MASSACHUSETTS FISHERMEN'S PARTNERSHIP

COMMERCIAL FISHERIES CENTER OF RHODE ISLAND

December 28, 2021

To: **Dr. Rick Spinrad**
Administrator, NOAA
1401 Constitution Ave NW
Washington, DC 20230

Re: **Synthesis of the Views of 20 Southern New England Commercial Fishermen on NOAA's Role in the America the Beautiful Initiative**

Dear Dr. Spinrad,

The Massachusetts Fishermen's Partnership (MFP) and Commercial Fisheries Center of Rhode Island (CFCRI) are pleased to engage with your agency regarding the America the Beautiful initiative established under President Biden's Executive Order 14008 on Tackling the Climate Crisis at Home and Abroad.

Healthy habitat is the very foundation of prosperity for America's fishermen. But for far too long, non-fishing impacts to habitat have been a major blind spot in fisheries conservation and management. Today, as our lands and oceans face greater development pressure than ever before, it is imperative to address this gap.

In the Northeast, critical inshore and estuarine habitats continue to be affected by runoff and wastewater effluent, while offshore, an unprecedented buildup of wind energy projects presages ecological change on a scale unseen before. Meanwhile, here and across the globe, warming waters are reconfiguring marine ecosystems, spatial distributions, and seasonal patterns in profound ways. Even seemingly distant impacts can be felt at home: for New England fishermen who travel seasonally to fish in Bristol Bay, Alaska, the threat of hard rock mining hangs overhead until permanent protections are put in place to protect this precious ecosystem.

Fishermen view ourselves as caretakers of the ocean. We stand to lose the most when habitats are degraded, and we are the first to notice when ecosystems change. But we are rarely the first to be listened to, when we bring these observations to the attention of scientists and policy makers. If the ambitions of America the Beautiful are to be met, this historical pattern must change.

The "Conserving and Restoring America the Beautiful" report published earlier this year commits NOAA and other federal agencies to pursuing a collaborative and inclusive approach to

conservation and to supporting locally led and locally designed conservation efforts. We strongly applaud these commitments and stand at the ready to match them with a commitment of our own, to contribute local ecological knowledge and contextual understandings to help develop sound and innovative conservation approaches that support our fisheries.

In keeping with this commitment, MFP and CFCRI have jointly undertaken a canvass of our organizations' boards of directors and our two states' fishing industries to identify key fishery habitat conservation priorities. Along with this letter, we submit the following:

- A synthesis of interviews conducted with 9 Massachusetts and 11 Rhode Island fishermen in December 2021 by Shining Sea Fisheries Consulting and the staff of CFCRI, to gather input on fish habitat and NOAA's role in conserving it; and
- A set of policy recommendations developed by Homarus Strategies based on these interviews, detailing ways that NOAA and other agencies can address industry concerns about fish habitat conservation in alignment with implementation of the America the Beautiful initiative.

The material contained in this attachment does not necessarily represent the organizational views of MFP and CFCRI, as time precluded us from submitting them to a full internal review. Rather, the interview synthesis and policy recommendations contained here represent the collective knowledge and views of 20 highly knowledgeable and respected members of our two states' fishing industries, and the policy synthesis represents our commitment to thinking broadly and proactively with industry and outside experts to translate these ideas into viable and collaborative action. Over time, we hope to build on this initial effort to deepen the engagement of Southern New England fishermen in the America the Beautiful initiative, whose perspectives and involvement in these efforts are critical to their effectiveness in our region and, perhaps, the nation.

Thank you for the opportunity to comment and for your consideration.

Sincerely,

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ENCLOSURE

ENCLOSURE: **Synthesis of the Views of 20 Southern New England Commercial Fishermen on NOAA's Role in the America the Beautiful Initiative, with Policy Recommendations**

This report was prepared by Shining Sea Fisheries Consulting, LLC and Homarus Strategies, LLC for the Massachusetts Fishermen's Partnership and the Commercial Fisheries Center of Rhode Island.

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Introduction

This synthesis of the views of 20 Southern New England commercial fishermen is submitted to NOAA in response to its "Request for Information on NOAA Actions To Advance the Goals and Recommendations in the Report on Conserving and Restoring America The Beautiful, Including Conserving At Least 30 Percent of U.S. Lands and Waters By 2030" (86 FR 59996), issued on October 29, 2021.

The synthesis was developed from individual phone interviews with 20 participants in the Rhode Island and Massachusetts fishing industries. Participants included inshore and offshore fishermen utilizing a variety of gear types and targeting a number of different federal and state-waters fisheries. They included leaders and members of various fishermen's associations, and many were board members of the two associations that commissioned this work.

The purpose of this synthesis was to gather accounts from highly experienced fisheries participants about: previous experiences with area-based conservation and lessons learned from those experiences; observations of ecological change in Southern New England and the Gulf of Maine; concerns about impacts and stressors to fishery habitats; priority areas for

conservation; and recommendations for an effective and collaborative implementation of America the Beautiful.

The aggregated interview comments represented in this synthesis answer the following questions outlined in the NOAA's "Request for Information":

- What criteria NOAA should consider in working with other agencies to identify existing or potential new "conserved" or "restored" areas for the purpose of advancing the goals and recommendations in the Report.
- What additional scientific information, Indigenous Knowledge, or other expertise NOAA should consider in order to advance the goals and recommendations in the Report.
- How NOAA should consider tracking its actions and measuring its progress, including with partners, toward advancing the goals and recommendations in the Report.
- What actions NOAA should consider taking to support non-Federal entities, including tribal, state, territorial, and local governments and non-governmental organizations and other private entities, to advance their efforts to conserve and restore U.S. lands and waters.
- What actions NOAA should consider taking to facilitate broad participation in the America the Beautiful initiative.
- What additional information NOAA should consider as relevant to its role in implementing the America the Beautiful initiative.

The synthesis of our interviews is complemented with brief policy recommendations at the end of each section. These recommendations are reflective of and responsive to the issues and topics highlighted in the interviews, and are intended to achieve the conservation principles, goals, and objectives identified by our project participants. These recommendations respond to the following questions outlined in the NOAA's "Request for Information":

- Which of NOAA's existing authorities and associated measures, as listed above, are most appropriate for addressing the threats identified in the Report, which are the disappearance of nature, climate change, and inequitable access to the outdoors.
- Whether NOAA should better apply its existing authorities and associated measures, as listed above, to advance the goals and recommendations in the Report.

Finding 1. Healthy habitats are vital to the prosperity of fishing businesses and to our nation's food system.

In "Conserving and Restoring America the Beautiful," NOAA and its partner agencies declare a commitment to "pursue conservation and restoration approaches that create jobs and support healthy communities" (Principle 5). Based on the comments reviewed in the sections below, this synthesis suggests that maintaining *existing* natural resource-dependent jobs such as fishing, which has co-existed with nature for hundreds of years, should also be a priority focal point for further conservation.

The value of healthy habitats to the success of southern New England's fishing businesses cannot be overstated.

All participants interviewed for this effort concurred that habitat is the foundation of life in the ocean and plays a fundamental – if often overlooked – role in the success of fishing businesses.

"Healthy fish habitat is one of the pillars of productivity," explained one participant. "Systemic productivity is what gives rise to a healthy fishery. It's all connected. We are just another critter in the food chain. We are ultimately dependent on a healthy environment."

"My business is pretty much built around fish habitat," said another participant. "If the fish move from the habitat that they're in, for some reason, then I don't make money, because they're not there anymore. Basically, my entire business is built around fish habitat."

"It's the engine that makes the car go," said another participant. "You need these rookeries or nurseries or whatever you want to call them, that really create what the fishermen and what people can enjoy as far as the resource. It's really critical. It's ground zero as far as keeping the habitat correct and clean. And if you don't have the habitat, you don't have the fish."

"It's kind of obvious, right?" said another participant. "If the fish have a healthy place to live and go through their lifecycle, then we benefit from having access to healthy resources that we depend on."

Getting into greater specifics, participants offered up the following definitions of "healthy fishery habitat":

- "Healthy fishery habitat would be an abundance of fish. A place where fish aggregate, from the bait fish on up to the predators, right through the whole food chain. That would be healthy habitat."
- "Healthy habitat is that the same area has produced fish repetitively, year after year after year."
- "Having a healthy fish habitat allows [fish] to be productive, allows the food chain to flourish. Without a healthy habitat, you really don't have a good base ecosystem for our species to survive and reproduce and go about their daily lives. Their goal is to survive, eat, and reproduce. It's pretty basic."
- "It's a habitat or area of the ocean floor that fish can come back to, year after year, to spawn and to feed. It's not something that's being wiped out so when they come back, there's nothing there and they have to go off somewhere else. Also, it's an area that has everything it needs -- realizing that they might spawn over here and then feed over here -- but it has what they need at that particular time. A food source. Maybe for some species, like lobster, it's places to hide. Places to grow their eggs, or to attach their eggs to. Just places where a species or two or three or whatever are allowed to thrive."
- "Healthy fish habitat is everything. You got to have a healthy habitat to have a healthy resource to have a healthy fishery."
- "When I define it, I guess it would be something along the lines of some type of balance. What we're putting in and what we're taking out of the water."

- “When I think of healthy habitat, I think of mostly structure. And I guess now, more and more, I learn about the water itself. Like the temperature of the water… I think water and water quality is more in my head, also, about healthy habitat."
- “Healthy fish habitat should be structurally consistent with the maker’s plan. It should look like it did before we got here. It should not be encumbered with debris or garbage. It should have a wide range of diversity, anywhere from the benthic community all the way up through alpha predators."

Policy recommendations:

- Develop and implement programs designed to enhance fishing community members’ participation in and awareness of habitat conservation programs
    - Leverage Sea Grant cooperative extension programs to regularly solicit stakeholder input on specific America the Beautiful conservation priorities and actions
    - Provide support for projects that create and enhance community/stakeholder engagement with regulatory processes and that enhance capacity for young fishermen to learn and engage
    - Solicit the input of fishermen’s associations and organizations like the Atlantic Coastal Fish Habitat Partnership during the development of America the Beautiful conservation programs and priorities
- Create fisheries productivity, ecosystem services, and climate mitigation metrics for fish habitat areas
    - Work with the Northeast Regional Marine Fish Habitat Assessment to establish specific metrics and to identify specific threats to marine habitat that can be addressed with specific, targeted, and adaptive governance solutions

More can and should be done to take care of fishery habitat.

Despite its clear importance, many participants felt that the role of healthy habitats in supporting fishery ecosystems is insufficiently addressed in fisheries governance. By and large, participants would like to see more done to protect fish habitat from non-fishing impacts, both inshore and offshore.

“I think we sort of take [fish habitat] for granted,” said one participant.

“The ocean should need to be protected,” stated another participant. “Because we are producing food. And we are seeing the shortage of food through this pandemic… We need to keep the ocean clean, because of the delicate habitat that is in the Northwest Atlantic, and what that ocean is capable of providing to feed the people of this country and around the world. It should not be tampered with in any way, shape, or form.”

“I don't think we've done a very good job,” said another participant. “The hand of man has touched everything. We find presence of human occupation playing out in 100 fathoms of water. We have gill nets that are down and we have lobster traps that are down [there]. We have, looming over our head, the development of wind farms. We have so many things. I don't

think we have taken time to understand all the consequences of our existence. I don't think we have gone far enough to focus on water quality."

Policy recommendations:

- Work with GARFO and with NOAA sister agencies to establish policies encouraging and/or requiring agencies to adopt EFH Conservation Recommendations from NOAA EFH consultations
- Expand stakeholder awareness of NOAA EFH consultations and EFH conservation recommendations through messaging and via enhanced visibility at the New England Fishery Management Council
- Provide encouragement and fiscal support for the New England Fishery Management Council to prioritize EFH reviews at the appropriate cycles

Finding 2. Fishery habitats face a growing number of stressors and future threats.

When asked about stressors and threats projected to affect fisheries habitat between now and 2030, participants mentioned the following:

- Offshore wind development (15 participants)
- Wastewater and wastewater treatment (9 participants)
- Coastal development and gentrification (9 participants)
- Nuclear waste from the Pilgrim Nuclear Station (2 participants)
- Mining and aggregate extraction (2 participants)
- Ballast water (1 participant)
- Ocean plastic (1 participant)

Participants also reflected on the impacts of fishing gear to fishery habitat – some negative, some positive – and expressed commitments to ensuring that fishing itself does not damage the areas that fishery resources rely on for spawning and survival.

Offshore wind development

Most participants named offshore wind as the most pressing concern facing fishery habitat. By and large, it is the uncertainty surrounding the impacts of wind farm development that scares them the most – and the fact that the U.S. is now hurtling towards rapid buildout of dozens of wind farms before anything approaching thorough research into the impacts can possibly be done.

"With 1,450 square miles of pending wind farms, I am very concerned," said one participant. "I don't know enough about the consequences. I don't think the developers have been forthcoming with their experiences in other places. I don't think there has been enough of a scientific pursuit to pave the way to a successful implementation… A hurried implementation is equally frightening. And the cumulative effects might not be known for decades."

“Looking ahead, there's always the big concern about the wind farms, and what kind of effect that's going to have on the habitat,” said another participant. “That's a big question mark. Nobody knows what that's going to do.”

“There are so many unknowns,” said another. “The dirtiest word a fisherman can hear from a scientist is 'uncertainty'. And now we have a higher degree of uncertainty, because now we're going to be putting up hundreds and hundreds of turbines in the ocean… Human nature, we love to build things and deal with the consequences later.”

