pollution, climate change, invasive species, coastal and offshore development, and predator-prey relations (to name a few) are largely ignored, despite their significance in driving ecosystem dynamics.

Managing each species as an independent unit - when in reality they are all interconnected - is a recipe for failure, and scientists recognize that it is not possible to attain maximum sustainable yield for all fisheries at once. Without considering trade-offs between the abundances of different species and addressing impacts other than fishing that affect these species, fisheries management will continue to fall short of its own stated goals and frustrate the fishermen whose businesses depend on good management.



SPECIALIZATION

“When I was younger... if everything went south dragging, I could go clamming. Or I could drag a scallop dredge. Or I could do this kind of fishery or that kind of fishery. Now they’ve licensed everybody so that you can’t make a change. So now it’s ‘This is what *you’re* doing, this is what *you’re* doing, this is what *you’re* doing, and this is what *you’re* going to die doing. Unless you come up with a lot of money to buy somebody else’s something.”

**-Charlie Brayton
F/V Kelsi and Morgan, Snug Harbor**

BUSINESS SPECIALIZATION

Rhode Island fishing businesses, once highly versatile, are becoming increasingly specialized. In large part, this is due to fisheries management's increasing reliance on fishery-specific (e.g., species- or gear-type) permits and individually assigned catch or trap allocations. Although these management tools offer some benefits, such as protecting the investments of businesses with long-standing interest in a particular fishery from opportunistic competitors, they also contribute to an overall movement away from the flexibility and general-purpose business models that made fisheries adaptable in the past. Crossing into new fisheries can be exceedingly expensive if not impossible, and fisheries with a lower barrier to entry can become magnets for effort, attracting greater numbers of boats and higher levels of fishing activity. This latter pattern has played out in the shift of many Rhode Island draggers from groundfish to squid fishing, a trend that leads both to specialization at the vessel level and to homogenization at the fleet level.

Specialization, especially when it results from fisheries management structures (as opposed to market incentives or ecosystem dynamics) can severely inhibit the ability of fishing operations to adapt to changes in the timing, spatial distribution, and composition of local fish stocks. It also makes it harder for the industry to respond to changes in price and consumer demand for fishery products.

WITHERING OF THE WATERFRONT

Vessels in Rhode Island's fleet are aging. High costs of doing business, costly safety requirements, and the regulatory uncertainty that plague many fisheries make it more difficult to invest in new vessels and vessel overhauls. An aging fleet can increase the vulnerability of its fishermen's lives and profits, and drive up insurance costs.

Compared to decades past, fleets in most ports are also much smaller than they used to be. One aspect of fleet downsizing is consolidation – an ongoing trend that is partly driven by economics and partly by fisheries management choices.

LOSS OF WORKING WATERFRONT

"When I came to Newport at first, there was a waiting list to tie at the state pier. Now there's empty spots. You've got an unfriendly fishing port now. We don't even have a marine place anymore. Now you got to go to Wakefield or New Bedford. There's no longevity in Newport. Not the way it's going now. They've taken the infrastructure away. You used to be able to get diesel at Parascandolo's, and sell your fish and get your ice. They even used to have an ice company in town. Now that's gone."

**- Harry Gould
F/V Olympia, Newport**



Consolidation can be a result of individual fishermen doubling up on permits to increase their catch or trap allotment, individuals buying additional types of permits so they can pursue a wider range of fisheries, or companies buying up boats and permits when their original owners can no longer afford to stay in business. Consolidation is a double-edged sword: on one hand, it is an adaptation to changes in the business environment. On the other, it is itself a fundamental change in the social and cultural character of the fishing industry that can precipitate socioeconomic ripple effects and a loss of pride. For example, smaller fleets can mean less demand for the services of some shore-side businesses.

All the while, working waterfronts have to contend with coastal gentrification and expansion of the tourism industry. Seafood buyers, bait and ice providers, shipyards, and gear shops have become less numerous than they once were, and some ports that once hummed with activity have fallen silent. Newport has been especially hard hit, but even the state's flagship port – Point Judith – is not immune. The State's strong commitment to

maintaining these two ports as commercial waterfront is a blessing, yet today's senior fishermen remember a time when these ports were much more vibrant.

RISING BUSINESS EXPENSES

The inputs to a successful fishing business include fuel (gasoline or diesel), licenses/permits, catch quota, vessel maintenance, and the costs of regulatory compliance. At the time of this writing, fuel was reasonably priced, but fishermen remember a time in the recent past when its cost was so high that it put some fishermen out of business. Vessel maintenance and haul-outs have become more expensive in recent decades, in part due to the closure of several boat yards. Purchase and leasing of quota in catch-share fisheries and trap tags in the lobster fishery are additional expenses that most of today's fishermen did not have to deal with when they were younger. On-again-off-again requirements to pay the costs of carrying third-party observers have had a grip on ground-fish boats in recent years, and other fisheries are on edge about this trend.

MARKET STAGNATION

"The bottom line with the consumer is the price. If you're charging \$82 a bushel for littlenecks, and you've got Virginia littlenecks for \$72, they'll buy that. So we're competing in a world that has a lot of product on the market, and it's inferior, but a lot of customers don't see it that way. And then, it's not always available, because of the closures and because of not having the men to harvest it. I think the state should open up the licenses.⁸ We need more young blood. My youngest guys are probably in their 40s. My youngest guys."

**- Dave Andrade
Andrade's Catch, Bristol**



MARKET DYNAMICS

Today's seafood marketing system contains a few unsettling realities. Over 90% of the seafood consumed by the American public is imported from other countries, and much of the seafood landed domestically – including in Rhode Island – is shipped overseas. Dependence on export markets can bring good returns when those markets are strong, but fluctuations in currency exchange rates, changes in technology and labor markets, foreign subsidies and tariffs, and consumer tastes abroad can all affect the price that Rhode Island fishermen and seafood wholesalers receive for their products.

Market stagnation and volatility are a big problem for certain fisheries. One of these is scup: in response to a steep cutback in the allowable scup catch the early 2000s, retail markets began to substitute cheap imported tilapia. Now, although the scup biomass is at record highs, markets haven't fully recovered. Low scup prices sometimes fail to provide adequate compensation for the effort required to catch and land the allowable catch quota, and fishermen leave scup quota in the water, year after year. Another example is the quahog: a slump in quahog landings in the 1990s created a void in supply that was filled with farmed quahogs from Chesapeake Bay states. As a result, Rhode Island lost its market share. Only recently has Rhode Island begun to regain its market dominance, spurred partly by a reduction in grant-based subsidies offered to Virginia growers.

PUBLIC APATHY

When today's older fishermen were younger, their communities viewed them as heroes – adventurous outdoorsmen who braved the seas and weather to bring home a healthy dinner for their communities. Somewhere along the line, a different narrative crept in: the fisherman as a greedy ravager of the seas or troubled ne'er-do-well. These archetypes act subliminally to prevent members of the Rhode Island public from feeling the same warmth and excitement about wild-harvest fisheries as they do about farmers and aquaculturists.

A general sense of isolation from the public has a negative impact on the fishing community's morale, with downstream impacts on the industry's recruitment of young people, propensity to adapt and innovate, and ability to work with entities outside the fishing industry to solve some of the problems facing the fleet. Many fishermen would like the State to do more to promote local seafood and to confer greater value and respect on fishing as a job creator and food-producing enterprise.

SHORTENED PLANNING HORIZONS

Because of many of the stressors described above, fishermen are operating under a truncated business planning horizon. Uncertainties about the natural environment, political environment, regulatory environment, and economic environment conspire to make long-term planning risky. Instead, most fishermen operate defensively - focused on coping with today's challenges and trying to stem additional losses - rather than aspirationally, with an eye towards a better future.

A LOST GENERATION

There was once a time when docks swelled with young people looking for fishing jobs. Today, fewer young people aspire to careers in fishing, and those who do are often stopped short by a lack of training, lack of financing, discouraging attitudes from established fishermen, and the increasingly high cost of buying vessels and permits.

Meanwhile, captains in need of qualified crew struggle to fill vacancies. Retiring fishermen find few individuals able to buy their businesses at full value – leaving them with little option but to sell to companies or larger operations. This type of succession reinforces a trend towards consolidation and corporatization of the fleet that irrevocably alters the character of local fisheries. Additionally, with today's limited pool of qualified crew and captains available to staff existing fishing operations, some inshore captains now fish single-handed or take unqualified crew, contributing to a decrease in safety and efficiency.

THE PITFALLS OF PLANNING

"You know day to day what you're doing, but you can't look too far down the road, because something is always going to bite you in the ass. If you look too far ahead of what you're doing for each trip, it becomes very unpredictable. You can't look too far down the road in this business."

