



**Utilizing the expert knowledge of commercial fishermen
to develop solutions for minimizing gear conflict if on-
demand ropeless fishing is adopted as a strategy to reduce
fishery impacts on North Atlantic right whales**

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December 2023

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Executive Summary

There is a particularly urgent need for action to reduce serious injuries and mortalities of North Atlantic right whales (*Eubalaena glacialis*, NARW) due to entanglements in vertical lines. The most ambitious solution being pursued is on-demand fishing using acoustic technologies. Although these systems could offer the greatest protection to the NARW, in addition to other endangered and threatened species, if continued pot and gillnet fishing is permitted, these technologies are currently very expensive and untested at a broad commercial scale. Moreover, gear conflict between fixed bottom gear (pots and gill nets) and mobile gear (dredges and trawls) could increase substantially if bottom gear is not marked with surface buoys.

To support the effort to develop on-demand ropeless fishing as a strategy for reducing commercial fixed-gear fishery impacts on critically endangered NARW, Coonamessett Farm Foundation (CFF) proposed using the expert knowledge of commercial fishermen to offer potential solutions for minimizing gear conflict between fixed gear fishermen and between fixed and mobile gear fishermen. The specific objectives of this effort included:

- 1. Determining if currently available maps of fishing effort by fishery – generated using Vessel Monitoring System data, Vessel Trip Reports, and logbooks – agree with patterns of monthly and/or seasonal effort that are known to fishermen.***
- 2. Compiling a list of gear conflict agreements in the project area of focus.***
- 3. Compiling a list of ideas for reducing gear conflict if the average number of vertical lines per day must be reduced by 90% or more.***

CFF staff interviewed commercial fishermen who fish in the Outer Cape Lobster Management Area (LMA), LMA2, the LMA 2/3 overlap, and LMA3 north of 40°N latitude. Fishermen were contacted by email, texts, phone calls, and in-person at fishing piers in New Bedford and Chatham, MA and Point Judith, RI. To expand outreach to fishermen on Cape Cod, the Cape Cod Commercial Fishermen's Alliance included a project summary and call for participation in its membership newsletter. Out of 156 fishermen contacted about participating in the project, 28 were interviewed. The participants were active and retired fishermen with experience in a range of fixed- and mobile-gear fisheries. Semi-structured interviews were conducted based on a list of questions that were designed to collect the information needed to address the project objectives. Participant responses to questions about reducing gear conflict were aggregated based on the type of fishery participated in by each fisherman, with answers categorized as from a fixed-gear fisherman, a mobile-gear fisherman, or a fisherman with experience in both types of fisheries.

The first project objective was to determine if currently available maps of fishing effort by fishery agree with patterns of monthly and/or seasonal effort that are known to fishermen. Fishermen who viewed the project effort maps did not state that any of the maps were incorrect overall, but this assessment was qualified in some cases with suggestions for improvements or concerns. Multiple fishermen pointed out that fishing effort can shift year to year. Some suggested looking at effort

averaged over a decade or more. However, others stated that they were concerned that older effort maps might be incorrect due to climate change and shifts in species distributions.

To address the second project objective, fishermen were asked to share any knowledge they have of existing or recent gear conflict and gear-setting agreements in the project area. Their answers included details about time-area closures in existing regulations and informal agreements. Informal gear conflict agreements included historical/verbal agreements that certain fisheries use certain areas, historical agreements based on fishing along Loran lines, and temporary agreements reached over the radio during fishing trips.

The third project objective focused on minimizing gear conflict if the average number of persistent vertical lines in the water must be reduced by 90% or more. Fishermen were asked to share their ideas, and in almost all cases, they assumed this line reduction would be accomplished through on-demand fishing although this was not explicitly stated. The solutions suggested by participating fishermen could be grouped into the seven categories below:

- 1) Improving technology
- 2) Creating time-area closures for different gear types
- 3) Reducing the number of permitted traps
- 4) Using hybrid trawls (on-demand combined with traditional buoys) or single endlines
- 5) Offering more training for fixed- and mobile-gear fishermen
- 6) Offering portals where fishermen can voluntarily share the locations where they fish
- 7) Fishing along lines (in agreed-upon directions)

Fishermen had many concerns about on-demand fishing related to gear conflict. More than half of the participating fishermen were concerned about how mobile-gear fishermen would know where on-demand gear was located. Other main concerns were related to the need for real-time accurate gear locations and the reliability of on-demand gear.

Some fishermen were hopeful that advances in technology and gear incentives could make the use of on-demand gear feasible. There would be a learning curve as fishermen learned to adapt to a new way of fishing. The hope of the older fishermen was that the younger generation could embrace these new technologies, allowing their fisheries to survive.

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Acronyms

AIS	Automated Identification System
ALWTRT	Atlantic Large Whale Take Reduction Team
ASFMC	Atlantic States Marine Fisheries Commission
CAII	Closed Area II
CFF	Coonamesett Farm Foundation
DST	Decision Support Tool
EEZ	Exclusive Economic Zone
EFP	Exempted Fishing Permit
FCC	Federal Communications Commission
FR	Final Rule
FMP	Fishery Management Plan
GARFO	Greater Atlantic Regional Fisheries Office
LMA	Lobster Management Area
LOA	Letter of Acknowledgement
NARW	North Atlantic right whale(s)
NEFSC	Northeast Fisheries Science Center
NOAA	National Oceanic and Atmospheric Administration
SAMS	Scallop Area Management Simulator
SNE	Southern New England
VMS	Vessel monitoring system
VTR	Vessel Trip Report

Background

There is an urgent need for action to reduce serious injuries, mortalities, and morbidity of North Atlantic right whales (*Eubalaena glacialis*, NARW). One of the leading causes of NARW injury and death has been identified as entanglements in the vertical lines of fishing gear. Researchers have estimated that over 80% of endangered NARW have been entangled in fishing gear, and 10-25% of NARW and humpback whales acquire new entanglement scars each year (Knowlton et al. 2012). The best estimate for the number of right whales in 2022 is 356 whales (Linden 2023), and recovery of the species will require a reduction in risk due to entanglements on the order of 50% to reduce the probability of quasi-extinction to less than 0.50 (Runge et al. 2023). A practical and reliable solution to mitigate these entanglements has been elusive.

Proposed and enacted management scenarios for reducing risk to NARWs have included a range of measures that incorporate reductions in persistent vertical lines, time-area closures, and fishing gear innovations. The most ambitious solution being pursued is on-demand fishing using acoustic technologies. Although these systems could offer the greatest protection to the NARW, in addition to other endangered and threatened species, if continued fixed-gear fishing is permitted, these technologies are currently very expensive and untested on a broad commercial scale. Moreover, interactions between fixed bottom gear (pots and gill nets) and mobile gear (dredges and trawls) could increase substantially if bottom gear is not marked with surface buoys. Not surprisingly, fixed- and mobile-gear fishermen have expressed concerns about on-demand fishing increasing gear conflict (Oppenheim 2022).

Instances of gear conflict could increase with other management measures that reduce the presence of traditional surface buoys used to identify the location and layout of fixed gear in an area. These measures include the use of single-endline trawls or hybrid trawls with surface buoys on one end and on-demand gear on the other end. Gear conflict could also increase if management measures, like time-area closures, shift fishing effort of one fishery into an area traditionally used by another fishery. Other management measures would not be expected to increase gear conflict, but they may negatively impact fisheries or have limited impacts on risks to NARWs. Caps on the number of traps and increasing the number of traps per vertical line (i.e., trawling up) would decrease the number of vertical lines, but they may directly impact fishery economics and fisherman safety (Myers & Moore 2020, Willse et al. 2022). Measures that reduce the risk of entanglement through gear innovations that include continued use of vertical lines and surface buoys (e.g., weak rope or weak inserts) would not increase gear conflict. However, these measures can also impact fisherman safety (Willse et al. 2022), and their use may not reduce risk to smaller species and life history stages and may continue to cause sub-lethal effects that negatively impact the NARW population (Knowlton et al. 2016, Hayes et al. 2018, Myers et al. 2019, Stewart et al. 2021).

To support the National Oceanic and Atmospheric Administration (NOAA) Fisheries effort to develop on-demand ropeless fishing as a strategy for reducing commercial fixed-gear fishery impacts on critically endangered NARW, Coonamessett Farm Foundation (CFF) proposed using the expert knowledge of commercial fishermen to offer potential solutions for minimizing gear conflict

between fixed gear fishermen and between fixed- and mobile-gear fishermen if on-demand fishing were to be adopted. This effort addressed Step 2 in the Northeast Fisheries Science Center (NEFSC) Ropeless Roadmap, specifically “Resolving Gear Conflict” (NEFSC 2022).

Ropeless and on-demand fishing

The terms ropeless and on-demand fishing are often used interchangeably for fishing with acoustic release of surface markers/buoys and no permanent vertical lines. On-demand fishing is increasingly used when referring to the majority of systems because they are not truly ropeless and include rope that is present in the water column for a short period of time after surface gear is released or inflated. On-demand systems release a coiled vertical line or lift a modified trap in response to an acoustic signal. Ropeless fishing could be interpreted as including a broader range of options like grappling for gear without vertical lines. The term “on-demand” will be used throughout this report.