“We're talking about basically industrializing the ocean,” said another participant. “You know in school, in your history class, you see the pictures of the Industrial Revolution, just smokestacks of coal? I feel like that's what we're doing to our oceans by plopping these things in. That has tremendous potential to negatively affect our ocean environment. I mean, there's just a million ways. And the biggest problem is, it's all being rushed with mostly unknowns. I just don't understand how it could be pushed through as environmentally friendly, but there's no information on what it's going to do to the most pristine environment we have left."

"The wind stuff, I think it's an overall ecosystem impact,” said another participant. “It's going to impact the habitat itself. It's going to impact forage fish. It's going to impact demersal species, lobsters and crustaceans and squids. I think everything is going to be put into a tizzy. I don't know what the ultimate outcome is going to be. But I fear it's going to be bad. “

In addition to general concerns about uncertainty, participants described the following specific concerns related to impacts of offshore wind development on fisheries:

- Electromagnetic fields: “You got to have these ginormous power cables strung across the bottom of the ocean… We don't know what effects all that electricity running through the waters is going to have on the fish stocks, from the lobsters, the crabs, the groundfish, the tuna, the whales, the sea lions, the seals. You have all that power surging through there. We won't know the effects immediately… You're going to have hundreds of miles of cable, if not thousands of miles of cable, strung across the ocean floor. And they're not going to be far from each other, so whatever energy field's coming off on one, it's going to overlap with the next one. It's going to completely change the fish migration patterns, their spawning patterns. Everything's going to change.”
- Impacts to migration and spawning: “These cables are going to have to touch shore. My greatest concern with the wind development and the structures that are going to be out there is: what's it going to do to migration? What's it going to do to spawning? Not just the structures, but the wire and the current going through the wires coming to shore and the construction that's going to be in the near shore to support these structures. There's a lot that's going to be happening real fast.”
- Thermal pollution: “They are proposing a cooling facility, to cool the wires, I guess… It was going to be discharging 90-degree water from this facility, which was going to be a few miles offshore. Now, the Gulf of Maine is warming faster than any ocean around, and we're going to be discharging 90-degree water, at I think it was a million gallons an hour or something like that?... How much larvae are you going to be sucking into that? It's just things like that we need to be aware of."

- Impacts on migration: "For the offshore wind, it would be the migratory species that have to move through wherever it is that these wind farms are. They're going to have to move through that area. Nobody knows exactly how all that energy that they're putting in the ocean is going to affect the migration of these fish as they have to move from offshore to inshore through all that. That's a big concern."
- Acoustic impacts: “Everybody knows how sound travels very far on the water. So there's going to be multiple vibrations coming into play. I think you're going to need some studying to understand, but I would definitely think it's going to affect a lot of fish. A lot of types of fish around the windmills. Because there's just so many different frequencies that are on the water.”
- Trophic impacts: “I think [it's going to be a very different] ecosystem out there. When you think alone about building structure. We all talk about the number one structure-loving animal. It's black sea bass. I know some people are so excited about it, and rightfully so. They throw their pots down if they're allowed to, and there they go. But some of us are worried about it, because when you bring in a huge swath of species, what does it do to the rest of us? It upends the food chain. And is that healthy? Is it not?... Even if you are a sea bass fisherman, is it healthy for one species just to come in and usurp the rest?”

Several participants praised the work that NOAA is doing to understand the projected impacts of offshore wind development and to raise concerns with the Bureau of Ocean Energy Management (BOEM) about possible impacts to ecosystems, fisheries, and NOAA trawl surveys. However, these participants also expressed frustration with BOEM’s apparent disregard for these concerns. Several shared a view that offshore wind development decisions are being driven by politics rather than sound science. “It's a political issue,” said one participant. “And it should not be a political issue.”

Policy recommendations:

- Work with GARFO and BOEM to develop robust and well-publicized EFH conservation recommendations for proposed OSW projects, and encourage their incorporation into preferred alternatives for project design and construction wherever possible
- Work with colleagues at the Department of the Interior and wherever appropriate to abandon the procedurally flawed “Smart from the Start” OSW permitting posture, and replace with a process that fully evaluates environmental and fishing community/business impacts of offshore energy development prior to leasing
- Fully investigate the impacts of EMF, acoustic energy emissions, and other physical disturbances associated with the siting and construction of OSW facilities to fisheries, fish habitat, and the environment, and approaches that incorporate stakeholder knowledge, as an immediate research priority
    - To date, resources provided for the development of this critical area of research are woefully inadequate; approaches that incorporate stakeholder knowledge have not been prioritized
- Develop communications strategies designed to circulate and publicize NOAA’s work to ensure that fish habitat conservation is a core component of the agency’s engagement in the OSW planning and permitting processes

Sewage and wastewater treatment

Nine participants described concerns over the impacts of wastewater and treated effluent on inshore and estuarine ecosystems. These comments focused on multiple aspects of wastewater effluent, including the composition of the waste itself as well as the effects of the chemical processes used to treat it. Taken together, they illustrate the complexity of this issue and the need for further investigation of wastewater impacts in collaboration with the fishing community.

Five participants expressed concerns about the impacts of chlorine-laden effluent on estuarine ecosystems. “They say the chlorine killed all the plankton up in the bay,” said one participant. “A lot of those fish, that's what they depend on. I think that's had a lot to do with it. It's made it undesirable for the fish to go to these certain places that they always did.”

One participant praised his local wastewater treatment plant for “not using chlorine. Our town just shifted over to ultraviolet light, which I think is working. I'm not quite sure. I'm not up on it. But anyway, they're innovating on sewage plant treatment.”

Another participant expressed concern about pharmaceutical substances in wastewater: “When the other part of that is, you're also putting pharmaceuticals. No matter what you do, you're introducing pharmaceuticals. You're introducing birth control. Antibiotics. Everything that everyone's putting in their body and coming out of their body is coming out. What effect is that [having]?"

Three participants discussed changes in the Massachusetts Bay ecosystem that occurred after the extension of the Massachusetts Water Resources Authority (MWRA) pipe from the Deer Island wastewater treatment facility (WWTF) and addition of tertiary treatment in the 1990s. One said that the area around the outfall had been “sterilized” by addition of effluent, but that the area has recovered since.

Another participant stated, “The MWRA pipe puts out 600 million gallons a day of fresh, warm water, into what they say is one of the most important cod spawning habitats. When they talk about climate change, well, what causes acidification of water? Freshwater… You’re not going to shut off the MWRA pipe. That's not going to happen. But the very least you can do is recognize that it's an impediment to what you think you have as a goal for rebuilding fish stocks… They used to take out four tractor trailer loads of blackbacks a day out of the fleet that tied up in Plymouth. The last time we went in there, there might have been like three or four of us, and I don't think we had 600 pounds between us. It was all skates… Why would that happen? What I feel is happening is that you have a river of fresh water... So, are you asking the fishing community to do Mission Impossible?... The effects of outfall pipes, nitrogen, different things, you're not going to change that right now. It's just not going to be the same, so you can't be trying to rebuild to something that’s never going to happen again. You're in a fool's errand at that point."

Expressing a contrasting view, another participant called the MWRA pipe extension and upgrade a “huge, huge accomplishment. It made the world a lot better than it was. The previous setup, where they were discharging partially treated sewage directly into Boston Harbor, basically killed the life of Boston Harbor. There was nothing left. It was because not so much the sewage but the chlorine that they were adding to the sewage to kill the bacteria also killed everything in the ocean.… I don't think it [is] really badly degraded by the material that they [are] dumping out [now], because it was secondary treated sewage versus partially treated sewage, and they had shifted over from using chlorine to oxygen as a disinfectant rather than chlorine."

Two participants mentioned untreated sewage emanating from combined sewer overflows (CSOs) and leaky cesspools and septic tanks. One mentioned the rain closures that occur in inshore shellfishing grounds after rain events in areas where CSOs are common.

Two participants discussed changes in nitrogen loading to Narragansett Bay as a result of managed nitrogen reductions at the Narragansett Bay Commission’s (NBC) Fields Point WWTF. Wastewater treatment upgrades have been associated with a dramatic increase in water clarity and bacterial contamination. However, in recent years, many fishermen have also expressed concern that nitrogen reductions have limited the food source available to support primary production and higher trophic levels in the bay.

“Currently, I think that we are taking too much nitrogen, with the water treatment plants, out of Narragansett Bay, which feeds a heck of a lot of places,” said one participant. “I truly believe that we are out of balance there. The water is just so clean, it's ridiculous. I almost think that some of our oysters are starving -- not starving to death, but they're not growing as fast as they could, because they got enough food to survive, but not enough to thrive… I think it has to do with the amount of nutrients, supplements, or whatever the $3 words are for that. Just for the entire cycle of how it works."

Expressing a contrasting view, another participant said, “Hopefully the clear water will mean greater access for us, and the negatives, that there's less nitrogen going down Bay, is made up by the fact that we get more access to farther up the bay, and that's a healthier resource now.” Thanks to the wastewater upgrades, in 2021, shellfishermen were granted access to the Providence River portion of Narragansett Bay for the first time in many decades, and found that the shellfish resource in the area was robust and healthy, with a variety of year classes represented. This participant continued, “The river has suddenly become productive, because of the changing nitrogen level there… This is like a seven-year set that we're seeing, from big necks to the little ones. I guess we're seeing the negative effects in other parts of the bay, because of the restriction of the food [or] nitrogen in the water, but maybe this area, and even further north, are becoming productive now. That would be a great thing, a positive thing, for the fishermen… We were only seeing the negative change up until this summer [but] this is a positive thing that we're seeing [now]. It's more access, and an environment that allows the shellfish to set and not die from the low oxygen or the various things.”

The presence of contrasting views on the ecological impacts to inshore fishery habitat from two of Southern New England largest investments in wastewater treatment (the NBC’s Fields Point

WWTF and the MWRA's Deer Island WWTF) highlights an important need for further dialogue, research, and planning.

Policy recommendations:

- Develop EFH consultation criteria for agencies consulting with GARFO on projects that may adversely impact EFH using a similar framework to GARFO's ESA Section 7 Technical Guidance
    - Fully develop guidelines for local and state agencies to address proposed projects' impacts to water quality and those impacts to EFH, including impacts to the marine environment and to the productivity of managed species
- Work with local and state NEPA lead agencies to develop wastewater treatment and other project alternatives that eliminate the discharge of pollutants that harm fisheries or EFH

Coastal development and gentrification

Nine participants focused on the impacts of unchecked coastal development on inshore and estuarine habitats. In many cases, these impacts are tied to gentrification of the shoreline and increasing use of coastal areas by the tourism industry.

"Years ago, even in Galilee, the fishermen lived there. The rich people didn't want any part of it," said one participant. "Now that's totally turned around. A fisherman can't afford to. The rich people have taken over all that land around the water, places which weren't built on before. That's definitely, with all the septic systems, affected things. I always said the fish go where there's food and where they're comfortable. If they're not comfortable - and they breathe the water like we breathe air. We don't want to live in places like Los Angeles, with that smog, and fish don't want to live in a place where the water isn't to their liking."

"Everything starts on the shore," said another participant. "Nantucket is full of places that are like $25 million estates now, that clear-cut everything right down to the water and put in grass, fertilize it. No one seems to stop that… I mean, let's face it, the Cape is nothing but a sandpit. Everything filters down and out through there. Are there things they should be doing for the health of Cape Cod and Nantucket Sound, in regards to real estate development?"

"There have been a few developments, not right on the water, but in marshy areas," said another participant, based in Gloucester. "You just don't know what kind of effect it's going to have, if any, but it's still concerning. Anything that is documented to be a coastal fish habitat should be protected as much as we possibly can. That should go without saying. NOAA should be out in front or anything like that, that's a known fish habitat."

Specifically, participants referred to lawn chemicals and fertilizers, runoff from roads, thermal pollution, and light pollution as stressors of concern:

- Chemical runoff: "The only thing that might be preventing [fish habitat] from being more healthy, at this point, would probably be the possibility of the problems with runoff from all these chemical treatments that are being used. I'm sure that has some sort of effect.

Lawns, streets, whatever they're putting on the streets. It ends up in the estuaries, in the bays. I'm sure that has some sort of a negative effect on our habitat and the fishery."

- Thermal pollution: “A thunderstorm can put hundreds of thousands of gallons of water across 120-degree tar. We shock the water with a spike in temperature. There are a number of forms of pollution we really need to start looking at.”
- Light pollution: “As the shore gets developed, it gets lighter. There's more light shining into the water, and all these LED lights or whatever they call them, are super bright. I don't know if that impacts fish. Maybe they don't want to come close to the land because it's lighter than it used to be. When the coast was dark, they'd go in there and they'd hunt and do whatever they had to do. But now it's too light. I don't know if that's true or not but it must affect something. Like if you had a big waterfront hotel that's shining lights onto the beach so people can go walking on the beach at night and play volleyball and all that, if that draws in all of these small larvae or creatures of some sort, so now they're easier for the game fish to find and they wipe them out, is that an impact on the success of that spawn for that species? Maybe."