- Tim Rakovan
F/V Anne Kathryn, Point Judith



PUBLIC APATHY

"You're constantly trying to fight the rear guard action to maintain your fishery, and it never goes away. It's a public opinion war."

- Dave Blaney, marine surveyor
Blaney Marine



LACK OF YOUTH

"Who's going to continue this? It's a really cool way of life. I love the independence and the fact that my mind and my will are the tools I have to pull money from the ocean. I'd like to see it continue. But the average age is like 55 or 57."

- Aaron Gewirtz
F/V Nancy Beth, Point Judith

"Greying of the fleet" is a multifaceted challenge. It is as much regulatory (limited licenses, specialization, individual quota systems) as it is cultural (emphasis on the college-to-profession pathway, discouragement by current fishermen), economic (rising costs of doing business, market stagnation and volatility), financial (lack of loans or information on where to get them), and educational (shortage of training programs). Every one of these dimensions has changed in profound ways since today's senior fishermen entered the industry and built their careers. All of them need to be addressed simultaneously to reverse the problem.

INDIVIDUAL ISOLATION

Communication channels and social capital – the network of relationships in a community – are critical enablers of resilience. Yet despite the small size of fishing ports and the active gossip channels that crisscross the fleet, many fishermen retain a skepticism towards each other that stems from the fact that at sea and in the marketplace, they are economic competitors.

There is no simple way to communicate across the fleet. Fishermen have jumped into the internet age at varying paces. Weather-dependent schedules interfere with their ability to attend meetings. Information asymmetries across the fleet can stand in the way of transparency and trust. A shortage of people willing to step into leadership roles means that industry leaders can be overworked, underappreciated, and in positions of influence for too long without cultivating the next generation of leaders. When they retire from these roles, there can be a leadership vacuum in their wake that takes time to recover from.

ENVIRONMENTAL VARIABILITY AND CHANGE

The environment is changing. Some once-familiar species have moved away and newcomers have taken their place. Temperature, rainfall, and other factors make each year different from the last. Unfortunately, fisheries management has traditionally regarded temperature and other environmental factors as statistical "noise" and left them out of the models used to manage fish stocks.



NEED FOR INDUSTRY COHESION

"This industry is probably the most competing industry ever. All of us have competing interests. There has to be something overriding those extreme competing interests. That something is good leadership, the equal application of the law, and equal access to the resource."

- Jerry Carvalho, Wickford



SHIFTING FISH DISTRIBUTIONS

"In the last few years, sea bass has exploded. The body of fish has shifted. That was a big Mid-Atlantic species – like Carolinas, Virginia. Now they're seeing them north of the Cape. Our regulations need to catch up with where the fish are. The limits don't allow you to make a day's pay."

**- Derek Pascale
F/V Ragged Edge, Point Judith**

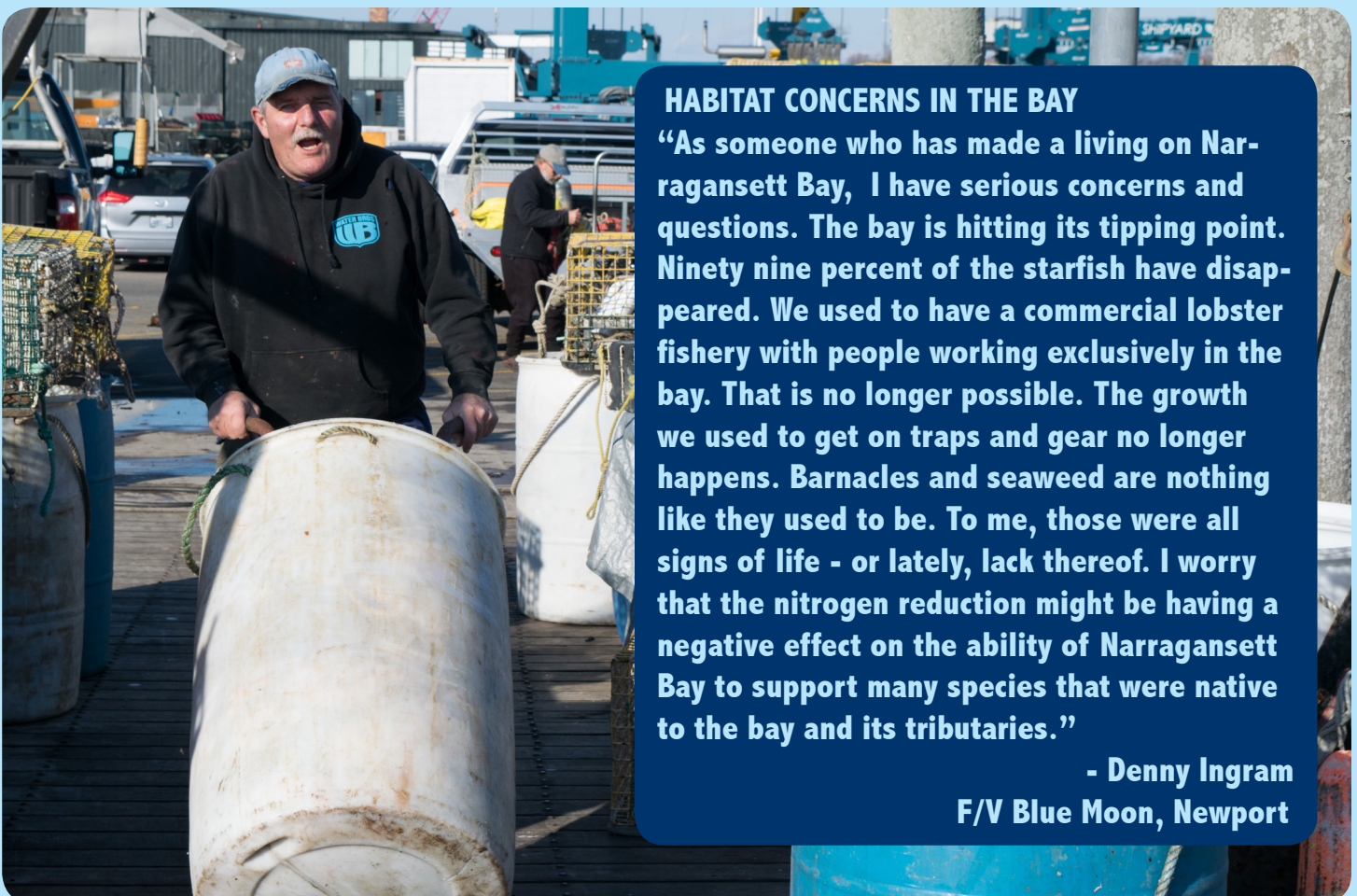
Although the impacts on fisheries from global climate change have only recently become a hot topic, fisheries have always been affected by natural temperature cycles and variability. Global trends, regional cycles, and other circulation and weather patterns occur at a variety of spatial and temporal scales. To put it plainly, the ocean has never been static. However, the system of fisheries management that has evolved since the 1970s generally acts as though it is.

When a highly variable environment meets a rigid, slow-moving management system, it can produce a suite of challenges for the fishing industry. One of the biggest is jurisdictional. When Congress established the Magnuson Stevens Fisheries Conservation and Management Act in 1976, it granted authority over scup, fluke, black sea bass, squid, butterfish, monkfish, bluefish, and dogfish to the Mid-Atlantic Fishery Management Council, a body that includes states from North Carolina to New York – but not Rhode Island (or Connecticut). Since the 1980s, Rhode Island fishermen have grown increasingly dependent on these

“Mid-Atlantic” species, and these fish have become more abundant in the waters where Rhode Island fishermen fish. Yet, Rhode Island fishermen to date have no formal say in how these species are managed.

Another climate-related regulatory predicament stems from the practice of distributing quota to states according to historical landings, a practice that is applied to species like fluke and black sea bass – two species that are becoming more plentiful near Rhode Island as waters warm. Due to reliance on history-based landings quotas, Rhode Island fishermen are allowed to keep only a small fraction of the black sea bass and fluke that they catch, and must return overages to the water (often dead) – a waste to both the fishermen and the resource.

As these examples highlight, the primary problem with environmental change is not the occurrence of change itself, so much as the fact that the fisheries management system has not found a way to keep up with it.



HABITAT CONCERNS IN THE BAY

“As someone who has made a living on Narragansett Bay, I have serious concerns and questions. The bay is hitting its tipping point. Ninety nine percent of the starfish have disappeared. We used to have a commercial lobster fishery with people working exclusively in the bay. That is no longer possible. The growth we used to get on traps and gear no longer happens. Barnacles and seaweed are nothing like they used to be. To me, those were all signs of life - or lately, lack thereof. I worry that the nitrogen reduction might be having a negative effect on the ability of Narragansett Bay to support many species that were native to the bay and its tributaries.”