On-demand systems are under development by multiple companies, and there is an ongoing effort to develop gear-location methods and technologies that would operate across all systems and provide regularly updated gear locations (Baumgartner & Partan 2019, Galvez et al. 2023). This includes developing acoustic standards for all manufacturers. Recent 2023 meetings hosted by the Ropeless Consortium and NOAA Fisheries have highlighted increasing efforts to develop streamlined systems for mobile-gear fishermen to use for identifying the presence of fixed gear when no surface buoys are present.

Right Whale Decision Support Tool

The NOAA Fisheries Right Whale Decision Support Tool (DST) was built to provide managers and other stakeholders with a tool for visualizing the spatiotemporal overlap between fixed-gear fisheries and NARW distributions in waters off the eastern coast of the United States. It was developed to model how the risk of entanglement to right whales may change with shifts in the spatial distribution of fishing effort and modifications to commercial fishing gear configurations. The DST includes modeled estimates for monthly densities of vertical lines from commercial fisheries and modeled estimates for monthly NARW densities (NEFSC 2023). Baseline risks are incorporated for each fishery based on typical gear configurations, rope types, and fishing effort distributions. Relative risks to NARW are estimated as the product of (1) the density of vertical lines associated with fixed-gear fishing at a given location for a defined spatial distribution of effort by month, (2) the density of NARW at the given location by month, and (3) the threat vertical lines pose to NARW given the specific configuration of the gear relative to other gear configurations. The threat posed by different gear configurations is based primarily on rope strength (Knowlton et al. 2016). Risk is quantified on a point basis, and suggested measures to reduce risks are scored based on the risk reduction points.

Runs of model scenarios for the Atlantic Large Whale Take Reduction Team (ALWTRT) have included a range of measures to reduce risk including caps on the number of traps, increasing the number of traps per vertical line (i.e., trawling up), use of single-endline trawls, closures with gear

relocated to new areas, closures with gear removed from the fishery, and incorporation of additional weak rope.

Gear conflict amendment and other existing management approaches

The gear conflict amendment was implemented in 1996 as Amendment 8 to the Multispecies Fishery Management Plan (FMP), Amendment 6 to the American Lobster FMP, and Amendment 6 to the Atlantic Sea Scallop FMP (NEFMC 1996). Gear conflict had been an ongoing and long-term problem for fisheries in waters managed by the New England Fisheries Management Council (NEFMC), with the most notable conflicts occurring when mobile-gear fisheries moved into areas historically utilized by fixed-gear fisheries as species distributions changed or gear was modified to operate in new habitats. The NEFMC proposed developing a process to deal with gear conflict after gear conflicts between the offshore lobster fishery and a growing deepwater monkfish fishery in the same area could not be resolved through voluntary informal agreements.

The amendment outlines a process for adjusting the frameworks for the fisheries managed under these three FMPs, including a range of preferred generic measures listed in **Table 1**. The gear conflict amendment allows the NEFMC to quickly respond to reported gear conflicts and make adjustments to multiple FMPs as needed. The generic measures included in the amendment are broad and intended to encompass any specific framework adjustments that might be proposed. Consequently, the amendment also allows for the 30- to 45-day public comment period for framework adjustments under this amendment to be waived, with public comments given at two framework meetings instead.

Outside of the framework process, fishermen can report gear conflict issues to the NEFMC, and the Council can request that bulletins be sent to fisheries involved in the conflict (NEFMC 2020b). For example, a fixed-gear fisherman setting gear in Lobster Management Area (LMA) 4 south of Long Island reported in 2020 that his lobster gear was frequently being lost to the scallop fleet operating in the area (NEFMC 2020a, **Appendix A**). He was advised by staff at the NEFMC to contact the Scallop Advisory Panel of the NEFMC and report the issue. The NEFMC voted to request that NOAA Fisheries send a bulletin to all scallop permit holders with details shared by the fisherman, including when and where the gear conflict was occurring and how the lobster trawls were being set (NEFMC 2020b). These bulletins are still being sent, with the last one dated August 10, 2023 (**Appendix A**).

Table 1. Preferred generic measures to resolve gear conflict. Details or examples are quoted directly from the 1996 gear conflict amendment (NEFMC 1996).

Measure	Details or example from the amendment
Mandatory monitoring of a radio channel by fishing vessels	Vessels fishing within a gear conflict management area would be required to continuously monitor a certain radio channel.
Fixed gear location and reporting requirements	Fishermen could be required to send a message and location report when fixed gear is deployed. This message data could be stored at a central site for downloading to other vessels upon request.
Standards of operation when gear conflicts occur	When disentangling another vessel's gear, it should be removed in a way that minimizes damage to the major components of the gear. If gear is returned to the water, fishermen should discard it or repair it so that it is marked by a float and anchored so that it shouldn't drift away.
Fixed gear marking and setting practices	Improved marking requirements for fixed gear to ensure visibility under normal and adverse conditions, [rules] to limit the amount of fishing area taken up by fixed gear, [requirements] to set gear in a certain direction or along specified bottom contours [or] fish their gear within defined lanes through a gear management area, [or requirements] to continuously monitor their gear.
Gear restrictions for specific areas (including time and area closures)	Fishing areas would be set aside for specified periods to allow access by one or more gears. Fishermen using an incompatible gear type would be given access to those grounds during other seasons.
Vessel monitoring systems (VMS)	Any vessel fishing within a gear conflict management area would be required to have functioning VMS equipment aboard.
Restrictions on the number of fishing vessels or amount of gear	Controlling the density of fishing effort [by setting] a ceiling on the amount of fixed gear and trawling activity that is permitted in a defined area... based on reducing gear conflict and not on conservation or localized abundance of the target species.
Special permit conditions	Revise the permitting procedures so that special conditions or industry agreements would become an integral part of a vessel's permit and apply when it fished within a gear conflict management area.

Project objectives

The specific objectives of this effort included:

- 1. Determining if currently available maps of fishing effort by fishery – generated using Vessel Monitoring System data, Vessel Trip Reports, and logbooks – agree with patterns of monthly and/or seasonal effort that are known to fishermen.*
- 2. Compiling a list of gear conflict agreements in the project area of focus.*
- 3. Compiling a list of ideas for reducing gear conflict if the average number of vertical lines per day must be reduced by 90% or more.*

Methods and Interview Participation Summary

CFF staff interviewed commercial fishermen who fish in the areas highlighted in **Figure 1**. The main area of focus included the Outer Cape LMA, the LMA 2/3 overlap, the proposed Southern New England (SNE) restricted area in LMA 3 and the portion of LMA 2 that overlaps with the South Island Restricted Area. This area includes regions of high revenue for the lobster and other pot, sink gillnet, trawl, scallop dredge, and clam dredge fisheries during recent years (**Appendix B**). The area also includes the MA/RI offshore wind lease areas (**Figure 1**). Interviewed fishermen also fished in the expanded area of focus which included the rest of LMA 2 and LMA 3 north of 40°N latitude and east of the SNE restricted area (hatched areas in **Figure 1**).

The target number of interviews for the project was a minimum of 20-30 fishermen. Fishermen were contacted by email, texts, phone calls, and in-person at fishing piers in New Bedford and Chatham, MA and Point Judith, RI. To expand outreach to fishermen on Cape Cod, the Cape Cod Commercial Fishermen’s Alliance included a project summary and call for participation in its membership newsletter. The Atlantic Offshore Lobstermen’s Association was a planned collaborator on the project, but they opted to end the collaboration after reaching out to their membership and learning that no one was willing to participate. Out of 156 fishermen contacted about participating in the project, 28 were interviewed, giving an 18% response rate. The participants were active and retired fishermen with experience in a range of fixed and mobile gear fisheries (**Table 2**). Out of the 28 fishermen who were interviewed, twelve were fixed gear fishermen, eight were mobile gear fishermen, and eight participated in both types of fisheries.

Table 2. Interviewed fishermen had experience participating in the listed fixed and mobile gear fisheries.

Fixed gear fisheries	Mobile gear fisheries
Lobster pot	Bottom trawl
Crab pot	Scallop dredge
Sink gillnet	Clam dredge
Bottom longline	Mid-water trawl