Policy recommendations:

- Work with EPA to develop research programs to investigate the impacts of regulated and unregulated chemicals to fisheries and the marine environment
    - Develop inter-agency processes for rapid response to the discovery of putatively harmful chemicals, enabling the revocation of FONSI and GRAS determinations when chemicals are found to be likely to be harmful to fisheries and the marine environment
- Work with CZMA agencies at the various states to develop more robust cooperative efforts to reduce harm from coastal development and water quality impacts to the marine environment and fisheries resources
- Recognize that commercial fishing communities’ access to the nation’s coasts and the availability of working waterfront is consistent with the America the Beautiful Report’s recognition that loss of access is a fundamental threat
    - Assist the New England Fishery Management Council with implementing MSA National Standard 8 to conserve economically critical working waterfront areas, in order to provide and maintain access to increasingly vulnerable fishing and coastal-dependent communities
    - Work with municipal and state governments to recognize the inherent cultural and economic value of working waterfront areas as well as the irreversible impacts losses of working waterfront areas has to marginalized coastal-dependent communities

Dumping of radioactive water into Cape Cod Bay

Two participants expressed concern about a recent announcement that the decommissioned Pilgrim Nuclear Station was seeking to dump radioactive water into Cape Cod Bay.

“We just found this out the other day,” recounted one participant. “I think it's a million, or maybe it's 10 million, whatever, gallons of water, which is around the rods to cool the rods. They

want to dump it in the bay… Unfortunately, from what little I know about it, they don't really have a plan, or there's no rules or regulations for these companies that disabled the plants."

"How can they give approval to go dump 100 million gallons of radioactive water in Cape Cod Bay?!" asked another participant incredulously. "That is part of the [Stellwagen Bank National Marine] Sanctuary. It's like, what are you doing? For 44 years, I've been fighting my life with you, to protect this ocean. Because I believe that as long as we keep the ocean clean, there will always be fish. And now you give out these permits, to do this? They just kind of talk from both sides of their mouth."

Policy recommendations:

- Develop procedures with EPA and the Nuclear Regulatory Commission for the evaluation and mitigation of harm associated with nuclear power facility operations, including decommissioning
    - Work with the NRC to require nuclear power operators to self-bond for decommissioning in order to provide for the adequate processing of radioactive wastes during and after decommissioning to prevent impacts to fisheries and the marine environment

Mining and aggregate extraction

Two participants mentioned concerns about seabed mining that could conceivably be undertaken to extract the rare earth metals needed for electrification of the energy system and aggregate extraction for beach nourishment.

"Obviously, with battery technology and stuff today, we need minerals and stuff," said one participant. "You see it with the Pebble [Mine], up there in Alaska. That's the stuff you're going to see. And it's going to come in the back door… And if the Council doesn't have power to watch that stuff?"

"Off of New Jersey… they were literally extracting sand from a well-known fishing hotspot and plopping it on the beach for the tourists," said another participant. "There was no input from anybody. They had a big barge with the thing just sucking the sand up, plopping it on the barge and they came in, right in the same inlet that they were using in Point Pleasant, and stuff like that. I mean, that ledge is gone now. Tourism wins down there. Often in a lot of places it does."

Policy recommendations:

- Work with state agencies to ensure that the harm from mineral and aggregate extraction activities in EFH areas and to sensitive coastal and estuarine ecosystems is minimized to the fullest extent possible
    - Work with GARFO to develop and provide adequate funding for 'rapid response' EFH consultation and conservation recommendation programs as a core function of enhanced EFH consultation processes in response to actions taken during or after emergencies, etc.

Ballast water

One participant expressed concern about the tendency of untreated ballast water to produce species invasions, with knock-on trophic effects and impacts to fishing.

“I’m worried about invasive species, tremendously,” this participant said. “One of the most debilitating invasive species that we had was *Hydrosyphonia* [now called *Dasysiphonia*] *japonica*. It was a seaweed that was introduced from Japan. Came over in ballast tanks. It's devastating to the fishery. It makes huge columns of seaweed that you tow your nets into, and it just closes the nets up. It also gets into gillnets. It coats lobster traps. And it's all over the globe. We need to do a better job ensuring that ballast water is sterile with UV ray systems on cargo ships and tankers so that they can sterilize the water that they have to move around in order to maintain their stability."

Policy recommendations:

- Work with EPA, US Coast Guard and the states to develop a research program designed to anticipate and mitigate future climate change-mediated threats from invasive species in ballast water
- Work with EPA as future opportunities arise to develop targeted metrics for precaution-based requirements mitigating harm from international shipping discharges of ballast water in coastal areas

Ocean plastic

One participant expressed concern about plastic pollution. He shared what he and his community are personally doing to tackle the issue locally.

"In terms of habitat, the … issue is the microplastics, which is I think coming from the breakdown and ultraviolet light and a lot of the plastic films that are getting released,” this participant explained. "We're working on a project getting plastic out of the ocean… Our sector has been bringing in netting and lobster pots and rope. We're not bringing microbeads, microplastics. We can't obviously collect that. Keeping plastic out of the ocean. How we do that, I don't know.”

Impacts of fishing gear

With regard to the impacts of fishing itself, participants described a longstanding commitment to understanding and reducing the impacts of gear on fishing habitat.

“I hate to say that gear is damaging to the habitat, but I'd be quite naive to not recognize some degree of degradation,” said one participant.

"Conservation starts with the man in the mirror," said another. "Every action has consequences, as little as you think: adjusting the nets properly, moving away from concentrations of juvenile fish, just trying to be a responsible steward of your fishery, through your own energies and efforts and knowledge."

"Maybe some people get mad at me when I say this," said another participant, "But we do need to look at the impacts of current uses, too, to make sure that they're compatible with preserving that essential fish habitat. If there's long term impacts of particular fishing gear, that needs to be looked at equally, in my opinion. Sometimes we don't listen to the information that we come up with, when we look at it, because we don't like the answer. That's the first thing I think we should do."

"There should be constant innovation in gears," said another participant. "For example, [trawl] doors have changed so much. We've got doors now that practically don't touch the bottom. It may be possible to get doors that don't touch the bottom at all. That's where 95% of the bottom habitat impact from mobile gear comes from – doors… I know somebody is working on a scallop dredge. I think it's Ron Smolowitz, as a matter of fact. I think he's working on a scallop dredge. It's not like the massive iron with the chain link bag, New Bedford style dredge. It uses springs... There's always somebody out there in a little shop somewhere that's got some great ideas. Superior Trawl... Some great ideas. I've talked to him a little bit about minimizing bottom contact, about using different types of twine to reduce the drag and the fuel burned. It helps the fishermen economically, and it probably helps the environment as well. I mean, there's a bazillion different things."

Four participants suggested that gear innovation could be part of the America the Beautiful initiative, especially in sensitive inshore areas where large boats pulling nets with long wires have had destabilizing ecological impacts in the past.

For example, one participant suggested that gear innovation could be incentivized by giving fishermen access to certain areas if they use certain low-impact gears: "Maybe more selective gears. We're trying squid jigging… I'm not saying as a requirement, but perhaps we can get more boats over that critical habitat for squid eggs, bycatch of young of the year, and stuff which we always run into issues with in Massachusetts inshore, to encourage people to try these different gears… When you talk about closed areas, maybe opening up some areas like George's Bank to hooking, if you want, for squid or something. 'Hey, if you want to try this novel gear out there, go for it. The jigs are small enough that we're not going to disturb, first of all the bottom, but also the groundfish, which I know is a big issue. It should be, but I know there are a lot of squid out there. Trying to maybe move into some areas. I'm not saying bring some small mesh out there. Just maybe trying to foster innovative ideas. 'Oh, maybe I'll play around with these jigs, if I can get up there with some.' Keeps nets off the ground."

Three participants mentioned dredging for surf clams and ocean quahogs as a particularly destructive gear type, and said that precautions should continue to be taken to make sure this gear type is not utilized in highly sensitive bottom habitat, such as the gravel beds used by juvenile cod.

Five participants mentioned ghost gear as an impact of concern. Two said they personally make an effort to bring in any derelict gear they tow up, but said it can be hard to find a proper place on land to dispose of it.

One said, “There's no place to dump this… That’s another thing. You could have facilities on shore, places on shore, where you could dump ghost gear… Because those traps, you throw them back, they're trapping small fish. They're still working.”

Another expressed concern that a shift to ropeless/buoyless lobster gear, in response to concerns about the potential for right whale entanglements, may result in a dramatic increase of lost lobster gear on the seafloor.

Another participant praised a Cornell program that is collecting ghost gear, and suggested expanding this kind of work coast-wide: “How about an initiative in Hyannis, P-town, Point Judith, Gloucester, New Bedford? Other than just saying it's doing the right thing, sometimes some people need incentive. Are there credits or something?... You could get creative. I don't know if you've seen the recycled lobster mats?... Essentially, it's trash picking off the bottom of the ocean. It's picking something up. It's removing it.”

Although many participants recognized that fishing can have negative impacts on fish habitat, nine participants also stressed that some amount of bottom trawling tends to *benefit* certain habitats, and that it would be a mistake to eliminate trawling from these areas altogether, as some conservation groups are perceived to want to do.

“I do feel that commercial trawling helps fish habitat,” said one participant. “I think by commercial trawlers towing a net behind their boat, stirring up the bottom and bringing in the fish that are in that habitat, I feel like it almost like brings new life to the habitat. It's kind of tough to explain.”

Another participant pointed to the fact that trawlers work in the same areas, year after year, as evidence for this assertion: “We're always targeted and labeled, as 'You mobile gear fisherman, it's equivalent to going out and clear-cutting the forest, and just cutting everything down and destroying that forest.' Well, I've never believed that. I've gone back to places for 20 to 30 years, year after year after year, with not just one boat, but 20 to 30 boats, and fished there for a month or more, and caught codfish and caught flounders and caught all of these species. So sometimes, in my eyes, I believe we're like the farmer that cultivates his field before he plants his crops. I think when we tow through the bottom, we churn up the benthic community, and I think it continues to bring more and more life there, because they feed on that. That's my opinion. My opinion is a 180 from a lot of the green groups."

One participant had previously participated in collaborative research on this topic. As he recounted, “One of the really fascinating projects that I undertook was a federally funded grant from the National Marine Fisheries Service, a cooperative research grant. Its objective was to determine and measure the impacts on fish habitat of towing trawl gear over it. We spent two

years and $500,000 doing that. I think we learned a lot. One of the things I learned is that towing trawl gear over some kinds of fish habitat doesn't really do a whole heck of a lot. The big change is actually nature-driven, primarily up in our area. Easterly storms, where you get a big storm surge, that completely homogenizes the bottom and everything gets redistributed all over the place where it didn't use to be. As the lower energy currents and wave energy that's not part of a major storm event comes in, everything resettles back to its former status quo again until it gets remixed through the next big storm system. It's not quite like the Grand Canyon where everything stays the same all the time. That's in soft bottom or sandy or even sometimes gravelly bottom. Boulders and structures like that are different, but they're still impacted by wave energy."

Policy recommendations:

- Provide fiscal support for community based partnerships with fishermen and their associations for the removal of marine debris and enhanced visibility of these programs
- Allocate resources at GARFO/Sea Grant programs, and prioritize Saltonstall-Kennedy research programs to support projects that include a component targeting the objectives/values found in the America the Beautiful report, including fish habitat restoration activities that incorporate participatory stakeholder engagement and the incorporation of stakeholder knowledge
- Prioritize supporting the development of exempted fishing permits to allow access to ecologically sensitive areas using low-impact gear

Finding 3. America the Beautiful is occurring at a time of unprecedented ecosystem change.

Acknowledging the realities of our fast-changing climate will necessitate a reinterpretation of both of the key verbs in "*Conserving* and *Restoring* America the Beautiful." As baselines shift and endpoints become less predictable, conservation and restoration will mean something different in the future than they did in the past. Participants recognized this key point and backed it up with myriad observations from their time on the water.

Fishery ecosystems are changing in complex and wide-ranging ways.

Fourteen participants offered detailed observations about how the ecosystems that support Southern New England fisheries are changing. Below, we share samples of these observations.

"We got this global warming, pollution, whatever you want to call it," said one participant. "The fish are moving to new places to live, new habitat. It's just a matter of time. From 1970 to 2000, fish were stable. From 2010 to 2020, I saw a big change in the habitat of fish and the bottom we used to fish. We could haul our net back and there'd be a completely different world on the bottom. The habitat was affected, from the waters and the sand and what lives on there. Everything's moving."

“Fishing stocks are migrating from traditional grounds to other places, and it's disrupting the ecosystem. No question about it,” said another participant. “There are loligo squid right now in Mass Bay, where they never used to be. Is that a good thing or a bad thing? Right now, if you can get squid, it's a good thing. If they're eating shrimp, it's a bad thing… Fish have shifted north and east and from shallow to deep. In some places, it's made it really tough. For example, if you're a coastal lobster fisherman in Connecticut, you're in big trouble… The value is moving north and east. A lot of it now has ended up in Maritime Canada, which doesn't do us any good, but the Canadians are quite happy with it. And they're happy to export their lobsters down here.”

Several Gulf of Maine participants described a dramatic replacement of cod by haddock in recent years.

- "I've been inshore fishing my whole life,” said one participant. “Ten years ago, you couldn't catch a haddock to make a stew. And there was cod all over the place. Now it's completely flip-flopped. What I think is environmental conditions make it more conducive for one species to reproduce than the other, and then you have regime change.”
- Another participant said, “In the 70s, 80s, mid 90s, Stellwagen was full of cod. No matter where you went, you only caught cod. But this has been altered now. It doesn't happen that way. Now, it's been haddock. What changed, that these two things flipped? It's so important to figure that out.”