**- Denny Ingram
F/V Blue Moon, Newport**

HABITAT DEGRADATION

Coastal and marine habitat is as critical to fish as soil is to farm crops: it is the foundation for all ecosystem health, upon which commercial yields depend. Although fisheries science has not been able to compute quantitative relationships between habitat and fish yields for most species, scientists and fishermen alike know that this linkage is strong, particularly for species that depend on particular habitats for certain stages of their lives.

Rhode Island faces a significant challenge when it comes to fish habitat: its human population is dense and located close to the coast. Urban centers and suburban sprawl along the perimeter of Narragansett Bay, the coastal salt ponds, and the ocean shore yield a cocktail of stressors that includes wastewater, pharmaceuticals, lawn chemicals, pesticides, and hardened shorelines. Recently, Rhode Island invested in a wastewater treatment overhaul that resulted in a 50% decrease in the nitrogen entering Narragansett Bay. Now, some fishermen are questioning whether this effort to “clean” the bay has gone too far, causing a drop-off in ecological productivity. Offshore, the impacts of energy development and mining proposals raise questions about impacts to bottom habitats. Fishermen are advocating steps to understand and mitigate the effects of these potential stressors on fisheries habitats.

COMPETING OCEAN USES

There was a time when all ocean use in New England was transitory. Fishing boats, ferries, Navy ships, and shipping vessels came and went, leaving the surface of the ocean much as they had found it. But a new ocean economy is now unfolding, characterized by a more permanent and varied industrial presence at sea. Beginning with the widely hailed unveiling of five wind turbines south of Block Island in 2016, Southern New England is on a fast track to develop its renewable energy resources. Wind energy development entails not only the erection of hundreds of vertical towers that stretch from seabed to surface, but also the laying of hundreds of miles of underwater cable, increased vessel traffic, and disruption caused by construction activities. Meanwhile, oil and gas drilling, sand and gravel mining, and marine protected areas have all been the subject of contentious debates during the two-year Resilient Fisheries RI process that resulted in this *Blueprint*.

These changes have implications for many aspects of importance to commercial fisheries, including safety, navigation, access to fishing grounds, insurance, and ecological health. Coupled with other changes, such as shifting fish migration patterns and evolving working waterfront economies, they contribute to an acute sense of uncertainty about the future of commercial fisheries in Rhode Island.

WIND FARMS

“Wind farms in their current proposition are all but assured to displace fishermen and force them into tighter fishing areas. And who is to say how stocks of commercially-caught species will react to the introduction of hundreds of thousands of tons of steel and the impacts of construction and vessel activity? Fishermen and the ocean environment are in jeopardy of being casualties to a process that is moving forward without due diligence in terms of baseline research and socio-economic consequences.”

- Greg Mataronas

F/V Cailyn Grace, F/V Second Nature, Sakonnet Point



OPPORTUNITIES

RHODE ISLAND'S LOCAL FOODS COMMITMENT

Rhode Island is having a love affair with food. The explosion of farm-to-table restaurants, farmers' markets, shared processing kitchens, food training programs, and food pop-ups in the last decade is truly astounding. Local food in Rhode Island is both a growth industry and a dazzling cultural phenomenon. It is also enshrined in civic and governmental policy. In 2011, the Rhode Island Food Policy Council was formed and commissioned the *Rhode Island Community Food Assessment*.⁹ Five years later, the Governor hired a Director of Food Strategy, and in 2017, the *Relish Rhody Rhode Island Food Strategy*² was published.

The *Rhode Island Food Strategy* affirms Rhode Island's commitment to a regional goal first outlined in the *New England Food Vision*¹⁰ of 2014: to obtain fifty percent of the food eaten in New England from within the region by the year 2060. This is a commitment that includes local wild seafood. "Commercial fisheries are part of the fabric of Rhode Island and an economic and employment boon for the state," the *Strategy* affirms.

Rhode Island's focus on food can help fisheries in much the same way it has helped farmers and

aquaculturists: by cultivating public awareness and support, opening new market channels, and increasing the visibility of the industry to young people deciding on a career.

However, wild fisheries lag behind agriculture and aquaculture in taking advantage of the local foods movement. A prominent reason for this disparity is that health regulations currently bar the direct sale of seafood products (except lobster and crab, which are sold live) from fisherman to consumer. Seafood – a highly perishable product – is simply not as easy or as safe to sell in a community-based economy as produce is. Moreover, a great deal of uncertainty surrounds the regulatory requirements that apply to seafood sales (e.g., what kind of entity may sell to what other kind of entity, what licenses and equipment are required, and what paperwork is involved). To truly unleash the potential of the local foods movement for wild fisheries, innovative ways of overcoming these hurdles must be found. Until then, members of the fishing industry will continue to participate in the local foods movement as they have until now: hosting sea-to-table dinners, engaging in the Rhode Island Food Policy Council, coordinating dockside educational presentations, and joining in seafood demos, festivals, and special events.

DIRECT MARKETING

"Other states have set the models for off-the-boat sales, community supported fisheries, and dockside fishermen's markets. Rhode Island needs to mirror what other states have established. I've learned about what's happening on the land side of the food movement, and we really need to pull together as an industry to keep our fish in the local community because fish is food."

**- Dawn McAlister
Ocean State Community Seafood**



COLLABORATIVE MARKETING

“Quahog Week has helped highlight the great-tasting shellfish and the hard-working Rhode Islanders that make up an important part of our local economy.”

**- Mike McGiveney, quahogger
Allen Harbor**



COLLABORATIVE MARKETING

In 2011, the Rhode Island General Assembly created the Rhode Island Seafood Marketing Collaborative, a group that includes members of the fishing and seafood industry and representatives of several State agencies whose purviews intersect with seafood: Department of Environmental Management, Department of Health, University of Rhode Island, Rhode Island Commerce Corporation, and more. The Collaborative's chief accomplishments have been the creation of a Rhode Island seafood branding logo, which is now in use by many of the state's seafood dealers, and the launch of Rhode Island Quahog Week. Quahog

Week takes place each year in March – a time when quahog sales are slow – and invites restaurants across the state to participate by offering quahog specials. If the Collaborative were better funded, it could be a stronger foundation that could be built upon in the years ahead.

NEW ATTITUDES IN MANAGEMENT

Relationships between fishermen, fisheries scientists, and regulators has often tended towards tension and mistrust. But several recent appointees to high-level positions within State and Federal fisheries science and management structures have given Rhode Island fishermen hope. These



NEW ATTITUDES IN MANAGEMENT

“New leaders have given us the opportunity to work with scientists, which should develop more trust within the industry and help make more informed decisions.”

**-Rodman Sykes
F/V Virginia Marise, Point Judith**



EMERGING SPECIES

“We are seeing some new fish from time to time. Some croaker. Some spot. We’re seeing species move from the south up to the north. Anything that I can put through the building and provides a product for Town Dock and dollars for the fishers, I’m going to have to take a look at it. The thing about fish moving up, whether it’s croakers or spots, it’s no different from our fish being up in Maine now.

**- Mike Roderick, Director of Purchasing
Town Dock, Point Judith**

new leaders bring with them a spirit for working collaboratively with fishermen and a holistic perspective on fishery ecosystems. After many years of tension and communication barriers between these groups, new leaders represent a refreshing change that bodes well for industry resilience.

EMERGING SPECIES

While warming waters spell farewell to some common species that have been part of the Rhode Island portfolio in the past, they also lay out a welcome mat to new species whose ranges are expanding northward from the Mid-Atlantic. While Rhode Island may lose cod, lobster, and winter

flounder, it will likely continue to gain increasing quantities of scup, black sea bass, fluke, butterfish, and squid. Although the warming of local waters has only recently begun to make the headlines, this transition has actually been underway for a generation: offshore fishermen have tracked a northeastwardly movement of fish since at least the 1990s. This trend is becoming more pronounced each year – to the point where fishermen and wholesalers are exploring new markets for locally caught southern species. If developed properly and managed adaptively, these new fisheries will offer opportunities to Rhode Island fishermen and dealers to diversify and thrive.

ECOSYSTEM-BASED FISHERIES MANAGEMENT

“I think that ecosystem-based [management] is probably the future of it. We can’t keep pounding on one species. Because they’re all related, whether we like it or not. They’re all intertwined in their little lives, and we disrupt it way too often. Even building a house in a swamp disrupts it. Outfall from sewer systems disrupts it. So if we take it all as a picture, maybe we can straighten out the mess we’ve made.”