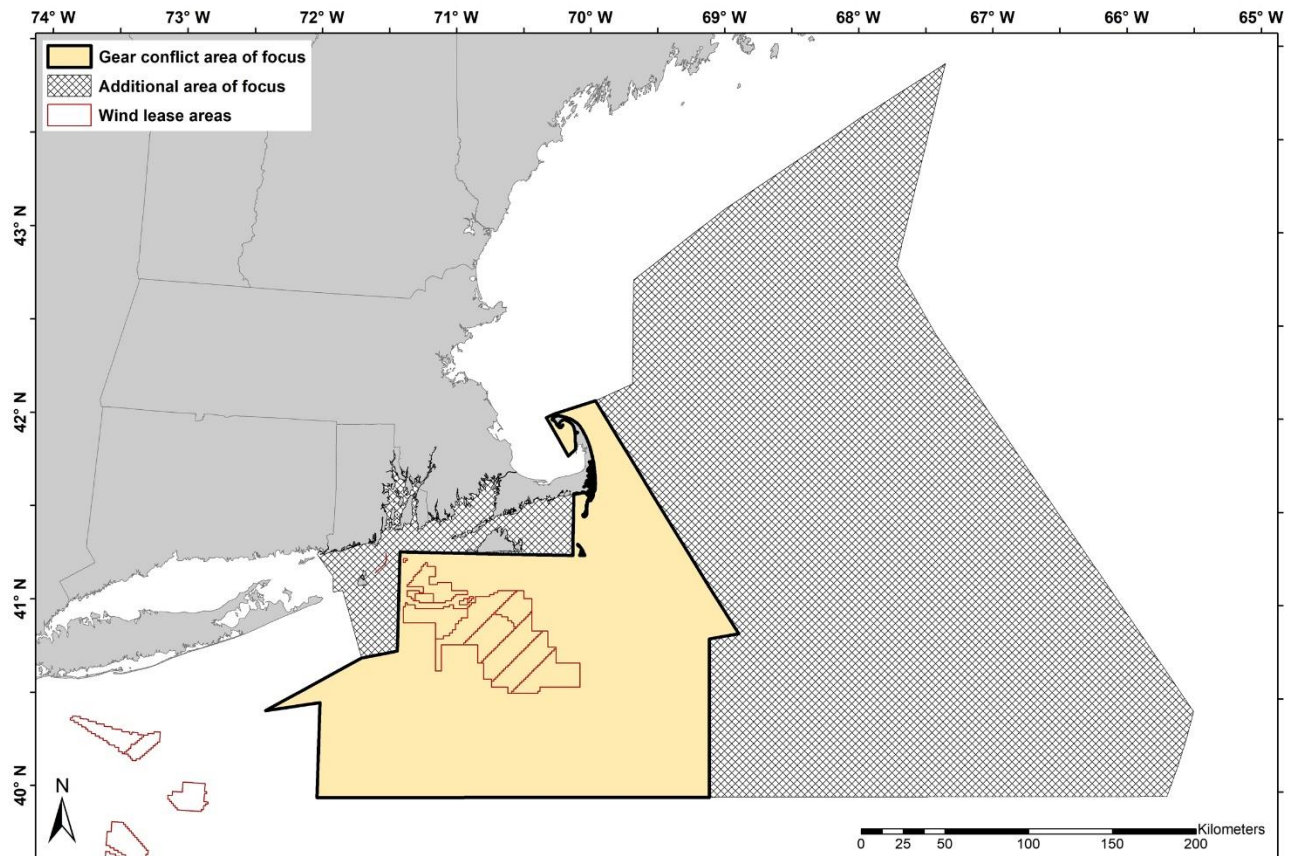


Figure 1. Project area of focus with Lobster Management Areas in Southern New England waters and north and east across Georges Bank and into the Gulf of Maine. The main area of focus includes the wind lease areas south of Massachusetts and Rhode Island.

Interview strategy and questions

At the start of each interview, participants were read or given a summary of the project goals and information about the funding for the project as part of the informed consent statement (**Table 3**). This statement also explained that participation was entirely voluntary, and all responses would be anonymous, with answers attributed to fixed- or mobile-gear fishermen. Fishermen were also told that any details about fishing locations would be generalized based on responses from multiple fishermen, with no specific details included in the report about locations where individual fishermen reported that they fished. All fishermen agreed to allow use of their quoted responses as long as they were anonymous.

Semi-structured interviews were conducted based on a list of questions that were designed to collect the information needed to address the project objectives (**Table 4**). Fishermen were asked to share any knowledge they have of existing or past gear conflict and gear-setting agreements in the project area. They were also asked to share their ideas about ways to minimize gear conflict while significantly reducing the presence of vertical lines in the project area of focus. The interviews focused on reducing vertical line presence rather than reducing risk to NARWs to elicit answers that included solutions for reducing gear conflict under management scenarios that included but did not specify on-demand fishing.

Table 3. Informed consent statement

The purpose of this project is to use the expert knowledge of commercial fishermen to offer potential solutions for minimizing gear conflict if on-demand ropeless fishing is adopted as a strategy to reduce fishery impacts on right whales. Coonamessett Farm Foundation is doing this work under a contract through NOAA Fisheries, but our role is to document and share the ideas and concerns of commercial fishermen.

No personal information will be shared in the project final report. Answers will be attributed to a “fixed-gear fisherman” or “mobile-gear fisherman”. Any figures or maps used to clarify gear conflict relationships will be generalized to remove any information that could be attributed to an individual or business.

Participation in this discussion is entirely voluntary and you can withdraw at any time.

Rapid Rural Appraisal methods were used because they can be much more rapid and effective for collecting information than traditional questionnaires (Chambers 1981), and strategies for utilizing these methods have been developed specifically for collecting information for fisheries management (Pido et al. 1996, Townsley 1993). The questions were used to guide the interviews, but a flexible approach was used to allow participants to expand on topics of greater interest or concern. Additional questions were asked about gear loss, storm impacts, and impacts from offshore wind farms when appropriate (blue cells in **Table 4**). Interviews were conducted in person or over the phone, and interview lengths ranged from under an hour to multiple hours over multiple days. Two interviews took place with more than one fisherman present at the interview.

Fishermen were also shown a series of fishing effort maps based on Vessel Trip Report (VTR) data for 2018 (Benjamin et al. 2018, **Appendix B**). At the start of the project, CFF reached out to staff at the Greater Atlantic Regional Fisheries office (GARFO) Analysis and Program Support Division and staff at the NEFSC who are working on fishing footprint maps and the Right Whale Decision Support Tool. All NOAA Fisheries staff who responded recommended using the fishing footprint maps (Benjamin et al. 2018) because other maps were not available across the range of fisheries the project included. These maps are generated by fishery based on the probability of a fishing haul occurring with a given distance from a reported VTR location (DePiper 2014).

Additional maps with the project area of focus overlaid on a navigational chart were used to solicit information about locations where fishing effort was concentrated or gear conflict was common (**Figure 2**). These maps were laminated, and fishermen were invited to draw on these maps using dry-erase markers. Photos were collected after drawings were complete, and the maps were cleaned of any personal information before the next interview. Some fishermen also chose to share data from the chart plotters on their vessels, and this information was summarized by the person conducting the interview. When interviews were conducted over the phone, copies of the maps were emailed to the participating fisherman or follow-up interviews were conducted in person at a later date.

Table 4. Interview questions. Questions highlighted in blue were added to gain additional information outside of the scope of this project.

Are you a mobile gear or fixed gear fisherman? What other details are you willing to share about your background and experience as a commercial fisherman?
Do you have any experience with informal gear conflict agreements? Can you share some details and did the agreement(s) work?
What are your concerns with ropeless gear and gear interactions if the number of vertical lines in the water must be reduced by 90% or more? What specific concerns are you most worried about?
How often do you (or anyone that you've heard) overlay gears?
Do you have any ideas for solutions that could minimize these gear conflicts (if the number of vertical lines in the water must be reduced by 90% or more)?
How will ropeless fishing affect small boats vs large boats?
If ropeless or on-demand gear were to be mandated, how would that affect gear loss? Are you concerned about storms affecting ropeless gear?
How much gear loss is attributed to storms? If storms become more frequent, do you think you'll lose more gear?
For fixed gear fishermen – How much gear do you lose annually?
For mobile gear fishermen -- How much fixed gear do you pull up annually?
Have you historically fished within wind farm footprints? If yes, what will you do when wind farms are put up?

Aggregation of responses based on type of fishery

Participant responses to questions about reducing gear conflict were aggregated based on the type of fishery participated in by each fisherman, with answers categorized as from a fixed gear fisherman, a mobile gear fisherman, or a fisherman with experience in both types of fisheries. Participant concerns about on-demand gear in general, fixed-gear loss, and the impacts of storms and wind farms were also aggregated based on the same three fisherman categories (**Appendix B**).