In Southern New England, a participant observed: "Narragansett Bay and Block Island Sound were once predominated throughout the year with flounders, whiting, and hake, then lobsters. In my time, we have seen those species drop out. In a short 40-year period, we have seen the population of the bay turn to migratory species like sea bass and scup and fluke. We have seen winter flounder struggle to proliferate… We don't see the lobsters that we did. We have more sharks than I've ever seen in my life. It doesn't seem to be profoundly unhealthy. I mean, squid is one of the victors. It's still economically viable… We have overlap of species that never used to overlap. We have, for example, a couple of years ago, we were catching codfish in February and March that were full of juvenile sea bass an inch long. They didn't used to live beside codfish. Used to be herring, mackerel, whiting, and hake. Now, it's little sea bass. There are paradigm shifts that are ongoing. Who knows what happens farther down the trophic ladder?... We have brown shrimp now. Last month, I could catch a Ziplock baggie a day of brown shrimp. They didn't used to live here. There's a lot of different occupants that are invariably going to produce a lot of different unforeseeable outcomes over the same bottom.”

“It's changed the timing of the seasons,” said another participant. “Because of the warmer water, certain species seem to arrive about the same time in the inshore waters in the spring, but certain species that haven't been here in the summer are here now -- more southern species, because of the warmer water. I would say the fall season has changed a bit because of the warmer water. It's probably later now than it used to be. The certain migrations that used to happen are happening a little bit later in the season, because water's taking longer to cool down."

"Obviously, sea bass is a big one and an easy one," said a Southern New England participant. "We've always had sea bass here, but not in the numbers that we have them now. It's been, obviously, a lot more sea bass lately. And that, in turn, just with your ecosystem effect, they're voracious predators. They thrive here, (A), because of climate change, and (B), because there's a food source here for them."

"Climate change and ocean acidification, for sure," said another participant. "That's going to affect everything from clams down to squid with their little statolith formations. Anything that has some sort of calcium or bony structure that could change. I've read some, but I'm certainly not an expert on it. Anything that can become calcified or decalcified, that's going to be a problem. Warming waters, upwelling, currents, all that stuff. All the changes with that. We've seen it with the Gulf Stream. You read about the changes and the slowing of the Labrador Current, the changes of the areas of the Gulf Stream. How is that going to affect habitat? I mean, it's going to have to. Right? Because things are going to shift. Things are going to die, things are going to thrive, and things are going to change. I said 20 years ago, when I started in this field, things are going to change in the next 20 or 30 years that we're going to see. And I still believe that. We are seeing the change already."

"All of a sudden, this year, the tuna fish showed up right off Scarborough Beach where they historically were, 40 years ago," said a Southern New England participant. "So I don't know. The only thing I learned this year is that maybe change isn't permanent. Maybe it's cyclical, and what comes around goes around. It adds to my confusion, because just when you think you have it figured out, it changes. I mean, there's no denying that black sea bass are more available here now than they ever had been, as long as I've been fishing. We always caught some, but not like now. That seems to be a change that's sticking. I caught a spinner shark this year, fishing south of Block Island, and I saw them east of Block Island a couple of days before I caught the one I did catch. I looked them up, because I didn't even know what the rules were -- if I'm allowed to take them or not -- and I looked it up and the range of a spinner shark stops at North Carolina. That's crazy to me. Then you get on social media and you start hearing and seeing posts from people that are seeing spinner sharks off Long Island, and we saw them off Block Island. I don't know. That seems like it's a change."

"The seal population is just out of control, and something needs to be done about it," said a Southern New England participant. "Because it's definitely having a big effect on fisheries and fishermen."

"Salinity is changing," mentioned another participant. "We work with Woods Hole Oceanographic Institute. We do shelf research. We're seeing the melting of the Arctic. That comes down through the Labrador Straits, and then that blends into the Gulf Stream. And from that, we get warm core rings that spiral and move up on the bank and go from the Canadian line all the way down past the Carolinas. In those warm core rings, we're seeing less salinity and more freshwater, because of this melting effect. Salinity, if you asked me what impact that has on species, I couldn't tell you. But obviously, salinity is necessary. It's necessary for floating, for new larvae or phytoplankton and zooplankton. All of that creates a healthy environment and habitat through the water column. Salinity is a concern. Acidification is a concern. We're doing

some studies where we're seeing the impacts [of acidification] on the growth of shellfish, like a scallop."

This review of participants' observations of ecosystem change makes clear that fishermen collect a near-infinitude of real-time, fine-scale ecological observations in the course of their work at sea. As we will describe later in this synthesis, many participants feel that this knowledge has been underutilized in the fisheries management process, and they hope now to see it more fully integrated into America the Beautiful and other initiatives.

Conservation plans must be designed with change in mind.

The comments above are just a few of the observations made by participants with regard to climate and ecosystem change; we do not want to detract from the larger focus of this synthesis the America the Beautiful initiative by spending too much time discussing aspects that are beyond the scope of this initiative. However, these observations highlight the inexorable fact that habitat conservation work will have to contend with a level of climate-induced uncertainty about both the habitat and species it seeks to conserve and the efficacy of the measures it embraces to conserve the. This is a fact that fisheries management processes are also coming to terms with.

"It is an ecosystem that is in transition, and is not enjoying a manageable path through homeostasis," reflected a participant. "It will defy the best interests and efforts to regulate it, because of stock shifts and unimaginable intercepts in the food chain and food web. I don't know that current management will ever take us where we need to go. It's not my grandfather's ocean. My grandfather's ocean was more manageable. Things were more static."

Climate change can also exacerbate habitat stressors such as those mentioned previously. For example, one participant mentioned that increased storminess may lead to greater alteration of the seabed, with impacts to spawning areas. Another mentioned that he has observed stronger winds throughout the year, including in summer, which may have impacts on stratification, upwelling, larval distribution, and fish migration. Two participants mentioned that increasing levels of precipitation are tied to increases in the amount of sedimentation and runoff entering inshore water bodies. One has seen the rapid siltation of certain inshore areas that has resulted from this.

In sum, as one participant said, "I feel habitats are changing. Whenever they think now, that's absolutely wrong. You go up and down the coast, and talk to people who fish these areas. It ain't the same anymore."

When it comes to America the Beautiful, participants converged around a preference for conservation approaches that recognize and anticipate these dynamic changes, as opposed to those that embrace static area definitions and conservation goals. In short, this synthesis found broad support for the "emphasis on flexibility and adaptive approaches" outlined in Principle 8 of "Conserving and Restoring America the Beautiful."

Policy recommendations:

- Use the Northeast Regional EBFM Implementation Plan, which has received significant public input, as a core component of America the Beautiful conservation actions in New England
    - Use insights from the Plan and roadmap components to inform approaches to achieve climate change resilience and the completed Habitat Assessment Prioritization process to inform approaches to achieving enhanced EFH conservation
- Use the findings of the various regional scenario planning exercises to inform the approaches NOAA takes under America the Beautiful to address the challenges that climate change poses to fisheries and fishing communities

Finding 4. Area management: Learning from experience

New England fishermen have decades of experience with area management in many forms, including: the New England Fishery Management Council's (NEFMC) habitat closures, spawning areas, rolling groundfish closures, and rotational scallop areas; the Stellwagen Bank National Marine Sanctuary; the Northeast Canyons and Seamounts Marine National Monument; and Rhode Island's various Special Area Management Plans (SAMPs). In the next two sections, we summarize participants' reflections on what has worked and what hasn't worked in these experiences.

Positive experiences with area management

Eight participants offered accounts of positive experiences with area-based management. For instance, participants named the following initiatives as being effective at meeting their objectives without too much collateral economic damage to fishing:

- NEFMC closed areas, in general: "The current closed areas as they stand now, for the most part, have been designed to protect the fish during spawning and habitat that's vulnerable."
- Western Gulf of Maine closure area: "The Western Gulf of Maine closure area, in a way, I thought that was okay. Only because the fish, generally in Massachusetts, Cape Cod Bay, come in, and would be in inshore waters until about mid-January or so. Then they kind of would move out to the deeper water, which generally is that Western Gulf of Maine closure area, the east side of Stellwagen. I think it provided some sort of guarded area. It kept fish from being worked on 12 months a year. They got a little break, so to speak."
- Cashes Ledge habitat closure: "Maybe another place where closures make sense is the top of Cashes Ledge where there's a kelp bed. You don't want somebody towing through that kelp bed… It maybe makes sense to have that closed."
- Scallop rotational areas: "A good example of area closures is the scallop fishery, where they close an area where there's a big year class of small scallops to protect the small scallops. But then they reopen it. Somebody goes in there every year with a dredge, or a video system, and looks at the scallops and says, 'Okay, give them another year, and the biomass of these scallop meats will increase, and there'll be a big payback from this

closure.’ Then it opens. It doesn't just stay closed until the scallops die of old age or get eaten by starfish."

Two instances of area management stand out in participants’ comments as exemplars of bottom-up, collaborative area-based management: the Stellwagen Bank National Marine Sanctuary (described by four participants) and the Winter Massachusetts Bay Spawning Protection Area (described by three participants). When describing what they liked about these area management experiences, participants consistently mentioned three things:

- Managed areas were initiated by fishermen themselves.
- Designation of these areas was based on sound science, including cooperative research.
- Neither area’s management places the area permanently or entirely off-limits to fishing.

A participant who helped initiate the Stellwagen Bank National Marine Sanctuary provided the following account of what worked well in that experience: “One of the reasons why we created the Stellwagen Marine Sanctuary [is] because we knew how delicate and diverse that piece of ocean is. We wanted to make sure that nothing gets to be thrown over there. Because there was already a dump site back in the '50s and '60s. And then, remember the big construction project in Boston when they did the highways, which basically took them 10 years, but they didn't solve any problem, right? We fought with them, that they would only throw some clean sand, basically, in the area where the dump site, where the drums are, that were thrown there between the '50s and '60s… It wasn't until 1993, I believe, that the sanctuary was created. It took us about a year and a half to do it. Because it was in desperation… There were already [oil] leases available for Stellwagen. So we decided to go for [a sanctuary on] Stellwagen. At that time, we did have CLF [Conservation Law Foundation] working with us. Richard Delaney was at the [Center for] Coastal Studies, down in Provincetown. We used to meet at UMass Boston, at Columbia Point there, and we had a lot of environmental people supporting the sanctuary. When the time came, though, to design the coordinates that we would want, nobody wanted to do it, because the people were just afraid that eventually they're going to limit fishing there, so ‘I don't want to be the one.’ And basically, at the last moment, I basically put a gun to my husband's head, and I said, ‘You are going to tell me what area. With your experience fishing on Stellwagen, what would be the area that you would want to see protected?' So he did. He did do it. But he asked me to say that I will never tell anybody that he was the one doing it. 'Well, okay, I won't tell anybody.' So we met in Boston. I gave them the chart. 'This is what we want to protect. The person wants to remain anonymous.' That's how we did the sanctuary, the Stellwagen Marine Sanctuary.”

Other participants confirmed that the Stellwagen Sanctuary has worked well. Several participants have served or currently serve on the Sanctuary Advisory Council, which is required by the Sanctuary’s charter to include at least two commercial fishing representatives. One participant stated: “Stellwagen Bank is like a fish pump. The shoal water that's always teeming with -- right now, it's unfortunately teeming with skates and sculpins, because the regime has changed. Five years ago, it was all cod, and a few years before that, it was all yellowtail [flounder]. Eventually, it'll come back to being a marketable fish. But there is so much life there that needs to be protected. We have that extra layer with the sanctuary. I think we're in good shape here, when it comes to protecting… There are no regulatory protections through the

sanctuary. Only NOAA can do fisheries regulatory actions in federal waters. They don't have any jurisdiction with that. But there can never be any strip mining, any sand and gravel. There can never be any of that kind of stuff within the sanctuary. That's what the original intention was. Now, there are people who want the sanctuary to have more power to regulate fisheries within the sanctuary. That, we're not in favor of. Within the sanctuary committee and the things the sanctuary does, you would think that commercial fishermen wouldn't be too excited about it, because some of the thought process that goes into it. But for me, protection and knowing that they don't have any regulatory power is worth the trade off."

Other participants affirmed the importance of drawing a clear line between Sanctuary management and fisheries management, which falls to NEFMC. They described a phase during the Sanctuary's history when a contingent of conservation groups pushed unsuccessfully for elimination of commercial fishing within the Sanctuary. Although fishermen were able to stave off this incursion on the authority of the NEFMC's fisheries management authorities, the memory colors their enthusiasm about future area-based management efforts such as the America the Beautiful initiative.

Nonetheless, the Stellwagen Bank National Marine Sanctuary stands out as a bottom-up, locally-led initiative that continues to be prized by the region's commercial fishermen. In fact, one participant said she is now attempting to bring greater public awareness to the Sanctuary's role in seafood production: "We are promoting the Sanctuary for all the wrecks, the value, this, that, and everything. But don't you think it's time that the Sanctuary is also getting publicized for the fish that are in it? The food production function?.. I mean, you're telling how wonderful this place is, for all these reasons. But the real reason that Stellwagen is important is because the whole thing is fish habitat. It's feeding us… This is what it's producing. It's not the wrecks or the Portland and all these crazy things, but it's feeding you every single day."