**- Mike Hall, fleet support
Town Dock, Point Judith**



ECOSYSTEM MODELS FOR MANAGING FISHERIES

Ecosystem-Based Fisheries Management (EBFM) and the Ecosystem Approach to Fisheries Management (EAFM) are new, holistic models for managing fisheries that are gaining ground as replacements or enhancements to the single-species style of management that has prevailed since the 1970s. These new approaches bring greater realism to fisheries management by looking at the big picture. For example, rather than managing each species in isolation – as conventional management approaches do – an ecosystem approach considers food webs in their entirety. Rather than managing fishing activity as the exclusive driver of fish stock abundance, it may also take into account habitat alteration, climate change, predator-prey dynamics, and natural variability.

Of the three management bodies that have decision-making authority over fisheries of importance to Rhode Island – the Atlantic States Marine Fisheries Commission (ASMFC), the Mid-Atlantic Fishery Management Council (MAFMC), and the New England Fishery Management Council (NEFMC) – two are implementing or planning to implement some form of ecosystem approach. In 2011, the MAFMC initiated development of an Ecosystem Approach to Fisheries Management Guidance Document to enhance its existing species-specific management programs by adding broader ecosystem considerations, science, and management policies that coordinate Council management across species. In 2014, the NEFMC convened an EBFM Committee to provide advice to the Council on implementation of an ecosystem-based fisheries management plan (work which is still underway).

GOALS AND STRATEGIES

Through the workshops and scenarios planning exercise that led to development of this *Blueprint*, Rhode Island fishermen identified seven core strategy areas that are key to a long-term resilience effort for their industry:

- Public relations
- Civic engagement
- The next generation
- Innovative seafood marketing
- Working waters and coastlines
- Healthy habitats
- Adaptive science and management

Some of these strategies can be implemented by members of the fishing industry themselves, by working together. Others will require collaboration with State or Federal agencies, local municipalities, members of the scientific community, financial and philanthropic institutions, educational institutions, community partners, the media, or the public at large.

STRATEGY AREA: PUBLIC RELATIONS

Public support is a key ingredient to the success of any industry. In fisheries, many aspects of resilience hinge on a supportive public, including State and Federal investments in working waterfronts, neighborhood support for commercial access to the shoreline, recruitment of young people, marketing of the industry's products, and a supportive fisheries management context. The very resources that wild-harvest fishermen capture belong to the public, and earning public respect through engagement, education, and media relations is simply a part of doing business.

The local foods movement offers the fishing industry a unique opportunity to reconnect with the public. Given the fact that fishermen cannot easily sell their catch to the public directly, fishermen must work harder than other producer communities to reap the benefits of this wave of interest in local foods. Working hand in hand with food organizations, State and town government entities,

and extension agents to develop robust pathways towards public engagement can reinforce public understanding and appreciation for the industry.

Goal: Enhance public understanding and appreciation of Rhode Island's wild-harvest fishing industry

Tactic 1. Integrate cause marketing into seafood sales to raise appreciation of the fishing industry

The primary interaction that most people have with the fishing industry is through the fish on their plates. This interaction is underleveraged as an awareness-raising opportunity. Private companies as well as public marketing efforts like the Rhode Island Seafood Marketing Collaborative are well poised to integrate positive messages about the fishing community into their public outreach and sales activities.

Tools: retail posters, table tents, product labels, QR codes

Tactic 2. Promote opportunities for the public to meet fishermen face to face

Fishermen are the best ambassadors for their industry. Yet it can be difficult for the public to get to “know their fishermen” because fishermen spend so much time at sea. This can be corrected by providing avenues for fishermen to speak directly to the public and for members of the public to engage directly in the fisheries experience, as agriculture and aquaculture have done through farm tours and pick-your-own opportunities.

Tools: dockside sales, classroom presentations, boat-to-table dining events, creation of a fishermen speakers’ bureau, training for fishermen in public speaking, public storytelling events, fisherman-for-a-day heritage charters, harbor cruises

Tactic 3. Promote opportunities for the public to visit and interpret working waterfronts

The physical infrastructure utilized by fisheries is a high-visibility asset that can be used to incite public excitement and interest. Working waterfront walking tours, interpretive signage trails, and public events in fishing ports are promising tools

for public engagement and education that are already being used successfully in some ports and should be expanded and enhanced.

Tools: interpretive signage tours, waterfront walking tours, blessing of the fleet, harbor festivals

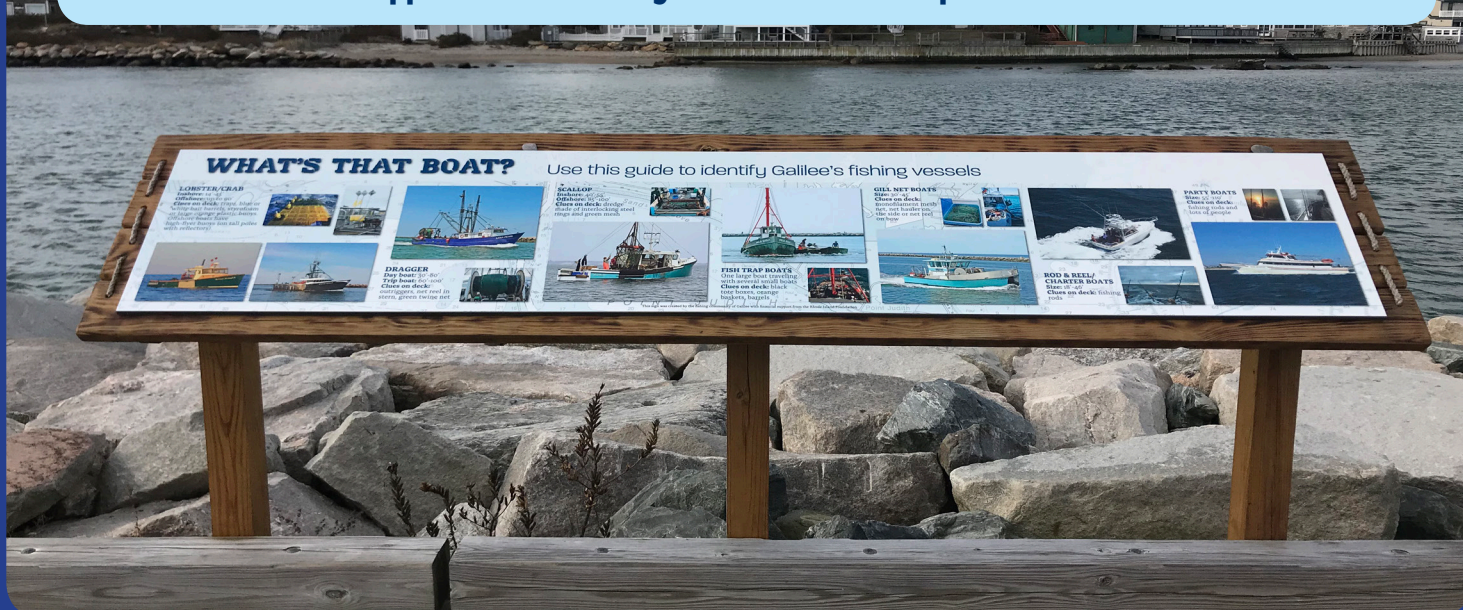
Tactic 4. Tell the industry’s story through media and the arts

Fishing is a photogenic and alluring activity that produces no shortage of evocative images and stories for the web and print journalism. For similar reasons, many writers, photographers, and artists have found inspiration on the docks and decks of Rhode Island fisheries. Fisheries participants can continue to help the media and artists tell meaningful stories about Rhode Island fisheries by courting relationships with these communities.

Tools: press kits and backgrounders, artist-in-residence programs in fishing ports, work with local institutions (e.g., Metcalf Institute for Marine and Environmental Reporting, Rhode Island Council for the Humanities, Rhode Island State Council on the Arts) to tell the story of Rhode Island fisheries through expressive and journalistic media

POINT JUDITH INTERPRETIVE SIGNAGE TRAIL

In 2017, fishing industry members in Point Judith partnered with the nonprofit Eating with the Ecosystem to install ten interpretive signs. These signs now greet tourists and locals, inviting them to discover and appreciate the fishing activities that take place there.



STRATEGY AREA: CIVIC ENGAGEMENT

Today's uncertain environment makes it more important than ever for members of the fishing industry to put aside differences and work together. Not all fishermen share all of the same interests, but where they do, they can work collectively to address them. Fostering collaboration among members of the industry and providing opportunities for engaging productively with decision makers is a first and necessary step to promoting almost all of the strategies outlined in this report.