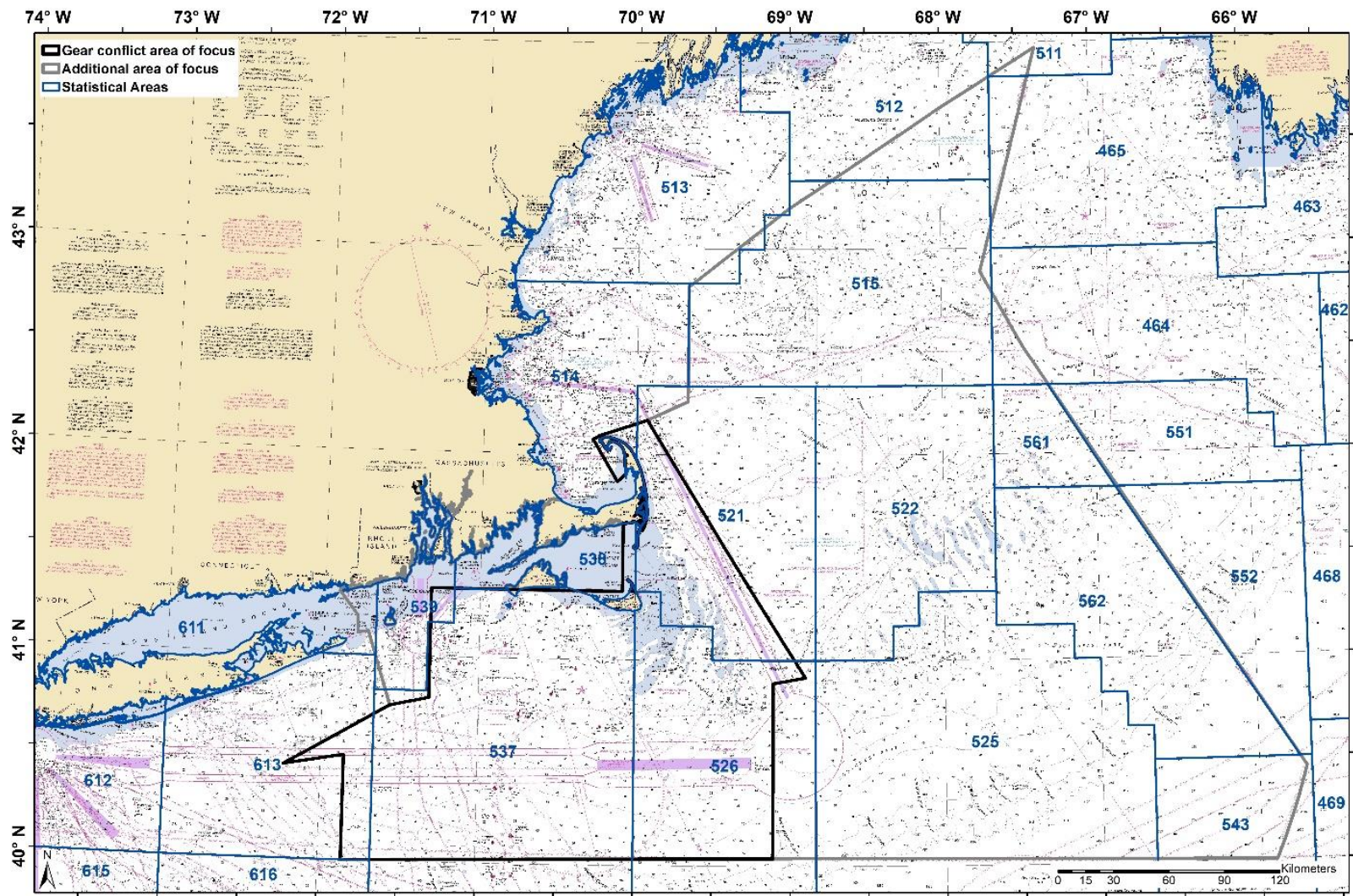


Figure 2. Navigational chart with fisheries Statistical Areas and the project areas of focus.

Project Results

Results by project objective are summarized below. A summary of results not directly applicable to project objectives, including concerns about on-demand gear that are not related to gear conflict, loss of fixed gear, and impacts from wind farms are included as **Appendix C**.

Maps of fishing effort by fishery

The first project objective was to determine if currently available maps of fishing effort by fishery agree with patterns of monthly and/or seasonal effort that are known to fishermen. Fishermen who viewed the project effort maps (**Appendix B**) did not state that any of the maps were incorrect overall, but this assessment was qualified in some cases with suggestions for improvements or concerns. Multiple interviewed fishermen pointed out that fishing effort can shift year to year. Some suggested looking at effort averaged over a decade or more. However, others stated that they were concerned that older effort maps might be incorrect due to climate change and shifts in species distributions. As a result, they pointed out that historical fishing effort may no longer be relevant.

Some fishermen noted that in some areas like Long Island Sound at the outer edge of the modeled area, effort shown on the maps was likely incorrect. Based on how maps like these are generated using geostatistical models ([DePiper 2014](#)), these edge areas may be biased and show incorrect levels of effort due to spread at the edges of the modeled area. This should be considered when using effort maps generated using geostatistical models for management decisions.

Locations with fishing effort by species

Although fishermen were asked about where they fished, only five fishermen highlighted specific locations on the maps, and these areas were well-known locations. Some of the interviewed fishermen also highlighted areas where other fisheries occurred. As a result, the fishing effort map shown as **Figure 3** is not comprehensive, but it includes some discrete areas where fishing occurs for specific species. As a proxy for where the scallop fishery operates, the Scallop Area Management Simulator (SAMS) areas that are open to fishing as open bottom or rotational fishing areas are also included in **Figure 3**.

Locations where gear conflict is common

When asked about areas where gear conflict is common, participating fishermen answered with entire statistical areas, geographical areas (e.g., Crab Ledge, Great South Channel, south of Block Island), or by drawing polygons on supplied maps. In cases where polygons drawn by multiple fishermen overlapped, they were joined to form the polygons shown in **Figure 4**. In total, interviewed fishermen indicated that 69% of the project areas of focus had high levels of gear conflict between mobile- and fixed-gear fisheries.

Areas where gear conflict is common included locations where fishing was allowed under the FMPs for each fishery. Yet gear conflict was also common in areas where fishing by mobile-gear fishermen, particularly scallopers, did not occur except during research trips permitted under Letters

of Authorization (LOAs) or Exempted Fishing Permits (EFPs). This issue was of particular concern to offshore lobstermen who fished on the eastern side of Georges Bank in Closed Area II (CAII) N because they expected to not have conflicts with scallop dredges in this area. CAII S and CAII-Extension immediately to the south are rotational fishing access areas for the scallop fishery, and lobstermen expect to interact with mobile gear only when these areas are open. Scallop research trips in these areas when they are closed through the rotational access program also led to unexpected gear conflicts.

Fixed-gear fishermen pointed out that gear conflict often occurs when mobile-gear fishermen are looking for new areas to fish. These mobile-gear fishermen are often not familiar with the agreements or traditions in place in the new area.

Always a risk of interaction when mobile guys “take a sniff” meaning they do a couple test tows to see what the area is like.

Fixed-gear fisherman

Fixed-gear fishermen were asked about gear conflict between fixed-gear fishermen, including a question about how frequently gear overlay occurs. Most participating fixed-gear fishermen stated that gear overlay is uncommon overall. When it happens, it is often in areas with high densities of lobsters. Some noted that gear overlay was a significant problem previously when the lobster fleet was larger. Others believed it was still common, but not in their fishery.

That varies depending on how congested the lobsters are. If in a narrow area, coming out of Gloucester or Boston Harbor for example, overlay will happen a lot vs when lobsters move offshore and there's more space. Then it will seldom happen.

Fixed-gear fisherman

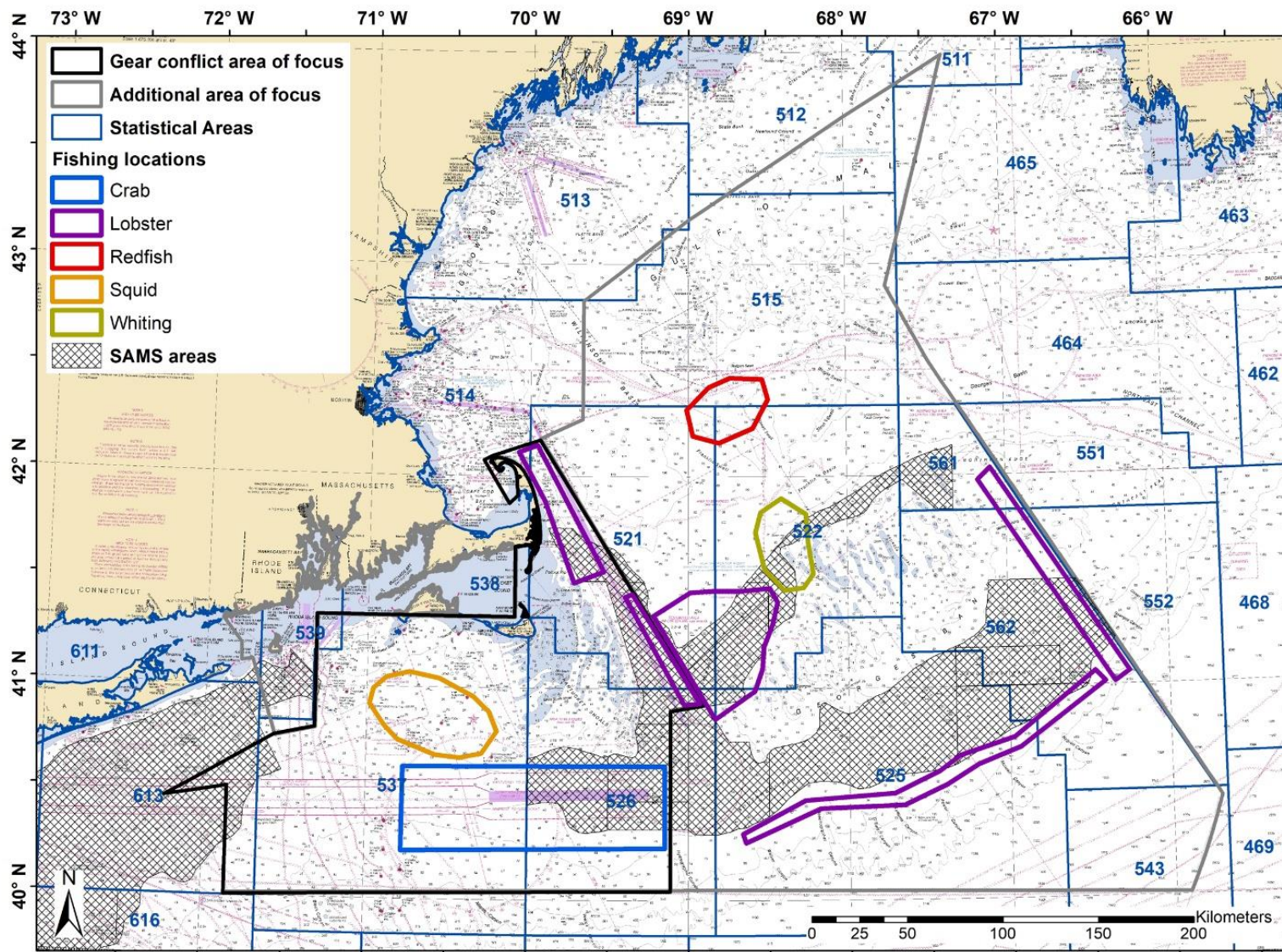


Figure 3. Locations of areas where fishing effort is concentrated for some species, as reported by fishermen who participated in the interviews. These areas are overlaid on the SAMS areas where scallop fishing effort is concentrated.