The creation of the Winter Massachusetts Bay Spawning Protection Area echoes some of the aspects of the Stellwagen example that have caused it to be embraced by fishermen who see it a support for their businesses rather than a hindrance. A participant who helped initiate this spawning protection area shared the following account: "Our fishermen in the Scituate area were instrumental in getting an area where we knew that codfish were spawning – we got it closed… Working with the state of Massachusetts and with the Stellwagen Bank Sanctuary and with the Woods Hole Oceanographic Institution, starting about 2009, I think it was, we set up an array of transducers. When cod are spawning, they make a grunting noise… There were a couple of spots off the coast of Massachusetts, between Cape Cod and Cape Ann, where every winter we'd go and get what we call the Christmas cod run, usually the month of November or December. There were tons of fish, and they were huge. They were these three-foot-long spawning fish that weighed 40 and 50 pounds. We call them whale cod. It was actually a targeted fishery. Those were old fish. Those were 15- or 20-year-old fish being targeted. The numbers went down and down and down and down. And the numbers of cod, overall, were going down. So basically, the fishermen said, 'This probably isn't a really smart thing to be doing. We ought to start talking to somebody about coming up with a better management system than just targeting these old fish that are in the process of creating new fish.' Not your smartest conservation strategy. We partnered with those people I mentioned, set up the

transducers to find some areas where it appeared that those fish were returning routinely." The coordinates of the area were based on the results of this study. We got them closed at a Council meeting about 2015, I think it was. One of the framework adjustments. So we've got a closure, but it only lasts for three months. It's not permanent. It's there specifically to protect the spawning activities of codfish. It's not because this is a great place and it has to be closed forever. That's one place where closures make sense."

These two examples – the Stellwagen Bank National Marine Sanctuary and the Winter Massachusetts Bay Spawning Protection Area – differ in the jurisdictional authorities and regulatory frameworks involved in their implementation. The first is a program of the NOAA Office of National Marine Sanctuaries and forms part of the National Marine Sanctuary System. It takes an ecosystem-based approach to management with the primary mandate of resource protection, in which certain destructive extractive uses, such as drilling, dredging, and permanent structures, are prohibited, but commercial and recreational fishing are allowed. The second example is part of a suite of area-based fisheries management measures adopted by the NEFMC and it only governs fishing. But as seen in the accounts offered by the participants who contributed to this synthesis, what they share – bottom-up collaboration, a basis in science, involvement of the fishing industry, and a commitment to allowing sustainable fishing within their borders when appropriate – is what makes them examples to emulate as the America the Beautiful initiative advances.

Policy recommendations:

- Incorporate fishery management areas into the American Conservation and Stewardship Atlas that meet the following criteria:
    - A conservation area or area-based conservation measure is based on scientific principles and achieved a specific conservation and management purpose
    - The area or measure is authorized by law and is advanced via public process
    - The area has the support of coastal dependent stakeholders and resource-dependent community members
- Explicitly incorporate dynamically managed conservation areas, including measures to protect critical life history stages of managed species, into the *Atlas*

Negative experiences with area-based management

The qualities described above for the Stellwagen Bank National Marine Sanctuary and the Winter Massachusetts Bay Spawning Protection Area stand in sharp contrast to another recent implementation of marine area-based management in New England – namely, the designation of the Northeast Canyons and Seamounts Marine National Monument, which is widely viewed by commercial fishermen as an end run around public participation.

Affirming this perception and expressing a fear that the America the Beautiful initiative will follow the same path, one participant said, "The 30x30 is just the same thing as the monument closure. I remember the quote that Obama made, 'Wouldn't it be nice to know there's a piece somewhere out there that's not disturbed by man?' One, nobody's ever going to see it. But [also], we have Councils, we have this, we have that. You walked right by all that stuff. And to

close it to red crab, lobster, even gillnets -- they're passive fisheries, as far as the bottom goes, as far as the habitat goes. There's no reason to do stuff like that. It's a feelgood. That's all it is."

"The Biden closing of the canyon areas… That's another stretch," said another participant. "Because we don't fish there. Some of the crab boats do. Some of the lobster boats do. But there's no mobile gear there. That argument is kind of BS."

These criticisms of the Northeast Canyons and Seamounts Marine National Monument are largely process-related.

In addition, participants expressed negative views on the substantive impacts of closing areas to fishing. These comments were generic, rather than referring to any closed area in particular.

- Closures concentrate fishing effort into open areas: "You can't close areas, because it's just going to create more pressure, redistributing the pressure from those areas to other areas. That would just cause more problems. Same amount of effort, but just more concentrated in smaller areas, which would just create bigger problems."
- Temporary closures create an incentive to target these areas when they open up: "My big problem with rolling closures and closed areas opening and closing is right before it closes, everyone gets this mentality, 'Oh, that's going to close next week, so we got to go there and fish as hard as we can in that area until it closes.' Then when it opens, 'We got to get there when it opens, before everyone else gets there, so if any fish are there, we get it first.' It creates this mentality. Then all of a sudden, a place that no one's touched for a month, all of a sudden there's a hundred boats there. But where the fleet nowadays is so small and so spread out, if you didn't have these rolling closures and guys just moved around between open area and open area, you'd spread out more… Whatever supposed benefit you got from the closure, it was eliminated in the first hour of it being open."
- Closures aren't necessary because fishing effort has already diminished so much in the last two decades: "I mean, the numbers of fishermen are so limited right now, because of the permitting and the management, and then all the way things are managed with quotas. It's already enough. There's enough management in place to keep the fish stocks healthy, as far as what's being harvested, without having to close areas. That's just too extreme."
- Closures aren't effective at increasing fish production: "Closing us down generally will not help anything. There's been recent publications. Even NMFS is finding out that closed areas, in terms of increasing species production, are not as helpful as once thought. It works for scallops, but that's just solely so that way scallops can grow up in the area, before they get mowed over. That's not increasing production… But Closed Area One and Closed Area Two, those have been found out that they really aren't doing a whole lot for the fish stocks that they were meant to preserve."
- Closures can create a mystery zone due to the lack of fishery-dependent data that they create: "We can't even prove that there's no codfish there, because we're not allowed in there for years. Then they say, 'Well, gee, you know, you have no landings of dabs and this and that for all these years.' 'Well, when the fish were there, you wouldn't let us in

there. You let us in when the big ones are gone and the little ones are there.' Now you're saying we are only fishing on little ones.'"

- Closures can lead to decreased productivity: "Closing areas down and saying it's better habitat? It might be more diverse, but what's the diversity? And I don't even know if it gets more diverse, to tell you the truth. Because I think having that fishing activity, I think it creates feeding opportunity for other things. That's kind of my feeling on habitat. I don't see a lot of value in closing areas down."
- Closed areas can create refuge for predator and competitor species that end up reducing the biomass of the species that areas are trying to protect: "What ends up happening is when an area's not fished, you end up getting things like skates and things that just kind of hang out and drive the other fish out."

In sum, participants expressed a view that *closed areas* -- as opposed to other forms of area-based special management – have a variety of negative consequences, including unintended ecological consequences. Although many participants also saw value in closing certain areas to specific gear types from time to time to protect ecological function, they cautioned against blanket closures to all fishing, particularly when such closures are driven by purely "aesthetic" or "feelgood" motives, as is perceived to be the case in the Northeast Canyons and Seamounts Marine National Monument.

Policy recommendations:

- NOAA should not support area-based fishing closures that are not based on an explicit conservation need and targeted to narrowly address known threats to vulnerable areas or species
- NOAA should use public processes including Council-based management measures for the implementation of any fishery restrictions based on the development of specific recommendations to address specific threats to fisheries or marine ecosystems

Finding 5. Recommendations for selection of conservation areas under America the Beautiful

In this section, we draw upon lessons learned by participants in their past experiences to frame a series of recommendations for implementation of area-based management within the context of the America the Beautiful and other initiatives.

Area selection should focus on the most vulnerable areas.

Participants concurred that some areas require additional layers of habitat protection beyond what fisheries management can provide. These areas are both critical for supporting certain life stages of fishery resources *and* are highly vulnerable to existing or proposed non-fishing impacts.

Six participants mentioned estuaries and salt ponds as being in need of greater scrutiny and protection for their value in fishery life cycles:

- “Anything that's going to harbor and protect the future of the fishery, meaning like the juvenile fishes, that should be protected 1,000%. I've always been in favor of that. Around here, there's been a lot of development around the coast. It gets a little concerning, what destruction it's going to do to juvenile fish.”
- “I think anywhere where there's going to be fish aggregations have to be protected. Maybe more in the estuaries and the bays. As far as the runoff, the chemicals that end up in those areas are probably more concentrated in those inshore areas. That probably should be more of a priority.”

Moreover, estuarine areas can provide vital carbon sequestration services to help combat climate change, said one participant, and restoring them could create positive feedback loops both locally and for the planet: “I believe that we should be looking to re-enlist our waterways and our bays as carbon sequestration basins. I think the planet has a role in our solution to climate change, and just enabling it to do what it can for us, while we are trying to make modifications to our own behavior, is a huge factor. Long Island Sound, the Chesapeake, Narragansett Bay -- all these places used to be loaded with seaweed. And now their capacity has really been reduced dramatically because of the way we treat sewage. We don't have the plants on the bottom sequestering carbon like we did. As a result, every bit of carbon we produce is felt right at the core of the planet, as opposed to being absorbed and sequestered by vegetation, which was the big guy's plan.”

In the ocean, participants mentioned Nantucket Sound, Cox’s Ledge, Brown’s Ledge, and the Southwest Ledge off Block Island as critical habitat areas that need additional protection, especially from heavy extraction and industrial development:

- “I would say anywhere that is identified through stakeholder input as being really important for juvenile and larvae production, and just essential fish habitat. For example, if you asked us down here, obviously, Cox's Ledge is going to come up. Browns Ledge can come up. Southwest Ledge off of Block Island, places like that. There's going to be specific areas identified that really, some of this industrial activity should be off limits.”
- “Cox's Ledge, there is no one that's fished in southern New England that hasn't recognized the composition of the biodiversity, especially codfish… So, why would you not want to label that? Well, it is essential fish habitat, and we want to protect that.’”
- “We should… start to look at areas like [Narragansett] Bay or Nantucket Sound… That is a healthy spawning ground. It really is. It should be labeled… It should be just a small boat, small capacity [area], and a short season. I think they manage it fairly well. It is a federal area, but it's managed by the state of Massachusetts. They do a decent job in the Sound.”

Selected areas should be designed to adapt as conditions and needs change

Recognizing the intersectional nature of climate change and habitat, four participants stressed the need for area-based management to be dynamic in response to changing ecological conditions. These recommendations are in line with Principle 8 (“emphasis on flexibility and adaptive approaches” outlined in “Conserving and Restoring America the Beautiful.”

“[When the council was] designat[ing] essential fish habitat, there was very little scientific advice given on a lot of that stuff,” said one participant. “If someone marked that they caught a codfish here or codfish there, then that became EFH for codfish, or if they caught something else. Today, that same area could be destitute of codfish like up off of Gloucester. Well, they've gone on somewhere else. So now what do you do? Do you leave it still as a designation of EFH? Or do you go looking to find what you should be protecting today, as opposed to yesterday? A lot of these things, once they get put in place, there's very little modification or updating or changing. These regulations, whether they were good, bad or ugly, it makes no difference. You should always go back and review the benefits of it and see if it's working."

“I basically look at the ocean as a place that's always in flux,” said another participant. “One of the problems is that we want to make the ocean a place that's fixed, where we can draw neat little boxes, and assign different management structures to those little boxes, and everything works just nifty. And it is not. Everything is moving… If you're talking about a place that's that historic spawning spot of codfish, it probably won't be the historic spawning spot of codfish forever. Something else will move in and take codfish's place and will be productive.”

“It’s not land,” said another participant. “It's not like you can say, 'Okay, here's a boundary here. Here's a boundary there, and there. They're going to leave that alone.' It's not like that. It mixes and changes. It's transitory. It's not static. It's not static like land. Weather has dramatic changes to it, too. You can have a pretty good storm and there will still be trees in the conservation land down the street. Maybe a few will get knocked over. But [in the ocean] you can have a pretty big storm, and you can see real dramatic changes."

Area selection should uphold fisheries goals and utilize fisheries management processes

Three participants expressed the importance of continuing to use the public processes available through the regional fishery managing council process to designate and implement area-based management, rather than circumventing this public process. They also commented that area management should jive with – and ideally, even reinforce – the goals established through the Magnuson Stevens Act and the regional fishery managing council process. These recommendations reinforce Principle 8 (“build on existing tools and strategies”) outlined in “Conserving and Restoring America the Beautiful.”

“When you're working to do something new like that, you want to attract the people to help you,” one participant said, referencing the unpopular Northeast Canyons and Seamounts Marine National Monument. “You don't want to push them aside and make them resistant to it.”

"Specific to 30 by 30, we already conserve a lot of our oceans,” observed another participant. “Our management system through the Magnuson Stevens Act is geared up to protect all of the water. We're already doing a lot of things… We do have a pretty good system. Our council system -- through coral protection, all of our habitat protection areas, our spawning enclosures, we implement a lot of protection, so that the creatures can do what they need to do in life

already. I just don't understand why we have to go beyond that… I just hope that they let the Councils continue to do what they've been doing."

"It shouldn't necessarily be fishermen that are targeted and kicked out in these areas," said another participant. "Let's have protected areas, but allow us to fish them and benefit from them. Allow the country to benefit from the most regulated protein production we have. The lowest carbon footprint. It provides jobs and a way of life, everything. I would just say, let's make sure that it's not, 'Okay, it's closed. You guys are out of there,' like with the seamounts and the canyons over there."

Area selection should support ecological functions that are critical to fisheries

Four participants stressed that area-based management should have clearly identified goals related to ecological function, and that the areas chosen should be keyed to these goals in demonstrable ways. Participants eschewed conservation actions driven by "aesthetic" or "feelgood" motives. These recommendations are in line with Principle 5 ("pursue conservation and restoration approaches that create jobs and support healthy communities") outlined in "Conserving and Restoring America the Beautiful."

"One of my pet peeves about closed areas is we just close it for the sake of closing it," said one participant.