Goal: Increase coordination among members of Rhode Island's fishing industry to speak collectively on issues that affect them

Tactic 1. Establish transparent grassroots communication channels among the fishing industry

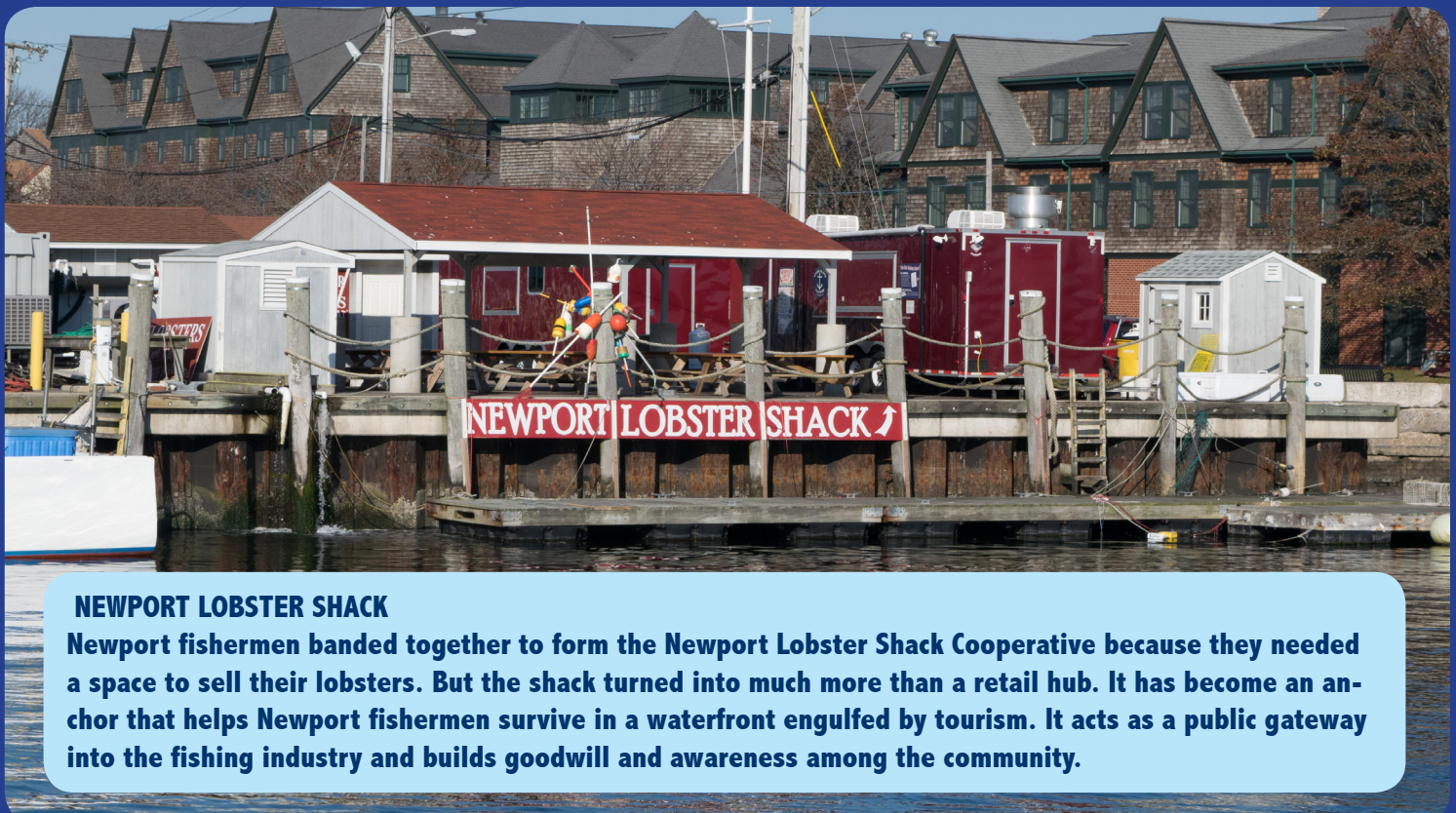
Fishermen spend most of their time on the water, away from computers, phones, and meeting rooms. It's easy for them to become disconnected from decisions that affect them. Enhancing the variety of ways that industry members communicate with each other can go a long way towards building trust, transparency, and social capital. An

all-of-the-above approach utilizing both online and offline methods can reach and empower the greatest number of industry participants.

Tools: social media, listservs, web forums, webinars, posters, bulletin boards, postal mailings

Tactic 2. Achieve strength in numbers through a pan-industry body

Rhode Island has a plethora of industry associations representing different fisheries, gear types, locations, or ideologies: the Rhode Island Fishermen's Alliance, Rhode Island Commercial Fishermen's Association, Rhode Island Commercial Rod and Reel Association, Rhode Island Lobstermen's Association, Rhode Island Shellfishermen's Association, Ocean State Fishermen's Association, Sakonnet Point Fishermen's Association, Rhode Island Monkfish Association, and Rhode Island Whelk Fishermen's Association. Rhode Island fishermen also belong to regional groups like the Atlantic Offshore Lobstermen's Association, Center for Sustainable Fisheries, Eastern New England Scallopers' Association, Southern New England Fishermen's and Lobstermen's Association, Northeast Seafood Coalition, and Massachusetts



NEWPORT LOBSTER SHACK

Newport fishermen banded together to form the Newport Lobster Shack Cooperative because they needed a space to sell their lobsters. But the shack turned into much more than a retail hub. It has become an anchor that helps Newport fishermen survive in a waterfront engulfed by tourism. It acts as a public gateway into the fishing industry and builds goodwill and awareness among the community.



MODEL FROM ANOTHER STATE

Virginia's Watermen Heritage Tours offer members of the public the chance to experience the Chesapeake Bay with an authentic working waterman as their personal guide. These charters blend history, culture, and ecotourism to build community and understanding between fishermen and the public.



COLLABORATIVE PROBLEM SOLVING

The Resilient Fisheries RI project that produced this *Blueprint* utilized a decentralized network collaboration model. Network approaches emphasize transparency, horizontality, and a culture of active engagement that incorporates every individual's unique contribution. They do not supplant the efforts of organizations; rather, they strengthen the ability of participating organizations and individuals to communicate laterally with the broader industry and to form strategic collaborations across ports and gear types.

Lobstermen's Association. Activity levels of these associations wax and wane based on need and leadership, and some are currently dormant. One organization, the Rhode Island Commercial Fisheries Center based at the University of Rhode Island's East Farm campus, is a federation of individual fishery associations.

Examples of successful statewide fishing industry bodies in other states are not hard to find, and investing in a strong central fisheries organization in Rhode Island could pay off in many ways. However, the capacity of a pan-industry body to represent the fishing industry of Rhode Island hinges on the faith of its members and the good governance of its leaders. Working collectively to establish a strong core for collective action is critical to the ability of the industry to achieve many of the goals stated in this *Blueprint*.

Tactic 3. Provide civic empowerment and leadership training opportunities

The challenges facing today's fishing industry demand a skill set in public communication and civic engagement that not all fishermen have had a chance to develop. As more fishermen seek out opportunities to have a say in issues that affect them, they will need to develop the skills to perform well in these new spaces. Training modules on active citizenship, advisory structures, fisheries management, and environmental governance can help prepare fishermen, young and old, for participation in a greater spectrum of collaborative activities.

Tactic 4. Engage and educate elected officials

Educating decision makers about the fishing industry is as important as educating the public and the press. Instead of waiting until urgent issues present themselves, the fishing industry and its partners should proactively establish regular, low-pressure opportunities for elected officials and fishing industry participants to get to know each other and build shared understandings of the critical issues.

Tools: coordinate an annual Fisheries Day at the State House modeled after Rhode Island's successful Ag Day; host election-year candidates' forums on fisheries issues; provide briefing books to newly elected officials

STRATEGY AREA: THE NEXT GENERATION

The low level of participation by young people and other new entrants in fisheries is a complex and pervasive problem, and there is no one action that alone can solve it. Overemphasis on one solution set without attention to others is likely to fail: for instance, training and education without access to licensing and financing can lead to dead-end career prospects for young fishermen, while access to licensing and financing without a concurrent emphasis on business and fisheries training can lead to failure and debt.

Moreover, the problem is characterized by a “chicken-or-egg” syndrome: young fishermen themselves are the best advocates for solutions that support them, but without implementing other strategies first, the pool of existing young fishermen will remain too small to advocate on its own behalf. Solving this all-important challenge will require participation by multiple actors engaging along a broad and balanced spectrum of problem solving. For late-career fishermen, helping newer fishermen to achieve the same opportunities that they had can be a rewarding part of the legacy they leave to the future.