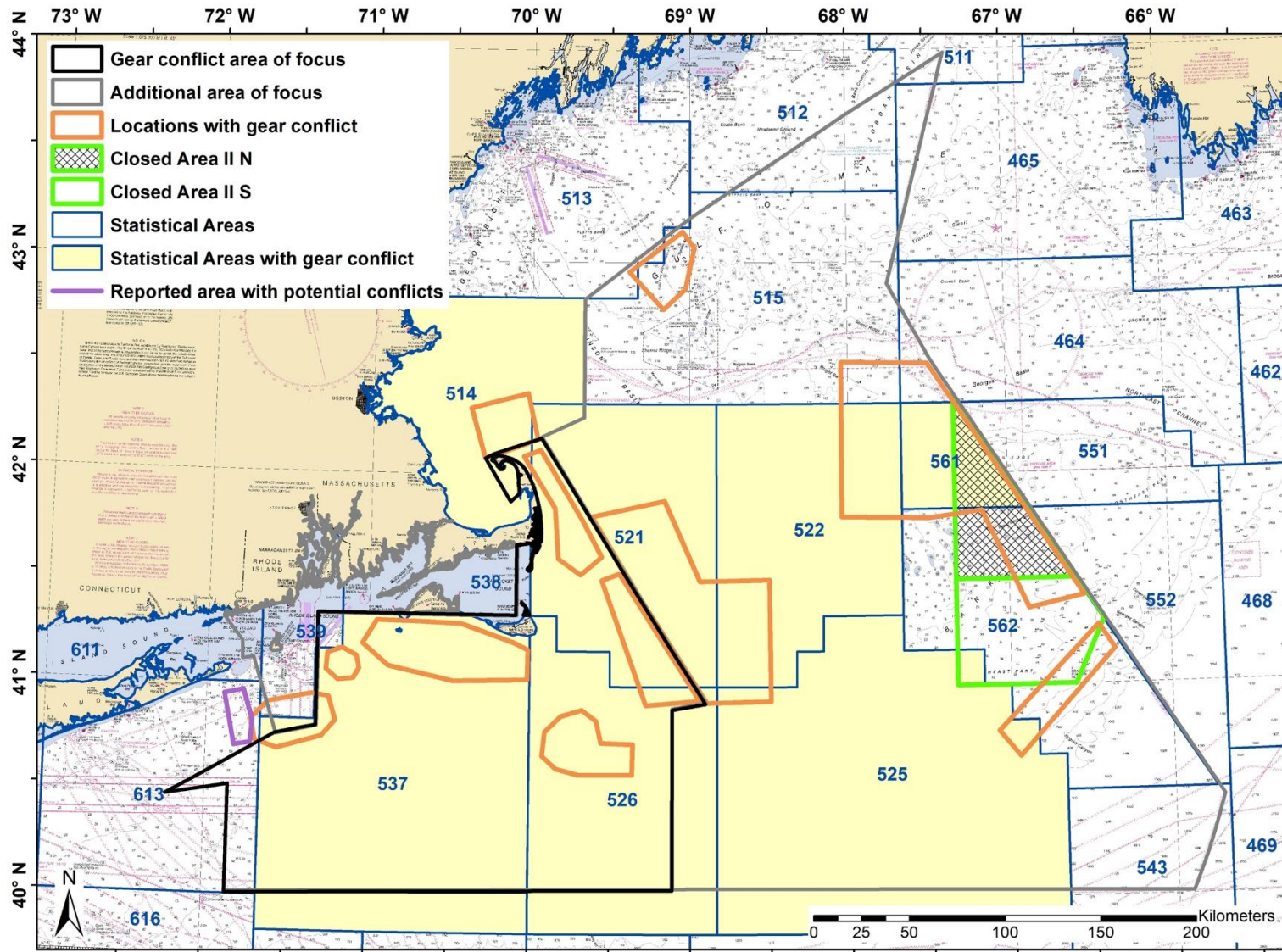


Figure 4. Statistical Areas and specific locations where gear conflict between fixed- and mobile-gear fishermen is common based on reports from fishermen who participated in the interviews. CAII, the groundfish closure on eastern Georges Bank, is an area with gear conflict even though fishing with mobile gear is not permitted without an LOA or EFP. An area where gear conflict in LMA4 has been reported to the NEFMC and shared with fishermen through NOAA Fisheries bulletins is also included in the map.

Gear conflict agreements

Fishermen were asked to share any knowledge they have of existing or past gear conflict and gear-setting agreements in the project area. Answers often included details about how these agreements were reached, which fisheries were involved, and how they were communicated to members of the impacted fisheries. Their answers included details about time-area closures in existing regulations and informal agreements.

Fishermen were not specifically asked, for example, if they made temporary agreements over the radio or abided by historical agreements. Therefore, any lack of mention of an agreement type does not imply that they do not use this method to deal with gear conflict.

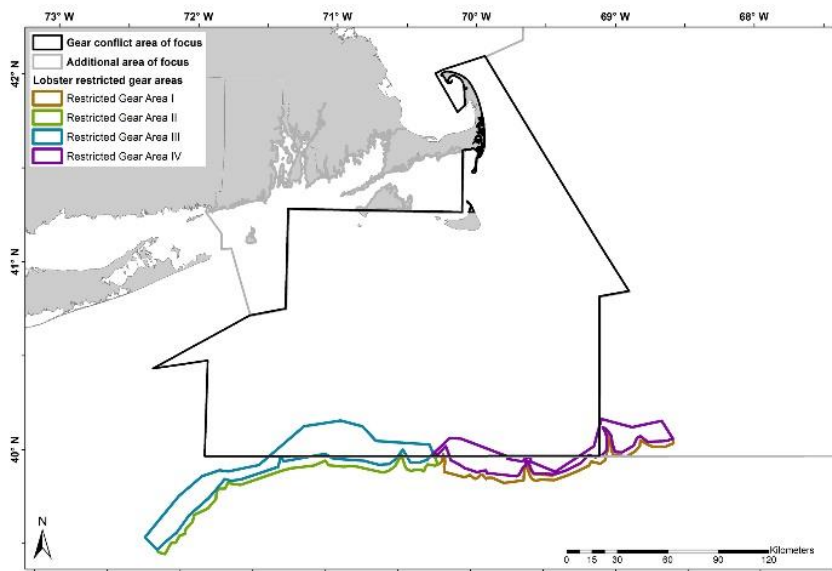
Time-area closures in existing regulations

Multiple fishermen mentioned the seasonal Restricted Gear Areas from the 70 to 200-fathom lines south of Rhode Island and Massachusetts in waters east of Hudson Canyon (**Figure 5**). These seasonal time-area closures were enacted in response to gear conflict between the lobster fishery that historically existed in this area and a deepwater monkfish fishery that moved into same area starting in 1991-1992 ([NEFMC 1996](#)). Adherence to these closures started as a gentlemen's agreement based on over a year of negotiations, but as fishery resources shifted, gear conflict increased to even higher levels in 1994-1995. As a result, these time-area closures were incorporated into the NOAA Fisheries final rule covering regulations to manage the American lobster fishery in the Exclusive Economic Zone (EEZ) from Maine through North Carolina ([64 FR 68248](#)). During a meeting of the Atlantic Lobster Management Board in 2009, these time-area closures were described as a "perfect compromise" because both sides involved in the conflict were unhappy with the outcome ([ASFMC 2009](#)).

According to fishermen participating in these interviews, there are upwards of 4,000 traps in Restricted Areas I and IV (**Figure 5**). When commenting on these seasonal restricted areas, lobstermen expressed frustration that they did not have a grace period once Restricted Areas I and II closed to fixed gear on June 16th. Vessels towing mobile gear, particularly those targeting shortfin squid (*Illex illecebrosus*), would tow through their gear if it was still in these areas. Mobile gear fishermen targeting *Illex* had the opposite comments, stating that they pulled up fixed gear when it should not have been present in the area.

I have no issue moving fixed gear – give me a day or something to move out of here so I don't lose gear.