"Some of the closures, from what I understand or what I remember, back when I was on the Council, were actually advocated by a couple of scientists who had been down in the submarines and saw it," said another participant. "'Oh, it's beautiful and this and that.' [They have] probably never been down again since, and no one else has. They better find better ways or better reasons for adopting these closures. If you adopt the wrong place, and you push the fisherman into another area, chances are it could be worse for the habitat. You should know, basically, what you're doing, or that what's occurring is what you want to do."

"Rather than just say, 'Oh, we closed 30% of the ocean! Now we're great,' how about let's look carefully at what we are going to close, like spawning, like growing scallops, like really important benthic features like rocks and coral reefs and kelp beds and things of that sort," said another participant. "It has to be done on a detailed basis, and then it still has to be monitored. Let's look at closing other things on an interim basis to find out. If there's a year class of fish that needs to be protected, okay, we'll close it for a year, like the scallops. If we need to close a spawning area, let's figure out when they're spawning, and reopen it again once the fish have dispersed."

"A lot of these things, someone draws a big square, and it's not very specific," said another participant. "I don't think NOAA, and I don't think NMFS, has the kind of technology or knowledge to really divine out what's really important and what's not important, differences in habitat. I don't think they've done that."

Additionally, one participant stressed that ecological function should take precedence over narrowly defined conceptions of aesthetic beauty when designating areas for management: “Beauty through the eyes of function, as opposed to beauty through the eyes of landscaping, which I'm afraid this project will go down the road of, in great folly, if it's left to the opinions of people who do not know or are not dependent on the ocean… The name of the proposition [America the Beautiful] leads me to think that they won't appreciate the green, odorous, primordial ooze at the north end of Narragansett Bay that is the foundation of life. They will continue to look at things like that as something to eradicate.”

Area selection should be based on quality rather than quantity, and must be grounded in science rather than politics.

Participants expressed a fear that the America the Beautiful’s 30x30 goal places arbitrary numerical goals ahead of meaningful conservation.

“The implication [of the 30x30 goal] is the more you close, the better off you are,” observed another participant. “Closures have a place. Absolutely. For unique habitat: a coral reef, a Cashes Ledge, a spawning area or something like that. But that's not necessarily permanent, and it needs to be monitored to look at the cost versus the benefit. I just don't see that happening.”

Another participant said, “Just randomly coming up with some number, [saying that] 30% of our oceans and lands have to be protected... It's like you're drawing a box on Nantucket Shoals. You're just drawing a box to draw a box. You don't really know if it's 30% or 29%, or 31%, or 15% or 85%. You need to spend some time understanding, and if you don't have the right information, you need to get it first.”

One participant said that framing fish habitat conservation in arbitrary numerical goals is like “putting lipstick on a pig” – a feelgood measure that has little actual benefit.

In sum, these views caution against overemphasis on the “area” part of the phrase “conservation areas,” and urge NOAA to focus on the “conservation” part of the phrase. As we will see in the next section of this synthesis, for many participants, adding an additional layer of conservation to Southern New England waters will not mean doing more of what the NEFMC is already doing. It will mean addressing the critical missing piece of fisheries conservation: non-fishing impacts to habitat.

Policy recommendations:

- NOAA’s America the Beautiful conservation actions should be accomplished by first identifying the specific threats to an area of high value or importance; secondarily determining the most robust and targeted mechanisms for the minimization or mitigation of those threats; and finally by implementing regulatory authorities, including any spatial designations, to achieve such threat minimization or mitigation

    - Regulatory actions to achieve targeted conservation objectives or to prevent impacts to vulnerable areas of the ocean should be achieved through public processes whenever possible
- Work with the various Sanctuary Advisory Councils where appropriate to determine the existence of any threats to fisheries resources or marine habitat, and use the existing process mandated by the National Marine Sanctuaries Act for the promulgation of conservation measures under the Regional Fishery Management Councils
- Do not consider the Antiquities Act in the list of statutory vehicles providing NOAA with existing authority under America the Beautiful, as the establishment of Marine National Monuments is contrary to the core principles of the America the Beautiful report
- Support adaptive management measures and incorporation of management flexibility in the proposed designation of any area-based conservation measures under America the Beautiful

Finding 6. NOAA America the Beautiful actions must place non-fishing impacts front and center

Participants expressed concern that the America the Beautiful initiative could be weaponized to harm fishermen, especially the small-scale inshore fishermen that are already most vulnerable to the impacts of coastal and offshore development. Instead, participants urged NOAA to leverage the initiative to *support* commercial fishermen by addressing environmental impacts that are typically left out of fisheries management, and by doing so in close collaboration with fishermen themselves.

One participant said, “When you're talking about… 30 by 30, my concern is that we get lumped in and we're as fishermen targeted for these closed areas, just saying a blanket statement, 'You guys are off limits,' when, as I said already, commercial fishing has been going on for hundreds of years and we still have a beautiful environment out there. But when you start talking about wind farms, or oil and gas, things of that nature, mineral extraction -- there's like a million things… My fear is that we get unnecessarily targeted and lumped into these closed areas where we've been operating, and we still have an environment. So why are we going to get kicked out of them, when we're not the ones that would cause an issue?”

Another participant expressed a view that although non-fishing impacts to essential fish habitat are recognized in the fisheries management process, too little is done to address them: "I think, to me, one of the first things that would be helpful is to listen to the processes that we have in place to protect essential fish habitat. We have science centers at the National Marine Fishery Service that define essential fish habitat. And there's policies that we have and a system that we have in place to protect that area that's identified as essential fish habitat. We don't do that. We don't follow our own rules. We don't need more rules. We just need to follow the ones that we have, and make a commitment to protect those areas from anything that's super harmful. Like, say they want to do aggregate removal of sand or something. If that's within an area that's considered essential fish habitat, that's a non-starter. Essential fish habitat should be a non-starter item for anything new, to start out with, any new industries… We already know

how to define essential fish habitat. Do it, and then just make it so that you preserve it, because it's good for everybody."

The lack of rigorous protections from non-fishing impacts is nothing new, and it has been acknowledged by many over the years as a shortcoming of U.S. fisheries management. However, with the increasing pressure placed on fishery ecosystems by offshore development and inshore habitat degradation, coupled with climate change, participants view it as more necessary than ever before to fill this gap. To be meaningful to the fishing industry, the America the Beautiful initiative must be designed to do just that. Below, we synthesize a few specific recommendations put forth by participants on how NOAA and other federal agencies can do a better job of addressing non-fishing impacts to fishery habitat.

Slow down offshore development and perform more thorough impacts assessment

Six participants shared a view that offshore wind permitting is moving too fast to adequately consider the potentially enormous impacts that such developments will have on the ocean ecosystem.

“They have to slow down, if not even stop and pause the wind farm development, to study the hell out of what's going on there,” said one participant.

“What we really need to do, from my perspective, is to put in Vineyard Wind and then monitor the heck out of the thing for five or ten years before we start building more of them,” said another.

Another participant highlighted the need for cumulative impacts assessment of wind farm development, and said that cumulative impacts should be modeled before any development begins. Currently, he said, impacts assessment is done after the fact on a site-by-site basis.

“They need to be monitoring,” said another participant. “Certainly for the wind farms, they need to be keeping an eye on doing studies on how they're going to affect our fisheries and the stocks now and in the future. Hopefully, there's a way to see how it's affecting them.”

“We need a lot more research into the potential impacts of these before we just have this buildout,” said another participant. “These projects are now coming fast and furious. And as you know, you can't even keep up with the notices of who's got an NOI, who's in a DEIS, an EIS, who's got a COP, who's got stays on their COP, and where is it involved? And you know BOEM is just going to push everything through as fast as possible. It just gets so hard… Yes, I would say we need more research into that. I think that goes into that in general, there's always a need for more and better data on our fisheries. It's becoming for more purposes than just our stock assessments. It's becoming sort of the baseline for these effects of these projects. Some of that's already too late in this area. We've had too much industrial activity going on. Six 250-foot boats out there, 24 hours a day, three summers ago is just, there's got to be an impact on it… And then there needs to be oversight and guidance into what is acceptable. Because, they have no problem with touting fisheries monitoring and their gear claim forms. They just put it out in

a press release and it all sounds good to the public. But, if it sucks, nobody knows that except for us. And what happens is, you don't feel it right now, but down the line, ten years from now, you're like, 'Hey, turns out that baseline really sucked. It wasn't adequate.'"

One participant recommended slowing down until a comprehensive re-assessment of essential fish habitat and vital fishing areas can be completed to guide the siting of offshore wind farms. This participant acknowledged that such a process *has* been initiated in years past by the NEFMC and Rhode Island's Coastal Resources Management Council (as well as the Northeast Regional Ocean Council), but he said that participation by fishermen was stymied by mistrust: "The New England Council went through that whole process a few years ago of identifying essential fish habitat…. I would say [we need] more of that, and maybe even a redo of what was done before these wind energy areas were identified -- the lease areas. It's impossible to go back and take it all back. But I think when that process was going on, a lot of guys didn't really know what was at stake, so it was more like, 'Hey, you want to know about this area, and you only want to know because you want to shut us down.' So guys didn't really speak up. And this is what happened. We got that one little smiley face taken off of the south bank of Coxes Ledge, which was mostly sand. It's not even the hard cobbly bottom on top. I think if it were redone right now, that area would be a lot larger. Southfork wouldn't be on the table. Revolution wouldn't be on the table. Maybe just simply identifying it and actually having regulations that are firm. 'Hey, this is off limits.'"

Policy recommendations:

- As above, work with GARFO and with NOAA sister agencies to establish policies encouraging and/or requiring agencies to adopt EFH Conservation Recommendations from NOAA EFH consultations
- Expand stakeholder awareness of NOAA EFH consultations and EFH conservation recommendations through messaging and via enhanced visibility at the New England Fishery Management Council
- Work with GARFO and BOEM to develop robust and well-publicized EFH conservation recommendations for proposed OSW projects, and encourage their incorporation into preferred alternatives for project design and construction wherever possible
- Work with colleagues at the Department of the Interior and wherever appropriate to abandon the procedurally flawed "Smart from the Start" OSW permitting posture, and replace with a process that fully evaluates environmental and fishing community/business impacts of offshore energy development prior to leasing
- Fully investigate the impacts of EMF, acoustic energy emissions, and other physical disturbances associated with the siting and construction of OSW facilities to fisheries, fish habitat, and the environment, and approaches that incorporate stakeholder knowledge, as an immediate research priority
    - To date, resources provided for the development of this critical area of research is woefully inadequate; approaches that incorporate stakeholder knowledge have not been prioritized
- Develop communications strategies designed to circulate and publicize NOAA's work to ensure that fish habitat conservation is a core component of the agency's engagement in the OSW planning and permitting processes

Offshore development must be held to the same standards as fisheries management

In the offshore wind development context, NOAA's Greater Atlantic Regional Fisheries Office (GARFO) has used the Essential Fish Habitat (EFH) consultation process outlined in the Magnuson Stevens Act to express concerns about the impacts of development on critical life stages, feeding patterns, and other aspects of ecological function that are vital to the sustainability of fisheries. Both the NEFMC and the Mid-Atlantic Fisheries Management Council (MAFMC) have published offshore wind policy declarations that spell out the importance of evaluating the full range of impacts to managed resources from construction, operations, and decommissioning of wind farms, including cumulative effects.

While participants generally feel that these actions are on the right track, some fear they fall short of the mark in holding offshore development to account for its potential impacts on fishery resources. Without a stronger framework in place, many fear the conservation progress made over the last 25 years of fisheries management is likely to be undone.

One participant stated, "Until there is a broader group of people that value what is in Magnuson, we're kind of in an echo chamber. We're going to do the right thing with draggers and gillnetters and lobster pots, but the wind farms can come in and just do what the hell they want. So, a lot of the work that the Councils are doing at the request of Magnuson is going to be overtaken, overwhelmed, and underperformed, by virtue of there not being a larger audience that appreciates the things that are deeply woven within that document… Magnuson was voted on by 100 senators and received a unanimous vote. No one senator had a chance to vote for a wind farm… To actually follow the policies that were originally set forth for preserving and protecting these resources, and realizing that, 'Hey, we've done all the work for fisheries management for decades now. And now we're just going to throw it all away, so we can mine sand and build wind farms and everything else?' It's just ludicrous… I know in 1976, we put a couple of 100 million dollars into restoring an aging wooden fleet. Fishery science was young, but they kept telling us we don't know if the stocks can handle a rejuvenated American fleet. And Magnuson didn't really have the teeth. And the scientists did not have the support of environmental groups or the industry or politicians. So we invested a couple of 100 million, against the advice and consent of science. We immediately translated capitalization into environmental degradation. And here we are again, going to do it with wind farms. Now the magnitude is hundreds of billions of dollars. And I'm fearful that even if the impacts are minimal, relative to the investment, the sheer enormity of the investment and the hand of man will touch such a previously untouched area, in such an almost magnificent kind of a way. It's like, 'Oh my god, they're a thousand feet tall. The cable's that big and it goes for 1,500 miles.' So I guess they choose to have a short memory. I have reminded them of this. I think it's everyone's responsibility to say, 'Look, we learned this lesson. We've been 40 years untying this knot -- 45 years, 46, 47. And we don't need to do it. Things as complex and wonderful as the Atlantic Ocean don't unf**k once you've f**ked them up."