Goal: Recruit, train, and support the next generation of Rhode Island fishermen

Tactic 1. Inform and invite new people to fisheries careers

Many people do not know that fishing is a career that is available to them, and those who wish to secure fisheries jobs may not know how to find them. Recruitment methods that worked in the past – such as relying on word of mouth or waiting for job seekers to show up on the docks asking for work – may not work as well as they once did. New methods are needed, and fishermen can explore a range of online and offline options by leveraging their collective networks to promote the industry to career-seekers.

Tools: career days at local high schools, working waterfront tours for school groups, online fisheries jobs bulletin board, “Become a fisherman” guides

Tactic 2. Impart skills and confidence through training and apprenticeship

Many of today’s seasoned fishermen got their start through the University of Rhode Island’s two-year Associate Degree in Fisheries. Since the closure of that program in the 1990s, there has been no formal program where aspiring fishermen can prepare for a successful and well-rounded career in Rhode Island fisheries. The years 2016 and 2017 saw the introduction of two new fishermen-sponsored educational pilot programs in Rhode Island fisheries (photographs on page 26). The fishing industry and its allies in State government and education should scale up programs like these to serve a broader fisheries constituency on a more permanent basis.

Tools: partner with vocational schools, colleges, and programs like Apprenticeship RI to develop fisheries-related curriculum, training programs, and apprenticeships; support the proposed Young Fishermen’s Training and Outreach Program (H.R.2079 - 115th Congress, 2017-2018)

Tactic 3. Improve access to financing

The costs associated with entering and building up a fishing career can be quite high, and include not only boats and gear, but also one or more licenses (State) and/or permits (Federal). Because of these high costs, retiring fishermen can have a hard time finding buyers for their boats, and rising fishermen have a hard time obtaining financing to buy in. Assistance with financing can help fishermen overcome this daunting hurdle as they transition from deckhands to owner-operators.

Tools: lease-to-buy options; permit banking; third-party succession counseling modeled after agriculture’s Land For Good

Tactic 4. Reduce / overcome barriers to licensing and access

Fishermen’s access to fish is governed by complex bundles of licenses/permits, quota, trap tags, and license endorsements, depending on the fishery and the jurisdiction involved. A cumulative pattern of increasing complexity and competition in



COMMERCIAL FISHERIES APPRENTICESHIP PROGRAM

In 2017, the Commercial Fisheries Center of RI launched a one-month crew training program targeted at recruiting a new cohort of qualified deckhands for the Point Judith fleet. The program included hands-on and classroom-based training sessions, with modules on safety, seamanship, navigation, vessel and engine maintenance, gear and net repair and operation, business skills, fisheries management, cooperative research, species identification, and discussion of the ethics of responsible fishing practices. In the program's first year, twelve prospective fishermen graduated and ten found and retained jobs on local boats.



Greg Maxwell
Commercial Shellfisherman

SHELLFISHERMEN'S INTERNSHIP PROGRAM

In 2016, the RI Shellfishermen's Association began a pilot internship program. The program provides online tutorials (pictured here) and pairs aspiring shellfishermen with experienced shellfishermen for mentorship. It is targeted at those under the age of 23 (who are eligible for free student licenses), but all those interested in a shellfishing career are encouraged to apply.



MODEL FROM ANOTHER STATE

The Alaska Young Fishermen's Network empowers the next generation of fishermen to be successful in their careers and communities. Through social media, gatherings (pictured here), and publication of a Young Fishermen's Almanac, the network creates opportunities for young fishermen to develop skills and connections, build resilient businesses, and be active and positive members of their fishing communities.

licensing and access can act as a barrier both to new fishermen looking to buy in and to established fishermen seeking to diversify their portfolios. Fostering emergence of a new generation of Rhode Island fishermen requires policy makers to identify aspects of today's regulatory environment that are inhospitable to new fishermen and take measures to develop viable pipelines to access, without sacrificing sustainability.

Tools: low-cost starter licenses that allow new fishermen to experiment; full-fledged apprenticeship programs in which standards-based training is a pathway to advanced standing in state license lotteries; relaxation of restrictions on license transfers from inactive participants to aspiring fishermen

Tactic 5. Foster fishing business viability

New fishermen will not succeed in the long run unless their businesses can become and remain viable. Many of the challenges described in the *Blueprint for Resilience* inhibit fishing business viability. Frequent regulatory upheavals and paperwork demands can lead to reduced business efficiency, truncated planning horizons, and a sub-optimal investment environment. Solving many of the challenges in this vision will help support new fishermen as they figure out the ropes. Increasing the viability of fishing businesses can enable captains to pay their crew better, leading to higher retention rates and higher likelihood that crew members will eventually graduate to own boats.

Tactic 6. Nurture support networks for new fishermen

Social support groups can help new fishermen overcome a sense of isolation as they struggle to succeed in a challenging career path where they are often a generational minority. The fishing and farming worlds nationwide are home to successful bottom-up programs like the Alaska Young Fishermen's Summit, Alaska Young Fishermen's Network, the Greenhorns, and the Young Farmer Network of Southeastern New England, which foster organic relationships among their participants. Rhode Island's young fishermen would benefit from a similar grassroots model for connecting with one another through networks of solidarity.

STRATEGY AREA: INNOVATIVE SEAFOOD MARKETING

In a world where fisheries regulatory structures can limit fishermen's freedom to grow and diversify their businesses at sea, many enterprising fishermen and seafood businesses are finding they can exercise greater autonomy to enhance their bottom lines on land – through seafood marketing. But marketing is not just about increasing profits: it also creates a platform for fishery participants to tell their story and enlist the public as an ally. "Locavore" marketing efforts are particularly promising, allowing fisheries participants to capitalize on public goodwill surrounding local foods and engage more deeply in the food movement.

Goal: Enable and support marketing innovations

Tactic 1. Enhance demand for underappreciated and emerging species

Marketing should focus on the species that have the most room for growth, starting with species that are underappreciated, underutilized, underrepresented, or emerging - in other words, those that are not well known by consumers, not harvested to their full allowable capacity, not as abundant in the marketplace as they are in the ecosystem, and/or increasing with ecosystem change, respectively. This priority can be advanced both through boosting market demand for specific underappreciated and emerging species as well as through broad-based messaging campaigns that advocate diversity and flexibility as routes to sustainability and resilience.

Tactic 2. Develop products that utilize every part of the fish

Reaping value from edible and non-edible fish and shellfish parts that don't typically make it to market can augment profits and reduce waste. Disposal of waste and wastewater pose challenges for many seafood processing facilities, and these companies are becoming creative about upcycling rather than disposing of this waste by turning it into consumer products. Other initiatives are focusing on utilizing parts of fish other than

DOCKSIDE SALES

Lobsters and crabs are the only species that Rhode Island fishermen can legally sell direct to consumers. Dockside sales have been a boon to lobstermen.



the fillets that consumers are most familiar with. Rhode Island and its fishing industry should continue to invest in these efforts.

Tactic 3. Bring State regulations regarding direct marketing into parity with other nearby states

Fishermen themselves are without doubt the best promoters for their products. In Rhode Island, though, a regulatory barrier divides the people who catch seafood from the people who consume it. Currently, lobsters and crabs are the only species that can legally be sold from the boat; this has helped inshore lobster boats stay in business despite their declining catches. Rhode Island should design ways to empower fishermen to sell their catch directly (straight to consumers without a middleman) without sacrificing the handling and hygiene precautions that keep our seafood safe. Modeling Rhode Island regulations on those of nearby states is a good place to start.

Tactic 4. Facilitate supply chain partnerships between fishermen, middlemen, and consumers

Partnerships between supply chain actors (e.g., co-packing, co-promotion, and shared processing space) are an alternative to direct-from-the-boat sales that can leverage resources, maximize efficiency, and open the door to new pockets of loyal consumer demand. These partnerships do not require regulatory change, but they would benefit from third-party business planning support and regulatory clarity. These innovations have low barriers to implementation and high payoff in terms of greasing the wheels of the local seafood marketing economy.

Tools: co-packaging agreements, shared kitchens and facilities, fishermen or consumer cooperatives, co-marketing campaigns



QUAHOG WEEK

In 2015, the Rhode Island Seafood Marketing Collaborative launched Rhode Island's annual Quahog Restaurant Week. The idea was sparked in collaboration with the Rhode Island Shellfishermen's Association. Taking place each year in March, its objective is to popularize quahogs at a time of year when consumer demand is low. In 2017, 38 restaurant partners participated in Quahog Week.



UPCYCLING

Point Judith seafood plants process tens of thousands of pounds of fresh squid per day, leaving a waste stream that includes squid parts and processing liquid. With limited wastewater treatment capacity in the port, one company - Sea Freeze - has developed a creative way to upcycle these leftovers by launching a new line of squid-based fertilizers for lawn, garden, and farm.