Fixed-gear fisherman



Restricted Gear Area	Area Closed to Mobile Gear	Area Closed to Lobster Fixed Gear
I	Oct 1-Jun 15	Jun 16-Sep 30
II	Nov 27-Jun 15	Jun 16-Nov 26
III	Jun 16-Nov 26	Jan 1-Apr 30
IV	Jun 16-Sep 30	N/A

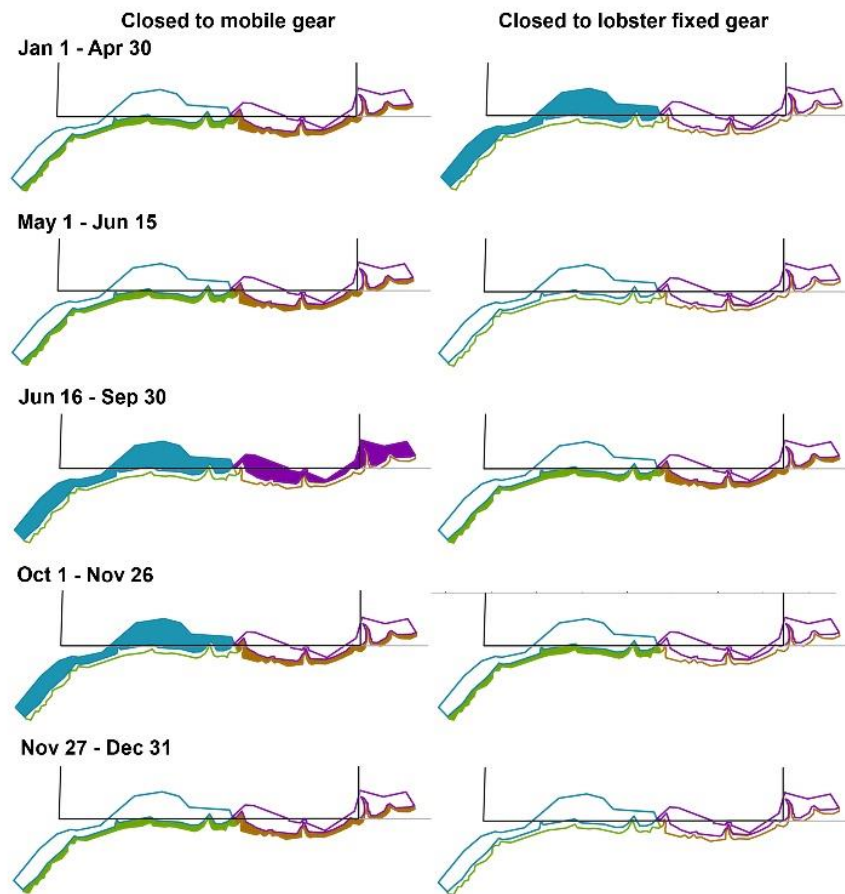


Figure 5. Seasonal lobster and mobile gear restricted areas south of RI and MA centered on the 50-fathom line.

Informal gear conflict agreements

Informal gear conflict agreements were commonly cited, including historical/verbal agreements that certain fisheries use certain areas, historical agreements based on fishing along Loran lines, and temporary agreements reached over the radio during fishing trips. These informal agreements were cited more frequently than the existing seasonal Restricted Gear Areas described above (**Figure 6**).

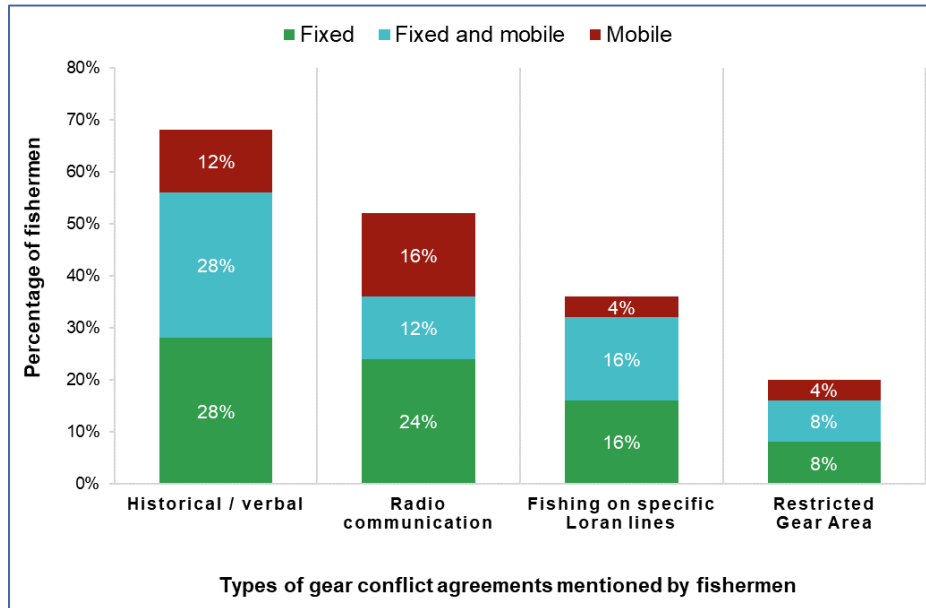


Figure 6. Informal and formal gear conflict agreements mentioned by participating fishermen.

A common opinion among the interviewed fishermen was that informal gear conflict agreements work if everyone chooses to participate. Frustrations with those who do not was expressed more frequently by fixed-gear fishermen who lose gear when conflicts occur. Fishermen acknowledged that shifting distributions of fish can lead to the breakdown of informal gear conflict agreements.

Verbal agreements between mobile and fixed work until something changes. Mobile guys say they won't tow west of the 150 line, but if fish start showing up, they'll tow on fixed gear. And vice versa. It happens both ways.

Fixed-gear fisherman

Historical verbal agreements

Historical verbal agreements were mentioned by participants more than any other type of informal agreement. These agreements were based on defined regions or agreed upon directions and tracks for setting of fixed gear and/or towing of mobile gear. Many of these agreements were described as existing for decades. A common belief was that most of the gear conflicts in areas with existing verbal agreements were caused by fishermen who were new to the area and were therefore unaware of informal agreements that were in place. Intentional gear conflict caused by towing through fixed

gear did occur, but it was less common, and those who intentionally ignored historical agreements did not fish in an area for long.

There were informal gear conflict agreements because for roughly 30 years fishing communities were rather isolated in the sense that everyone engaged in the business knew each other for the most part which made it easy to resolve issues in port. These were referred to as “windy day conversations”.

Mobile-gear fisherman

Mobile gears stick with regular tows and those are well-known to fixed gear guys so if there’s interaction it’s probably coming from a new guy who doesn’t know that’s where the mobile tracks are, or it’s someone who doesn’t care and will fish there anyway, but if that’s the case then they don’t stay fishing for very long.

Mobile-gear fisherman

Fishing on Loran lines as an example of a historic verbal agreement

Fishing on Loran lines, specifically fishing on “the 5’s and 0’s”, is an historical agreement described by multiple fixed- and mobile-gear fishermen. Fixed gear is set on the Loran lines that end in 0 and 5 in an agreed upon direction (e.g., E-W), leaving a track in between the fixed gear for mobile gear to be towed. In the areas where this agreement is followed, fixed gear placed on the 5’s and 0’s is typically 2-2.5 km apart, leaving enough room for vessels hauling mobile gear to turn around.

This type of agreement can be problematic. Fishermen reported that gear overlays could occur when multiple fixed-gear fishermen in an area followed this agreement and tried to lay their gear in close proximity. They also reported that mobile gear could take out fixed gear along multiple Loran lines if the agreement was not followed.

Setting on the 5’s and 0’s works to a point – all fixed gear sets on the 5’s and 0’s and sometimes those gears overlay each other.

Fixed-gear fisherman

Verbal agreement is supposed to be lobstermen on the 5’s and 0’s, but the mobile guy was on the 25000* line and hit me four times.

Fixed-gear fisherman

* The 25000 line is not one of lines that run E-W in the area and therefore cuts across the 5’s and 0’s

Temporary agreements based on radio communications

Temporary agreements based on radio communications were the second most mentioned gear conflict agreements (**Figure 6**). More than half of the fixed-gear fishermen stated that they asked permission of mobile-gear fishermen to put traps or nets in an area, and this was a way to avoid losing traps and triggering confrontations or gear conflicts. One fisherman noted that cell phones have made this type of informal agreement less hostile because discussions can be held in private.

I have been asking draggers for permission to be in an area so we can coexist – less confrontation, less conflict. I try to cater to them as much as possible.

Fixed-gear fisherman

Ideas for reducing gear conflict if vertical lines are reduced by 90% or more

Fishermen were asked to share their ideas about ways to minimize gear conflict while significantly reducing the presence of vertical lines in the project area of focus. In almost all cases (96% of fisherman who answered this question), the interviewed fishermen assumed this line reduction would be accomplished through on-demand fishing although this was not explicitly stated. The solutions suggested by participants could be grouped into the categories below, in order of overall frequency of the response (**Figure 7**):

- 1) Improving technology
- 2) Creating time-area closures for different gear types
- 3) Reducing the number of permitted traps
- 4) Using hybrid trawls (on-demand combined with traditional buoys) or single endlines
- 5) Offering more training for fixed- and mobile-gear fishermen
- 6) Offering portals where fishermen can voluntarily share the locations where they fish
- 7) Fishing along lines (in agreed-upon directions)

More than one fisherman suggested using Automatic Identification System (AIS) devices to mark fishing gear as a solution to gear conflict. Some vessels fishing for highly migratory species put AIS trackers on their longline strings, and these devices show up on the AIS systems required for larger fishing vessels. However, as of writing this report, the use of AIS devices to mark fishing gear is still not permitted by the Federal Communications Commission (FCC). A 2021 proposed rule to authorize the use of AIS devices to mark fishing gear is still under consideration ([FCC 2021](#)). The use of AIS trackers on fishing gear can result in monetary penalties from the Enforcement Bureau of the FCC.