Policy recommendations:

- As above, work with GARFO and with NOAA sister agencies to establish policies encouraging and/or requiring agencies to adopt EFH Conservation Recommendations from NOAA EFH consultations
- Expand stakeholder awareness of NOAA EFH consultations and EFH conservation recommendations through messaging and via enhanced visibility at the New England Fishery Management Council

NOAA needs greater authority over offshore wind siting and permitting

In the America the Beautiful initiative, the Department of Commerce and the Department of Interior are co-equal partners with a shared commitment to conserve 30% of the nation's lands and waters by 2030. But when it comes to addressing impacts of offshore wind farms to fishery resources, there is an imbalance of power in which BOEM (within the Department of Interior) may act according to its own authorities without meeting the standards of fisheries management established by NOAA (within the Department of Commerce).

This is due to the disjointed nature of federal decision making with regard to the oceans, in which one agency has jurisdiction over fisheries and another has jurisdiction over energy development. Existing laws such as the Magnuson Stevens Act and National Environmental Protection Act allow NOAA to engage in consultations with BOEM, but they do not require BOEM to actually abide by NOAA's advice. This dynamic stands in contrast to stronger legislation such as the Marine Mammal Protection Act and Endangered Species Act, which *require* agencies like BOEM to abide by NOAA's recommendations to impose specific environmental standards on developers as a condition for approving projects.

Participants in this synthesis would like to see a more equal balance of powers between BOEM and NOAA when it comes to the permitting of industrial uses of the ocean that have the potential to impact fisheries. Seven participants mentioned the lopsided nature of the existing power balance as a threat to the future of fisheries.

"That's the real problem: that BOEM doesn't have to consult with anybody," said one participant. "That's what scares me: that they have full power."

"There is no check to BOEM," said another. "If they decide they're experts on safety and navigation, then they are. They're a runaway rogue agency."

"I want them [NOAA] to step up and be more forceful in their objections to things," said another participant. "Not just write a letter and say, 'Oh, we can't approve this.' Step up. 'Hey, we've done the work. We've done this. We've done that. We're trying to preserve these things for these purposes.'

"Obviously, every fisherman has their issues with NMFS, but at the same time, we do need them," said another participant. "I will say, this wind farm issue is sort of almost uniting fishermen with NMFS. Because they're getting sort of muzzled and put on the backburner by

BOEM, I think it's really incensing them. They want their input to come out. They feel strongly about that. And finally, they know how we feel."

“The problem always starts with the federal government, with the Department of Interior,” described another participant. “Independently, they decide which piece of ocean to give out. That is my goal, so we can be at the table before they make those decisions. Because once they make those decisions, when we find out, it's too late.”

“It's a broken system,” said another participant. “Where are the checks here and the guidelines? I think they should have NOAA involved, when it comes to fish habitat like that, and any of that -- HAPCs. They can only regulate and manage *us*. And if they can regulate and manage us fishing-wise, they should be able to regulate and manage anything that's going to be put in the ocean. Because [otherwise] we are the only ones that are going to bear the brunt of whatever changes occur. If it's a negative impact on a fish, it's going to be us that have to absorb that. 'Sorry, there's not enough. They've moved and you can't fish here anymore. Or the habitat's degraded so much.' I don't know. There's a disconnect there.”

Policy recommendations:

- As above; work with GARFO and BOEM to develop robust and well-publicized EFH conservation recommendations for proposed OSW projects, and encourage their incorporation into preferred alternatives for project design and construction wherever possible
- Work with colleagues at the Department of the Interior and wherever appropriate to abandon the procedurally flawed “Smart from the Start” OSW permitting posture, and replace with a process that fully evaluates environmental and fishing community/business impacts of offshore energy development prior to leasing
- Fully investigate the impacts of EMF, acoustic energy emissions, and other physical disturbances associated with the siting and construction of OSW facilities to fisheries, fish habitat, and the environment, and approaches that incorporate stakeholder knowledge, as an immediate research priority
    - To date, resources provided for the development of this critical area of research is woefully inadequate; approaches that incorporate stakeholder knowledge have not been prioritized
- Develop communications strategies designed to circulate and publicize NOAA’s work to ensure that fish habitat conservation is a core component of the agency’s engagement in the OSW planning and permitting processes

Connect the dots between upland, estuary, and ocean habitat health

As mentioned previously in this synthesis, offshore wind is only one of the major non-fishing impacts that participants voiced concern about; the other major category of impacts included upland and nearshore impacts such as runoff, pollution, wastewater, and coastal development. As with offshore development, participants believe that NOAA and the regional fisheries management councils have too999 little authority over these non-fishing impacts to fisheries ecosystems.

"Lots of people have brought up the concern in estuaries and river systems, and that NOAA Fisheries has no jurisdiction over that," said one participant. "I think there needs to be some connection and some work and some focus on… managing the river systems that are coming into the ocean, and how we can work together on that, with pollution that comes down, runoff, the health of estuaries and bays, on young of the year and eggs. Same with power plants, factories… That's connected too. Every time it's brought up, people, rightfully so, bring up concern… Unfortunately, they let the people talk, and they said, 'You know, you can comment, but I'm just letting you know, we have no jurisdiction over that.' It's ridiculous… Our bays and our estuaries, they need to be brought into account… All of that is all related to the ecosystem. I think that needs to be taken [into consideration]… They [estuary habitat and fisheries management] need to be forged. Because they can't be separate."

Policy recommendations:

- Develop robust EFH conservation recommendations for local and state actions that adversely impact coastal and estuarine areas of EFH
- Exercise the authority to prescribe fish passage under the Federal Power Act in order to conserve diadromous fish

Embrace ecosystem-based management and holistic conservation

Several participants referred to concepts like ecosystem-based management and holistic management as routes to better address non-fishing impacts to fisheries. These participants would likely favor an interpretation of America the Beautiful that stands up ecosystem-based management processes for areas critical for fisheries resources.

"What is that new management that they wanted to do?" asked one participant. "Ecosystem based? It's not individual species. It's more like, looking at the whole ecosystem… They should have been [doing that all along]. You can't just look at things individually. You have to look at the big picture. Yeah. That makes sense."

"Given the length of the links in the food chain and the relationship that things we can't even see without a microscope have to do with alpha predators at the top of the trophic ladder," said another participant, "I think the whole thing is important. I think it starts with water quality. It goes to unfettered bottom, clean of debris. It goes to fishing with a high degree of accountability. I mean, it's all connected. I don't see fences as solving problems. I think higher thinking will solve problems, and realizations of how dependent we are on things that we don't even begin to understand."

"I think what we are in sore need of is a document," this participant continued. "A foundational document to govern over the development of the blue economy. This document would be Magnuson-like. It would be scientifically compelled. Somewhere in about the second sentence, it would say, 'And do no harm.' It would have rigorous testing required for new endeavors. We don't know the effects of wholesale open-ocean aquaculture just yet. We don't know the consequences of wind farms. We don't know what sand mining or harvesting aggregate from

the bottom of the ocean will do. But I doubt it enhances anything. When we think that we can do these things without consequence to ourselves, somewhere down the road or the next generation, I think we are acting in folly. I think we have to be guardians of the ocean, because it is where all life comes from."

Policy recommendations:

- As above, use the Northeast Regional EBFM Implementation Plan as a core component of America the Beautiful conservation actions in New England
    - Use insights from the Plan and roadmap components to inform approaches to achieve climate change resilience and the completed Habitat Assessment Prioritization process to inform approaches to achieving enhanced EFH conservation

Finding 7. Ensuring a collaborative and science-driven process for America the Beautiful

In conservation work, a well-designed process can be critical to a successful outcome. In their comments, participants echoed the importance of commitments outlined in "Conserving and Restoring America the Beautiful," especially the commitments to pursue a collaborative and inclusive approach to conservation (Principle 1), support locally led and locally designed conservation efforts (Principle 3) and use science as a guide (Principle 7). Below, we synthesize participants' recommendations regarding these three process principles.

Use science as a guide

Many participants expressed a view that conservation should be driven by science, not politics. They also stressed that the current universe of data utilized in fisheries management (mainly consisting of federal trawl surveys) is much too narrow. The America the Beautiful initiative can act as a laboratory to incorporate a much more comprehensive range of valuable data into management, including fishery-dependent data, cooperative research, observer data, and fishermen's ecological knowledge (FEK).

"Sound science, to me, solves a lot of issues," said one participant. "I can live with changes and protection and all, if it's done with sound science. If we're going to invest in it, we should invest in good sound science. These days, with these acoustic tagging capabilities, where we can catch some codfish and you can tag them, and then you put receivers and transponders on the bottom, so every time they swim by one, 'Bing, bing, bing.' Now you get to see the migration pattern. You get to see how many are there, how many stay or move. As opposed to tagging, where we did two or three thousand tags, and we'd be lucky if we got 20 back. I think we should. I think we should invest in it. I think we should monitor, with good science."

"I think the only habitat damage we ever incur is when the politics of fishing don't allow good, scientifically founded decisions to take root," said another participant. "I think we should have done more to offset the impacts of ocean quahogging with the jet dredges. We should have

done more to keep scallopers out of codfish bottom in the channel. Codfish are dependent, at a certain life stage, on little niches and whatnot. Complex bottom to hide in, because they're what's for lunch. I don't think we understood enough about dogfish. We were protecting them, when we should have been hammering them. Thanks to the Research Foundation, we were able to set that right. Fishery science is only about 30 years old. Good fishery science. The stuff we're doing now is so much better than the stuff we did 30 years ago. I think we're going to get there. I think it's no one's place to be frustrated. It's your place to do what you can do to make it better and assume that it's going to get better."

In implementation of America the Beautiful, participants said, all available knowledge should be on the table when making decisions. Participants pointed to many sources of fisheries-dependent and cooperative research data that could provide additional insights into marine ecosystems, especially as they undergo transformation as a result of climate change and offshore development.

“The Northeast Fisheries Science Center… of course runs the Henry Bigelow survey,” said one participant. “I think they're technically proficient people who know what they're doing. But it's one boat. I won't say a tiny boat because it's a huge boat. But it's a tiny net. It's just an industry size net. There's nothing special about it. And it gets used twice a year and it samples 1/100 of 1% of the seabed twice a year. It doesn't really look at things. There's other means of looking at things besides towing a net over it. One of which is acoustic. Another is video. Doing some of these different ways of looking at the bottom of the ocean to see what the heck's going on down there, that could be farmed out, that you don't need a Henry Bigelow to do. You can use an industry vessel to do the same thing… There's just a lot of tools out there now, between video and acoustic and probably other stuff. Well, there's another one, too, that they're using now -- I don't think it's caught on yet -- using DNA. When fish are spawning, it releases DNA to the ocean. By sampling the DNA you can determine where the aggregation -- usually these are big aggregations -- a big aggregation like the spawning herring, for example, will show up mixed in with the seawater. All that kind of stuff. There's all kinds of tools… There just needs to be a better influx of information. It's just been stifled in the last few years.”

“Woods Hole seemingly circles the wagons every time you challenge anything,” said another participant. “They cry ‘best available science’ and they won't allow any independent data into the stock assessments. They tell you fishery data is being used, but it's only being used to calculate mortality. It's not used to calculate abundance. All their abundance numbers are basically coming from the trawl survey. That is a big line of frustration for us. Whereas there's so much data out there -- fishery dependent data -- that can be used. We've been avoiding cod for the last seven years. Now they're saying, "Well, you guys aren't landing any cod." But we're not landing any cod because we're avoiding it. So it's a catch-22. We're just going around in circles. They're not seeing the size and age disparity throughout the whole landings, when they're doing their port sampling, because nobody's fishing for it. You're just picking one off here and one off there. You're not going to get a true snapshot of the biomass size and age when you're not fishing in the cod areas. That just all falls on deaf ears."

“I think we should use more science,” said another participant. “We should use a lot of fisheries-dependent data. We should use what foundations are doing, what academia is doing. I think we should collaborate. Don't rely 110% on the Bigelow. I think we should go out on other vessels and do research at sea, in real time throughout the year. We shouldn't just do a spring and fall survey. I don't think the kind of gear that we use is appropriate, even though they'll tell you it is. I think it should be a mixed type of gear. I think we should include more of what NEAMAP [Northeast Area Monitoring and Assessment Program] does. I think we should do more of that here in the wind area, with a boat, centralized maybe out of Point Judith. We need to do more research on George's. I don't think we do enough collaboration. I think NMFS doesn't want to have the finger pointed at them. They want control. They have this immense machine that controls everything in the science center. And that's how it's going to be. 'Take it or leave it, take it or leave it.' I mean, I've heard 'Take it or leave it' from the scientists for decades. Very narrow minded. Anything that we offer or consider. We've had a study fleet for what, 15 or 20 years? All that sits on a shelf. We don't use it. Why do we have it? To say, 'Oh, we're reaching out. We're working with the industry.' 'Well, shit, you spent tens of millions of dollars, and it sits on a shelf.' I have a hard time. When you go to SSC meetings, and you sit there in a room with these brilliant marine biologists. It doesn't matter. Look, the system is geared for peer review and allows peer review. But they're deaf. I don't think they listen. From the industry, they don't listen. You might get Jason McNamee, you may get Steve Cadrin, you may get a few people like that who can pique some interest. But my head's gotten flat from pounding it against the wall, trying to make a point of what we see: real time, what's changing, what's evolving, what's happening.”

“The open cod end survey… needs to be adopted and really put in place,” said another participant. “If they want to really get better at what they're doing, they need to really work on their Bigelow surveys that way. That might be helped by the wind farms, because they're not going to be able to do their trawl surveys in the wind farms. They're going to need fishing boats."

Support locally led and locally designed conservation efforts

In their comments, participants often made reference to their own FEK, as well as FEK that had been passed down to them by previous generations and other fishermen. As these ecological observations made clear, the knowledge that fishermen possess about fish distribution and migration is often at a much final spatial and temporal scale than the information collected through scientific instruments such as trawl surveys. This fine-scale information appears well suited for integration into area-based management strategies such as those contemplated under America the Beautiful.