STRATEGY AREA: WORKING WATERS AND COASTLINES

Rhode Island's heavily populated coastlines and busy waters are also the workplaces of Rhode Island's fishing industry. Balancing access to fishing grounds and shore-side support activities with other user groups and societal priorities for coastal lands and waters is key to maintaining the fishing industry's ability to generate food and economic wellbeing for Rhode Island. The Rhode Island aquaculture industry finds itself affected by some of the same issues, and the two user groups – wild-harvest and aqua-farmers – should team up to address these common concerns.

Goal: Protect access to public infrastructure and seascapes for fishing activities

Tactic 1. Maintain sufficient and affordable working waterfront infrastructure

Places where fishermen keep their boats are scattered along Rhode Island's coastline. While Point Judith and Newport are owned and managed by the State of Rhode Island, other locations of commercial fishing importance are managed by towns or private owners. In many places, fishermen face steep competition for dock slips from the recreational and tourism economy. Shore-side businesses, too, face gentrification pressures, in the form of high property taxes, increased road traffic, and neighborhood hostility towards the sights, sounds, and smells associated with commercial fishing and seafood activity. Rhode Island's embrace of the food economy should include a commitment to defending commercial fishing uses of the waterfront in all Rhode Island coastal communities.

Tactic 2. Maintain and enhance public access to the shoreline for commercial fishing activities

Many of Rhode Island's small-scale commercial



MODEL FROM ANOTHER STATE

San Diego's Tuna Harbor Dockside Market is a weekly pop-up open-air fishermen's market that operates each Saturday morning. Members of the local fleet sell a variety of species to an eager public. The road to success was not easy: first, fishermen spent several years pushing for a change in state legislation that now makes it easier for fishermen along the California coast to have open-air fish markets. The effort has been worth the wait: fishermen now sell about five tons per month of diversified seafood at the market, while building connections with the local community.



JONAH CRAB

The Jonah crab resource has increased in abundance in recent years. Formerly a bycatch species in the lobster fishery that was sold for pennies at dockside, it is now a primary target for many boats. Fishermen and wholesalers have built a diverse spectrum of local and export markets for this growing species.



SCUP

The Commercial Fisheries Research Foundation and its industry partners are working to develop filleting and freezing technology that would help establish new local and institutional markets for scup - one of Rhode Island's most important species by landings, and one that is predicted to do well in warming waters.

fishermen access shoreline fishing spots on foot or launch their trailered boats at public boat ramps. Both practices can be threatened by neighborhood parking bans, landowner intrusion onto public access rights of way, and local prohibitions on commercial use of ramps. To support the role of seafood in Rhode Island's food economy, municipalities should uphold the access rights of small-scale fishermen to the shoreline.

Tactic 3. Protect the use of private property for commercial fishing storage and work

For generations, fishermen have been storing their gear and boats on the land where they live, just as farmers have lived on the land that they farm. But while Rhode Island's Right to Farm Act supports the rights of farmers to use their land in residential areas for commercial food-growing purposes (R.I. Gen. Laws §§ 2-23-1 to 2-23-7), it does not protect the right of fishermen to use their land for storage and work on boats and gear – activities that are just as critical to the work of producing food as soil and greenhouses are to farmers. Granting similar protections to fishermen would support business viability for dispersed small-scale fishing operations.

Tactic 4. Apply precaution and collaboration when permitting new ocean uses

Fishing grounds and ecosystems are increasingly viewed as an asset by industrial uses other than fishing (e.g., renewable energy, sand and gravel mining, offshore oil and gas drilling, fish farming). As these non-fishing uses accelerate in scale and frequency, fishermen and their supporters need to assure that they do not compete for space and access with traditional uses of the sea floor and water column or harm the marine life that fisheries depend on. State and Federal agencies involved in permitting and siting should make decisions that: are fair and equitable for all fishery user groups; include fishermen in decision-making processes from beginning to end; are based on a thorough scientific baseline developed in collaboration with commercial fishermen; address navigation issues; and provide compensation for any resulting intrusion onto traditional commercial fishing grounds.

STRATEGY AREA: HEALTHY HABITATS

Fishermen can be compelling advocates for the health of fishery habitats, and in Rhode Island, they are increasingly raising their voices to protect and restore these ecological assets. A healthy environment is not just a clean environment. Maximizing wild food production from the sea means not only eliminating harmful pollutants and pathogens, but also restoring watersheds, marshes, carbon and nitrogen cycles, and other ecosystem links that underpin regenerative fisheries.

Goal: Maintain a clean environment and healthy fishery ecosystem

Tactic 1. Crystallize the link between habitat and fishery food production

Habitat health is a critically neglected factor in the production of wild fish biomass and maintenance of healthy fishery ecosystems. Unfortunately, there is little that the fishery management process can do to protect and restore rivers, coastlines, coastal wetlands, benthic habitats, and water quality, all of which lie outside the jurisdiction of fisheries agencies. There is, however, much that other State and Federal decision making arenas can do. Rhode Island fishermen should build bridges to these other public policy arenas and make the case for restoring fisheries habitat for food production.

Tactic 2. Address cumulative stressors

Habitat stressors occur at many scales. Cumulative effects can be multiplicative, unpredictable, and hard to bounce back from. The occurrence of climate change at the global scale makes it all the more urgent to address habitat stressors at the local scale by doubling down on efforts to preserve shorelines, reduce toxic inputs to water bodies, and gain a better understanding of the impacts of human activities such as wastewater disposal.

Tactic 3. Ramp up monitoring of ecosystem change in Narragansett Bay

Fishermen have observed some unsettling patterns in Narragansett Bay: a decline in rockweed, kelp, barnacles, starfish, sea squirts, and other



STATE MANAGEMENT

The port of Galilee is owned and managed by the R.I. Department of Environmental Management (DEM), which has long affirmed a port goal of economic development through fisheries. In addition to providing affordable berths, DEM makes sure that fishermen have space to store nets and traps, and that the industry is safe from the kind of gentrification pressures that have made it one of New England's last remaining full-service fishing ports. Unfortunately, fishermen in other parts of coastal Rhode Island do not share the same level of security.

invertebrates, and an increase in water clarity and nuisance seaweed. While the causes of these changes are not known, some fishermen hypothesize a connection to recent renovations to Rhode Island's wastewater infrastructure that have helped achieve a 50% reduction in the nitrogen entering the bay. This suite of changes is a high priority for future research and action.

Tactic 4. Strengthen the role of fishermen as environmental sentinels and advocates

Fishermen spend much of their lives in the marine environment, and their success depends on deciphering the signals of that environment. Consequently, when the ecosystem changes, they are often the first to notice. In a fast-changing world, this role can be indispensable. It can be nurtured by developing credible, systematic ways for fishermen to synthesize and share their observations

with the scientific community, recruiting fishermen to participate in science-based monitoring, and involving fishermen in advisory roles on environmental collaboratives and steering committees.

STRATEGY AREA: ADAPTIVE SCIENCE AND MANAGEMENT

In natural resources studies, fisheries are known as a "coupled socio-ecological system." This framework is useful for supporting fisheries resilience in a changing and variable climate. As the ecological side of the fisheries system continues to change, the human side must become equally supple if it is to thrive. That is not currently the case. Although fishermen themselves are highly nimble - able to read the cues of the environment and respond accordingly - the systems that govern science and management of fisheries are rigid and sluggish by comparison.



HARBOR MANAGEMENT PLANS

Several Rhode Island coastal towns, including Bristol, Jamestown, and Wickford, have harbor management plans that provide official protection to commercial fishing uses. For example, Bristol's plan declares, "It is important that commercial fishermen in Bristol have sufficient resources such as good water quality, dock space, boat launches, and parking in order that this industry survive." Bristol's commitment it also demonstrated through the recent renovation of a Bristol Maritime Center and in Bristol's annual Harbor Fest, seen here.



MODEL FROM ANOTHER STATE

The United Fishermen of Alaska's Salmon Habitat Information Program is a platform to get the word out to fishermen about issues and opportunities related to salmon habitat. Through email updates, presentations, and newsletters placed in strategic locations where fishermen go, the program engages fishermen in becoming advocates for pro-salmon policies that ensure commercial fishing jobs remain strong for generations.

Adapting fisheries to climate change and variability can't be achieved through individuals' personal actions or through one-time management measures produced through the process as it currently stands. The system itself must change in fundamental ways. This is primarily a task for regional and interstate fisheries management bodies such as the New England Fishery Management Council, the Mid-Atlantic Fishery Management Council, and the Atlantic States Marine Fisheries Commission, as well as the Federal elected officials who authorize these bodies' work and the State and Federal scientists whose research supports it.