Some of the participating fishermen were not willing to offer solutions because they strongly believed that on-demand fishing should not be permitted. Some of these fishermen also believed that the NARW is not critically endangered and the majority of NARW deaths are caused by vessel strikes, negating any need for on-demand fishing. Others did not offer any solutions because none came to mind during the interviews.

All of the ideas for reducing gear conflict that involved reducing the presence of vertical lines in the water – including closures, trap reductions, use of hybrid trawls, and trawling up – can be modeled using the DST. These ideas have been included in management scenario packages submitted by caucuses within the ATWTRT.

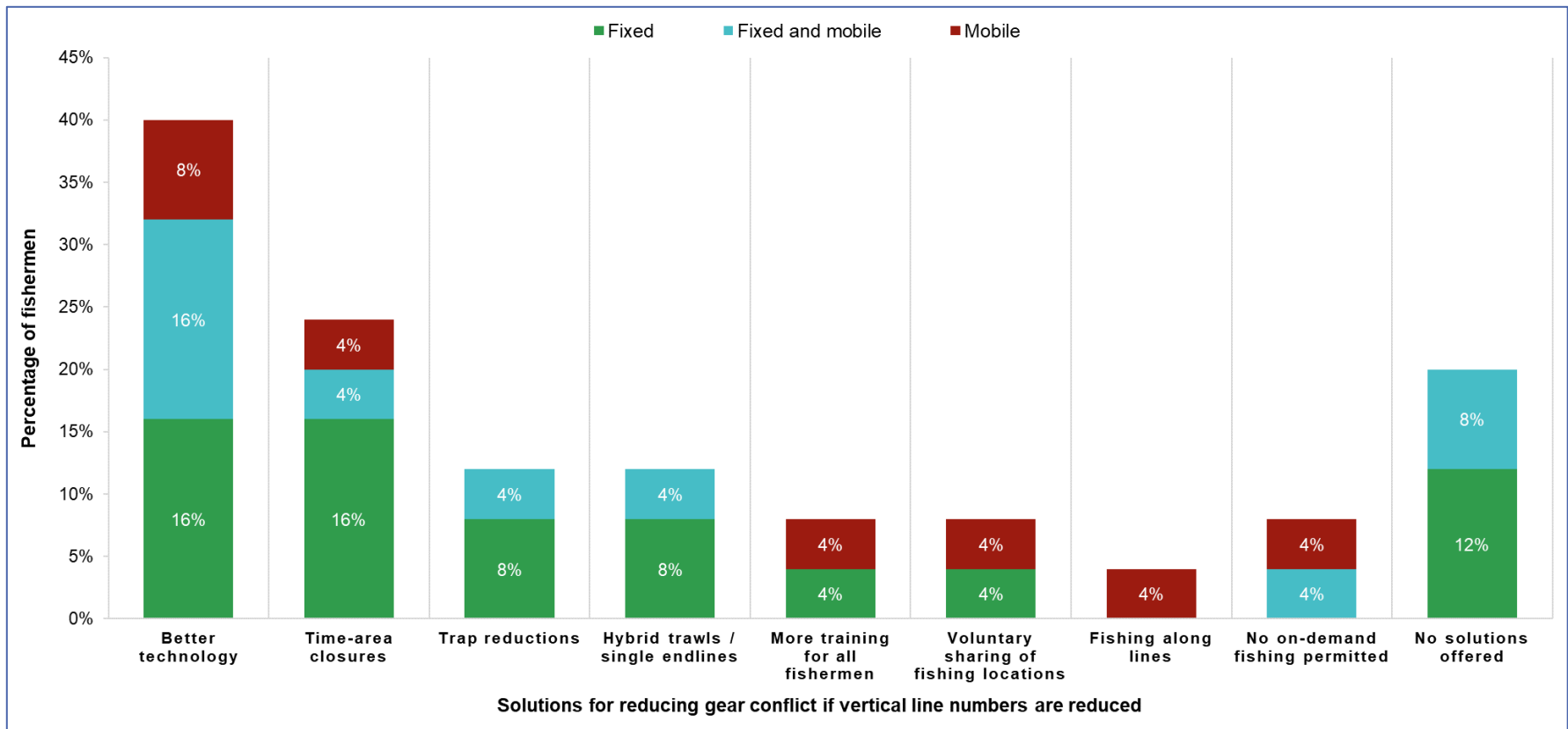


Figure 7. Ideas shared by fishermen for reducing gear conflict if vertical lines are reduced by 90% or more. Note that almost all of the interviewed fishermen assumed this would occur through adoption of on-demand fishing.

Technology improvements

None of the participants believed that currently available on-demand fishing technologies would work on a commercial scale. Forty percent of the fishermen who suggested options for reducing gear conflict if on-demand fishing was adopted believed that improvement to the technology could reduce gear conflict. The technology improvements they recommended included improvements to equipment and software.

The currently available apps for tracking deployed on-demand gear were disliked by all who were interviewed. The apps were described as confusing and unreliable. One fisherman stated that the apps need to be “idiot-proof” before they could be successfully used at a commercial scale. All agreed that fishermen needed to see the locations of gear from all manufacturers on the same interface. Multiple fishermen suggested that incorporating an alarm into the software to warn mobile-gear fishermen of traps in their vicinity would be a useful addition to reduce gear conflict. Ideally, the same alarm would also be sent to the fixed-gear owner. Integrating on-demand gear locations into existing chart plotter data streams was also suggested by more than one participant.

The need for gear locations to be updated in real time with no delays after deployment was mentioned by fixed- and mobile-gear fishermen. All recognized that this would require satellite internet on all boats and real-time updates between cloud storage providers. Without satellite internet, fishermen using on-demand gear outside of cellphone range cannot update their gear locations or see new locations of gear belonging to other fishermen without heading inshore.

With ropeless fishing gear, if a vessel is out fishing for 14 days and moves gear and I leave 2 days before the end of their trip, how will my vessel receive the updates when we are offshore? Satellite is very expensive and also I'm relying on the lobster boats to update their systems and ensure that gear movement was uploaded correctly. The technology is not there yet so why force fishermen to adjust operations when it will cause more problems?

Fixed-gear fisherman

Communication between on-demand traps, deck boxes, and the tablets or phones with the manufacturer software is currently through Bluetooth, and multiple fishermen mentioned issues with Bluetooth connectivity when using on-demand gear. They suggested that an alternative to Bluetooth was needed to reliably operate the systems.

Time-area closures

Time-area closures were suggested primarily by fixed-gear fishermen. One mobile-gear fishermen mentioned time-area closures because he believed this was the only way on-demand gear could be used at a commercial scale, but he did not want to see any new closures implemented. There was concern that continuing to subdivide the ocean and allocate seasonal access to different groups was not viable and could be biased.

Solutions to problems, at this point closing off giant parts of the ocean and allocating to different user groups, isn't viable and may not be legal. Whole can of worms right there. Some user groups have bigger pockets.

Fixed-gear fisherman

Reduction in trap numbers

Trap reductions were suggested by a few fixed-gear fishermen. In all cases, they believed these reductions should be implemented gradually. One fisherman suggested that the best way to reduce trap numbers was by setting caps as licenses were transferred, often from older fishermen who set fewer traps to younger fishermen who will fish the maximum number of traps permitted under the license.

When someone exits the fishery, that license transfer should be capped. In my decades of experience with fishing, the lobstermen as they get older will fish fewer and fewer traps because they can't keep up with the labor and they get tired. They reduce the amount of traps they fish and when they retire out of the fishery and that license is transferred over to a young, new lobstermen, they tend to be more ambitious and will eventually increase the amount of traps they are fishing. So cap and you'll have younger people who can operate their own boats and maintain their own gear with lower overall expenses of bait and crew – resulting in less gear conflict.

Fixed-gear fisherman

Hybrid trawls

A few fishermen suggested the use of hybrid trawls or single endlines as a practical method reducing gear conflict. The use of hybrid trawls or single endlines would reduce the number of vertical lines in the water and the presence of surface gear that can get snagged by mobile vessels (e.g., by the birds on a scallop vessel).

More training for fixed- and mobile-gear fishermen

This suggestion was closely linked to improving technology, but it was explicitly mentioned by some fishermen. They emphasized that both fixed- and mobile-gear fishermen would need training to become comfortable operating on-demand systems.

There is a learning curve to this whole process. Everyone needs to be on same page with a universal app, universal communication, and universal training for each fishery.

Fixed- and mobile-gear fisherman

Voluntary sharing of fishing locations

A couple of fishermen suggested creating a website or social media site for fishermen to voluntarily share information about their fishing activities. With sufficient buy-in and cooperation from fishing communities, this system could reduce gear conflict.

Have a website where everyone puts their information in for their tows/hauls and people know which areas to avoid – and fishermen update this daily. Or have people input their historical fishing efforts, like history of their VMS logs so others can see the months they're active and know to move gear out of a certain area when a month approaches. Everyone can stay out of each other's way.