"The wealth of knowledge of the guys have spent 50 or 60 years at sea, the knowledge they have is invaluable,” said one participant. “And it has to be recognized."

"I think that there's a really important role for the current industries, like fishing, to participate in helping to define even better where essential fish habitat is,” said another participant. “Because the fishermen have a tremendous amount of knowledge, from over years and years of

fishing, to see a couple things. First is where areas are, that are productive, and how things have changed over time, to be able to define areas that were less important 20 years ago that suddenly are important now, or vice versa. That institutional knowledge, I don't think can be replaced by scientists at a government agency. You need to have that pairing of the two… You got to continue to study and characterize areas as they change. I think that's where the fishing community can be the most help, offering that experience on the water."

Unfortunately, some participants said, there has been a general reluctance on the part of NOAA to "work with" fishermen in the past. One participant explained: "We should work together. The smartest people on the ocean are commercial fishermen in their areas. Because I spent like 60 years. And you got some guy that read a couple books, went to school, and he thinks he knows more than we do. But they don't, and they don't want to listen. I've called up a couple of times. I'm retired now. I offered my time, so we can work together. They said, 'Oh, no, we have our own people.' That's the problem."

One participant offered the following example of how working together can improve area-based management: "I think fishermen and scientists need to work together. I think they are. I think there's some clam companies that are working on special programs where they can go do the research. I'm drawing a blank on what they call them right now. Exempted fishing? They allow them to go in and study these areas. Because I think, from what I've heard, they draw these boxes, but the habitat isn't consistently the same across the whole box. There's areas that you might be able to actually prosecute a fishery, that isn't going to impact the types of habitat that you want to protect. So having the fishing community and the scientists work closely together, to be able to really say, 'Look, this is a spot where you guys can drag through all you want, and you're not going to really upset the applecart at all.' That would allow them to go in there. But other places they say, 'No, if you dredge through this bottom, you're going to mess up all the cobble bottom or all the little lobsters or where the cod like to lay their eggs or do whatever it is that they're trying to accomplish. You got to stay out of this portion of it.' You could really get better resolution to the areas you do close, so you're closing less area but bring more productive."

Policy recommendations:

- Work to enhance NOAA cooperative research capabilities and make cooperative research and stakeholder knowledge a core pathway to collecting new data used to manage our nation's fisheries and coastal resources
    - Develop a national plan for the development of stakeholder knowledge-based processes for stock assessment peer review, and encourage NEFMC and GARFO to collaborate on the development of information pipelines from NOAA social scientists to the regulatory process in a predictable and tractable manner
- Provide guidance and encouragement to science centers and Science and Statistical Committees to incorporate fishermen's ecological knowledge into fisheries science and stock assessments wherever possible

Pursue a collaborative and inclusive approach to conservation

Six participants described trust and collaboration as vital ingredients in successful conservation initiatives. Unfortunately, several noted that trust is in short supply when it comes to NOAA's relationship with commercial fishermen.

"The fishing industry feels that they've been used and abused," said one participant. "In all these years, we have not really ever found a sympathetic ear from NOAA, [who would] listen to us, to make us feel that we are part of this whole process. It's always been, 'We're the bosses. You do what we say, otherwise you will get in trouble."

If left unaddressed, such mistrust threatens to erode the potential of America the Beautiful to heal historical rifts and place ocean conservation on the stronger, more collaborative footing that is vitally necessary to confront the challenges of the day. In a worst-case scenario, America the Beautiful may actually *increase* mistrust, if it is not conducted with a careful eye to collaboration and listening.

"There needs to be a higher level of trust between industry and NOAA and NMFS," said a participant. "Because I think if there was, way back when, when CRMC was going around, when the Council was going around asking us specifically, 'Where do you think is important?' Asking questions like, 'What species do you see where? Where do you fish? Do you think that there's larvae and juveniles there?' and things like that, I think we would have had a better process. So maybe, at the basis of everything, there needs to be a higher level of trust. That's something that the industry has been looking for, and asking for, for years. And it's almost like, 'Okay, well, we're going to trust you guys this time.' And then, whatever data you give them, it gets turned around and either doesn't get used or gets used sort of against you. I hate to say that. I hate to think like that. But over a long career, that seems to be, unfortunately, the way a lot of things are."

Participants also shared success stories of when efforts to build trust and collaboration paid off in better science and management. A state-waters fisheries leader described his process of building better relationships with state fisheries regulators: "I think that's the biggest thing that fishermen [need] -- I'm looking big picture perspective now -- is the trust and to want it to work with the people that make the decisions. It's up to them and you… Once everybody agrees on the facts, and what's out there, then you can fight about policy, but at least you're on the same page. I think that's really the balance point, is trying to manage fisheries with fishermen and regulators… It takes two to tango. The fishermen have to understand that. Like we really pushed the biomass studies to be done by the fishermen. And we worked with the Fisheries Center. Basically, they hired four or five fishermen… and they basically did all the survey, instead of having DEM do it. They got to see the difference in what the dredge says and what the quahog dredge says, the quahoggers. It really kind of solved the issue for a lot of our people. Now they saw that they were working with them. And the results were something they could say, 'Yeah, I did that. I did that.' As opposed to them just telling you what it is, and you saying 'No, you're wrong'. Bringing everybody in and working together. Once you all agree on the facts, the rest, you can figure out or you can fight over… Before it used to be so argumentative. We'd have meetings and there'd be fighting with DEM. It's like, 'Wait a minute.

You guys are the regulators. You're not supposed to fight with us!' That's kind of changed and gotten better. It's all about leadership. It's all about people."

Two participants alluded to the challenges facing working fishermen in becoming productively involved in science and management, whether it be fisheries regulations or initiatives like America the Beautiful. The offered three straightforward recommendations that would make such processes more inclusive and accessible to working fishermen:

- Schedule meetings at times that fishermen are less likely to be on the water, such as wintertime: “We have a closure, all the state of Mass, from February 1 to May 15. I'm not telling you we're not doing anything during that period, but we're more accessible, more available then. Groundfish have got the same thing. Scallopers have got the same thing. They have their closures. Maybe a little more consideration needs to be taken into when these meetings and stuff are planned.”
- When funds are available, offer stipends to fishermen to allay the expenses of attending (unlike staff of government agencies, nonprofits, and academic institutions, fishermen’s time and travel is not covered, and often represents a net economic loss): "It would definitely help, especially at $3 a gallon or $4 a gallon for gas to travel somewhere… Obviously a stipend's always [nice] because it's hard to go to a meeting [where everyone else is getting paid and you're not]… It's not like we're going for a big paycheck. Just respect. Acknowledge who we are, what we know, what we bring to the table.”
- Offer communications materials that explain things in everyday language: “Make it so that a commercial fisherman doesn't need a college degree to have to read these emails that are sent out to us on a weekly / daily basis, telling us what's going on in our own industry. If we could simplify that a little bit more. I mean, I consider myself semi-intelligent and I still have a tough time reading some of these rules and regulations and things that they do, because everybody that's implementing them has like eight years in college.”

Policy recommendations:

- Appointments to the forthcoming Marine and Coastal Area-Based Management Federal Advisory Committee should be made with significant representation from fisheries stakeholders, scientific experts with significant experience in the co-development of local and traditional knowledge, and individuals with a proven track record of inclusive support for diverse perspectives in conservation at local, regional, and national scales.

Conclusions

In this final section of the synthesis, we cross-reference the content that we have already presented above to six of the questions that NOAA put forth in its October 29, 2021 “Request for Information on NOAA Actions To Advance the Goals and Recommendations in the Report on Conserving and Restoring America The Beautiful, Including Conserving At Least 30 Percent of U.S. Lands and Waters By 2030.”

Criteria to consider when identifying areas to conserve or restore

In the RFI, NOAA asked: what criteria should NOAA consider in working with other agencies to identify existing or potential new "conserved" or "restored" areas for the purpose of advancing the goals and recommendations in the "Conserving and Restoring America the Beautiful" report?

Our synthesis revealed the following suggestions in response to this question:

- NOAA should focus conservation efforts on the areas that are most critical to life states of fishery resources and most vulnerable to degradation, especially from non-fishing impacts that have been insufficiently addressed in fisheries management to-date.
- These areas include estuaries (especially Narragansett Bay), salt ponds, and ocean ledges that are used as key spawning and feeding sites (such as Cox's Ledge, Nantucket Sound, Brown's Ledge, and Southwest Ledge off of Block Island).
- When designating areas for additional layers of conservation, NOAA should embrace clearly defined goals that are keyed to ecological functions critical to fisheries production in demonstrable ways.
- NOAA should prioritize quality over quantity and avoid "aesthetic" or "feelgood" motives, when identifying areas.
- Criteria for identifying areas should align with and reinforce the goals of fisheries management as outlined in the Magnuson Stevens Act and the relevant regional fisheries management councils.
- Areas should not be closed to fishing, but should enhance fishing by protecting critical life stages from non-fishing impacts.

Additional scientific and other expertise that NOAA should consider

In the RFI, NOAA asked: what additional scientific information, Indigenous Knowledge, or other expertise should NOAA consider in order to advance the goals and recommendations in the "Conserving and Restoring America the Beautiful" report?

Our synthesis revealed the following suggestions in response to this question:

- NOAA should take into account the full array of available scientific information that is currently available with regard to fisheries resources, including fisheries-dependent data, cooperative research data, eDNA data, acoustic data, and a variety of other data collected by NEAMAP, nonprofits, and academic institutions. To date, these sources of information have been insufficiently integrated in the stock assessment process. "America the Beautiful" should set the highest possible bar for integration of diverse data streams into decision-making and monitoring.
- NOAA should take into account the fine-scale FEK and real-time observations gathered by commercial fishermen in the course of their work at sea. This may require the establishment of best practices for FEK collection, in order to synthesize knowledge from multiple stakeholders into usable bodies of knowledge.

How NOAA should measure progress

In the RFI, NOAA asked: How should NOAA consider tracking its actions and measuring its progress, including with partners, toward advancing the goals and recommendations in the "Conserving and Restoring America the Beautiful" report?

Our synthesis revealed the following suggestions in response to this question:

- NOAA should continuously monitor the status of ecosystems and fisheries both within and outside conservation areas.
- Wherever possible, this monitoring should be undertaken by, or in collaboration with, users of the area such as commercial fishermen.
- Too often, conservation areas suffer from a lack of data because no fisheries-dependent data is generated and management agencies don't invest enough in continued monitoring and research.
- Area management should be adaptive; if new information reveals that an area is not serving its purpose or could serve its purpose better by doing something differently, adaptive action should be taken.

How NOAA can support non-Federal entities to advance efforts to conserve U.S. waters

In the RFI, NOAA asked: What actions should NOAA consider taking to support non-Federal entities, including tribal, state, territorial, and local governments and non-governmental organizations and other private entities, to advance their efforts to conserve and restore U.S. lands and waters?

This synthesis has revealed a plethora of creative, bottom-up ideas for conserving marine ecosystems and fishery habitats. Participant comments suggest that the most important thing that NOAA can do to help support fruition of ideas like these is to *listen* and *learn from* commercial fishermen. Building a relationship of mutual trust will be critical to this endeavor. Area management can be used as a tool to engineer collaboration, trust, and the integration of diverse and innovative perspectives that will make for more effective conservation. The effects of this collaboration may even "spill over" into other areas such as fisheries management. However, ill-crafted area management approaches have the potential to further entrench the attitudes of mistrust that have stymied innovation and collaboration in fisheries management for decades. Extreme care must be taken to ensure that the principles outlined in "Conserving and Restoring America the Beautiful" are faithfully followed.

Actions NOAA should take to facilitate broad participation

In the RFI, NOAA asked: What actions should NOAA consider taking to facilitate broad participation in the America the Beautiful initiative?

As this synthesis demonstrates, local and state-based fisheries associations are eager to work hand-in-hand with NOAA to assemble the science, FEK, local creativity, and commitment that

will be necessary to advance the priorities of "America the Beautiful." We invite NOAA to continue the conversation that we have initiated in this synthesis, and to reach out to commercial fishermen's associations in other states as well.

Additional information NOAA should consider

In the RFI, NOAA asked: What additional information should NOAA consider as relevant to its role in implementing the America the Beautiful initiative?

The synthesis that we have presented here is replete with additional information that NOAA should consider. In this synthesis, fisheries participants revealed extensive experience with what works well and what doesn't when designating special areas. They detailed a litany of both fishing-induced and non-fishing impacts to fisheries habitat, described what they are doing to do to address negative impacts from fishing, and outlined a forceful plea for greater attention to non-fishing impacts, especially from offshore wind development and degradation to estuaries. They pointed to an array of solutions that could address some of these most pressing impacts, and offered recommendations to nurture collaborative and scientifically sound conservation in the years ahead.

Though cautiously hopeful, the fishermen who contributed to this synthesis are aware of the enormity of the challenges that lie ahead. "America the Beautiful" arrives at a time when Southern New England fishery ecosystems and fishing communities are contending with two major ecological transformations occurring simultaneously: climate change and the rapid industrialization of the ocean environment by offshore wind farm development. In this context, conservation is needed more than ever – but it may be harder to achieve. It remains to be seen whether "America the Beautiful" is up to the task.

Participants

The following individuals contributed their views and expertise to the development of this synthesis by participating in interviews. Interviews were conducted by Sarah Schumann of Shining Sea Fisheries Consulting, LLC, and Shaye Rooney of the Commercial Fisheries Center of Rhode Island.

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