Goal: Make fisheries science and management as dynamic as the ecosystem

Tactic 1. Reduce time lags between data collection and management action

Fisheries managers strive to be as accurate as possible. As a result, the time that elapses between initial data collection and implementation of management actions can be quite long. Ironically, the slow pace of this process can sometimes add to uncertainty rather than reducing it. To keep up with changing temperatures and predator-prey dynamics, the science-management process needs to become more expedient, without sacrificing other things that matter, such as public input. An appropriate balance needs to be drawn between certainty of scientific advice and the timeliness of its delivery.

Tactic 2. Incorporate climate into stock assessment models

The basic models of fisheries management treat fishing and natural mortality as the only factors that affect the harvestable volume of fish stocks.

These models would be more realistic if they also incorporated relevant direct and indirect effects of temperature, pH, salinity, and other environmental variables on fish populations and ecosystems. Scientists and managers should consider climate and temperature when interpreting the size of the stock and making decisions about allowable catches. They should also consider spatial distribution trends of the stock when making decisions about access, allocation, and jurisdiction.

Tactic 3. Manage fisheries, food webs, and habitats as a system

Managing individual pieces of the ecosystem as if they were independent of one another is unrealistic. Ecosystems are complex, hard-to-predict systems of many interacting parts, and fisheries management should reflect this. Fisheries management should embrace an ecosystem-based approach to fisheries – one that is adaptive and

bottom-up, rather than relying on top-down approaches that are resource-intensive, overly data-reliant, and time-consuming. Fisheries and fisheries management should focus on designing human systems that are able to thrive in many different ecosystem configurations, rather than adopting the impossible task of controlling ecosystems to suit predetermined human needs.

Tactic 4. Promote policies that facilitate business-level diversification

The ability to participate in multiple fisheries and to switch species as new opportunities become available is a linchpin of resilience in a changing climate. Fisheries managers should consider the degree to which future regulatory changes inhibit the ability of fishermen to diversify, and should seek regulatory changes that enhance the ability of fishermen to diversify wherever it is feasible and advantageous to the greater good.

**BLACK SEA BASS
RESEARCH FLEET**

The Commercial Fisheries Research Foundation's Black Sea Bass Research Fleet employs eight Rhode Island commercial and recreational fishermen, utilizing a variety of gear types, to collect biological and fishery data on black sea bass throughout the year. Data is communicated to scientists at the R.I. Department of Environmental Management to enhance understanding and improve the stock assessment for black sea bass - a species whose distribution and abundance in Southern New England is expanding rapidly as waters become warmer.



Tactic 5. Secure Rhode Island a voting seat on the Mid-Atlantic Fishery Management Council (MAFMC)

Since the MAFMC manages most of the migratory species that Rhode Island fishermen have come to depend on during the last few decades – a trend that will continue as long as waters continue to warm – Congress should reassess the makeup of the regional Fishery Management Councils and assign a voting seat to Rhode Island on the MAFMC.

Tactic 6. Regularly update history-based landings allocations

History-based landings allocations like those that exist for many migratory Mid-Atlantic species can get in the way of adapting to climate change if they create scenarios where fishermen cannot

keep what they are catching, despite large bio-masses in their area. New rules that update state-wise allocations from time to time can help keep allocations current and prevent needless waste and undesired food web interactions.



ADVOCATING FOR NARRAGANSETT BAY

Fishermen are building bridges with the science and monitoring communities to share concerns about recent changes in the Narragansett Bay ecosystem and to press for understanding of the role of local anthropogenic stressors (such as wastewater disposal and treatment) in driving these changes. Fishermen's outreach efforts resulted in a decision by the University of Rhode Island Graduate School of Oceanography and Rhode Island Sea Grant to make Narragansett Bay the focus of the 16th Annual Ronald C. Baird Sea Grant Science Symposium in December 2017. The event, titled "Narragansett Bay: A Conversation Among Citizens and Scientists" began with three commercial fishermen sharing their observations and concerns.

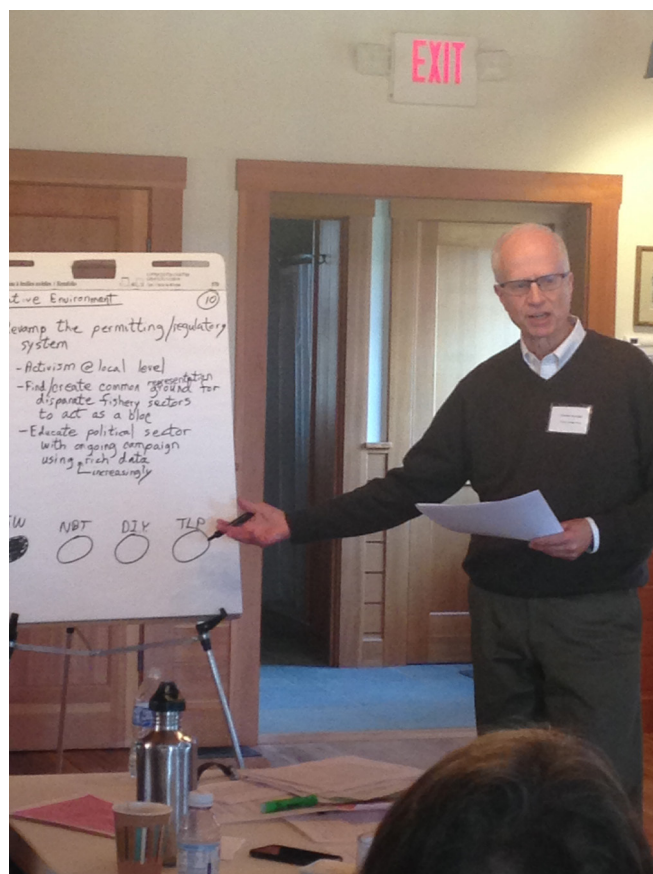
IMPLEMENTATION AND NEXT STEPS

The process that led to creation of the *Blueprint for Resilience* was decentralized and bottom-up. Implementation of its strategies will be equally distributed, borne on the shoulders of all who recognize the importance of wild-harvest fisheries to the state of Rhode Island. Individual industry participants, industry associations, educators, nonprofit organizations, elected officials, State and Federal government agencies, municipalities, scientists, investors, and funders are all invited to implement and build on the strategies recommended in the *Blueprint for Resilience*.

The Resilient Fisheries RI communications platform that provided the springboard for the *Blueprint for Resilience* will remain in place after publication of the *Blueprint*. Members of the fishing industry and their partners are invited to utilize it to advance *Blueprint* strategies. The platform's tools include the www.ResilientFisheriesRI.org website, the Resilient Fisheries RI List-Serv, and a culture

of collaboration and transparency associated with the Resilient Fisheries RI experience. Guidance on using these resources is available on the Resilient Fisheries RI website to facilitate autonomous implementation of the *Blueprint's* strategies by fishing industry participants.

The Resilient Fisheries RI planning process generated seven clear strategy areas that are key to a vibrant future for Rhode Island fisheries. Follow-up work plans will be developed as new issue entrepreneurs come to the fore and take the initiative to create them. All fishing industry participants are invited to implement sections of this strategy. Working groups focused on each of the seven strategies will be formed as a way to deepen understanding of the issues and drive collaborative problem solving. Guidance on how to use the Resilient Fisheries RI model to promote engagement, transparency, and industry-based vetting for these and other issues is available at www.resilientfisheriesRI.org.



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Photographs

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Page 13: Tim Rakovan (Sarah Schumann), Dave Blaney (Sarah Schumann), Aaron Gewirtz (Sarah Schumann)

Page 14: Jerry Carvalho (Mike Cevoli), Derek Pascale (Jack Moore)

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Page 16: Greg Mataronas (Commercial Fisheries Research Foundation)

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Page 24: Virginia Watermen's Heritage Tours (Paula Jasinski), Resilient Fisheries RI scenarios process (Sarah Schumann)

Page 26: Commercial Fishermen's Apprenticeship Program (Mitch Hatzipetro), shellfishermen's internship how-to video (Bruce Eastman), Alaska Young Fishermen's Network (Noah Sunflower)

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Page 33: Bristol Harbor Fest (Mark Bettencourt), Salmon Habitat Information Program social media post (United Fishermen of Alaska)

Page 34: Black sea bass research fleet (Commercial Fisheries Research Foundation)

Page 35: Fishermen's panel at the 2017 Baird Symposium (Veronica Berounsky)

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Back cover: F/V Linda Marie (Jay Swoboda)

Endnotes

1 Rhode Island Agricultural Partnership. 2011. *A Vision for Rhode Island Agriculture: Five Year Plan*. Available at: http://www.dem.ri.gov/programs/agriculture/documents/RI_agriculture_5yr_strategicplan.pdf

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7 These estimates are based on 2008 economic trends and have not been updated.

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