Fixed- and mobile-gear fisherman

Create a platform, like a Facebook page with a plotter for fishing communities to engage, share, and relay information.

Mobile-gear fisherman.

Fishing along lines

One fisherman suggested requiring fixed-gear sets to run in one direction (e.g., all set east to west). Mobile gear would also be towed along the same lines. This requirement would be similar to existing informal agreements for fishing on specified Loran lines.

Concerns of fishermen about on-demand fishing impacts on gear conflict

Participating fishermen had many concerns about on-demand fishing (**Figure 8**), and their concerns related to gear conflict are described below. Additional concerns are included in **Appendix C**.

More than half of the participating fishermen were concerned about how mobile-gear fishermen would know where on-demand gear was located. This concern was linked to comments about the need for real-time accurate gear locations to be easily shared across all fisheries operating in an area. A couple of mobile-gear fishermen stated that they would need to know where fixed gear is located at distances greater than the 2-5 miles currently being used by many manufacturers.

Knowing when I'm a few miles away from it isn't good enough because sometimes my tows are 10 miles long – knowing where their gear is will be very critical for us to make a tow in the area.

Fixed- and mobile-gear fisherman

Opinions varied about the reliability of the on-demand equipment. One fisherman described the systems as flawless, but multiple fishermen were concerned about the reliability of the systems in anything but ideal sea conditions. There was concern that the gear would not work in areas with high trap densities, and grappling in these areas to retrieve gear was not easy to do.

There's more effort in certain areas and grappling can actually grab someone else's gear.

Fixed- and mobile-gear fisherman

More than one fisherman mentioned concerns about faked on-demand gear locations being used to reserve spots because gear locations are reported manually by users. This could result in more gear conflict if the locations could not be trusted as accurate and would therefore be ignored. Other

fishermen who used mobile gear were concerned about increased gear conflict if on-demand gear was used in areas that are not traditionally used for fixed gear.

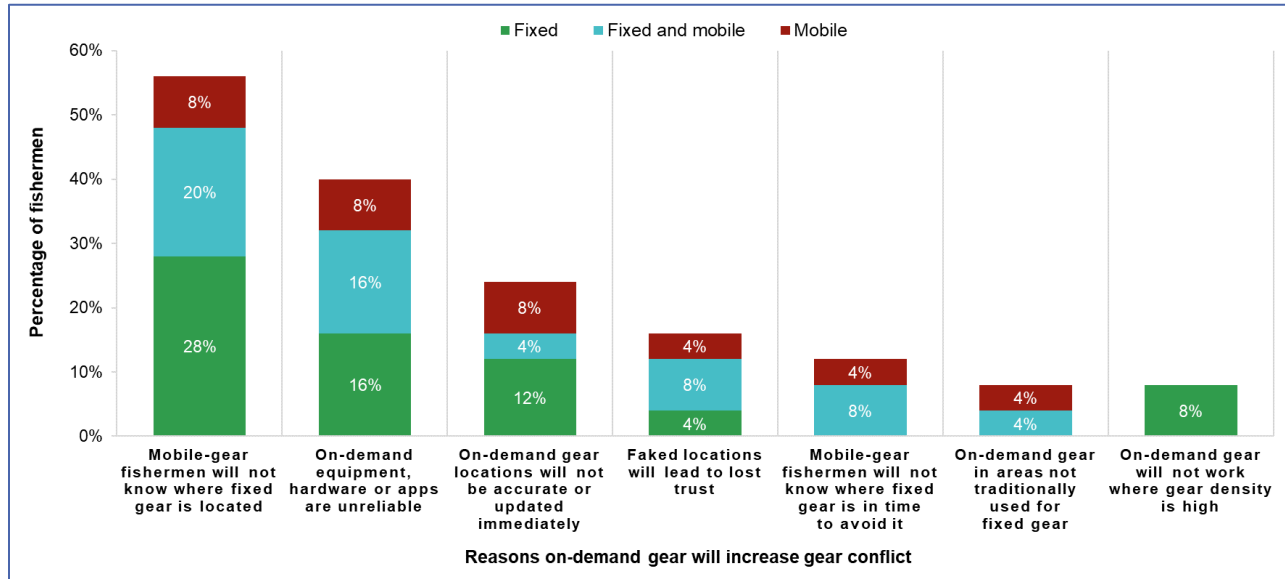


Figure 8. Reasons that participating fishermen thought on-demand fishing could increase gear conflict.

Conclusions

All of the fixed-gear fishermen who were interviewed for this project seemed resigned to NOAA Fisheries requiring them to fish with on-demand gear. Mobile-gear fishermen seemed equally convinced that they would be required to adapt to the presence of on-demand gear, and they hoped this would not lead to more closures or loss of fishing grounds if on-demand gear could be used in areas that have been historically free of fixed gear. All participants believed that currently available on-demand equipment and software would not work on a commercial scale. They cited previous management efforts that failed to work as intended, from weak links to groundfish catch shares, and expressed frustration that their concerns were not adequately heeded in the past.

Exactly like the catch share [program] – everyone raised alarms, but heads down when money is there and look at our fisheries now.

Fixed-gear fisherman

Many of the gear conflict solutions suggested by participating fishermen were mentioned or discussed in the 1996 gear conflict amendment (NEFMC 1996), highlighting the fact that gear conflict is and has been a persistent issue for commercial fisheries. The framework process laid out in the amendment is still applicable today, and it offers an expedited process to adjust frameworks and tackle gear conflict issues. Technology may offer some new solutions to minimize conflict, but requiring all commercial fishermen to purchase new fishing gear or upgrade their vessels with new equipment or satellite internet may not be financially feasible, even with government subsidies.

This is a common problem that the government creates. They have meaningful intentions or for the most part try to implement new tools but they don't have the resources to effectively test the applicability of new technology. They outsource to contractors. In the long run, vessels will be charged subscription fees, the computer program will go down or there will be maintenance issues; gear will be towed up or lost.

Mobile- and fixed-gear fisherman

Some fishermen were hopeful that advances in technology and gear incentives could make the use of on-demand gear feasible. This would require accurate and real-time gear locations, and widespread training of fixed- and mobile-gear fishermen. There would be a learning curve as fishermen learned to adapt to a new way of fishing. The hope of the older fishermen was that the younger generation could embrace these new technologies, allowing their fisheries to survive.

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Appendix A – Case Study of Gear Conflict Response

The inserted documents highlight a recent example of a gear conflict response by the NEFMC and NOAA Fisheries. The bulletin sent by NOAA Fisheries and the letter sent to the NEFMC by a fixed-gear fisherman are included.



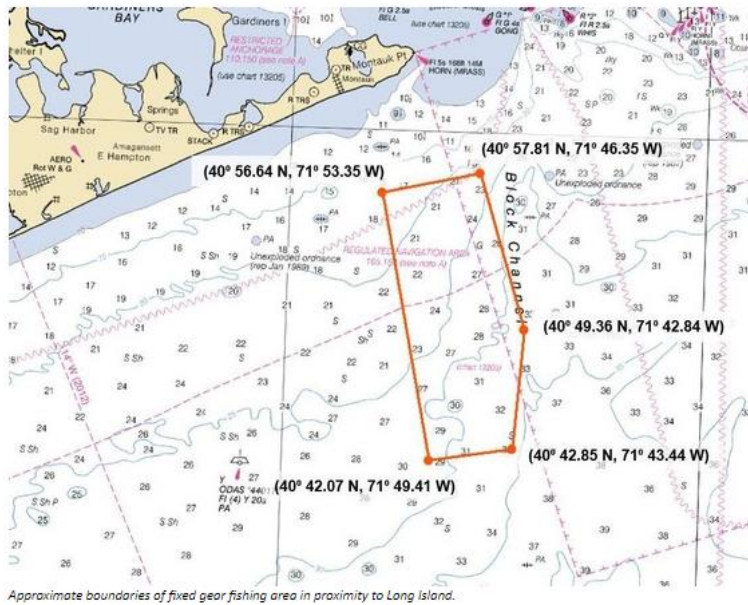
August 10, 2023

Potential Gear Conflicts in Lobster Area 4

The New England Fishery Management Council has received reports of gear conflicts between lobster fishermen and scallopers occurring south of Long Island, NY in Lobster Area 4 (see figure below).

Under the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. § 1857(1)(K), it is unlawful to remove, damage, or tamper with fishing gear owned by another person within the EEZ. Violations of the Act, including unlawful gear interaction, may result in civil penalties.

The lobster gear in this area is set east-to-west in 30-pot trawls and marked by highflyers. Gear is set starting in mid-July and fished through December. Gear is typically tended every seven nights. When fishing in this area, please be aware of the presence of fixed gear and tune your radar to be able to detect highflyers.



Questions?

Fishermen: Contact [Travis Ford](#), Regional Office, 978-281-9233 or [Caleb Gilbert](#), Office of Law Enforcement, 978-281-9338

Media: Contact [GARFO Public Affairs](#)

Figure A – 1. NOAA Fisheries bulletin.

Mr. Thomas Nies,
Executive Director,
New England Fishery Management Council,
50 Water Street, Mill 2,
Newburyport, MA 01950

September 19, 2020

Dear Mr. Nies:

My name is Vinny Damm. I am a lobster and monkfish fishermen from Montauk NY, and I have been a fisherman for close to 40 years. I have a crew of two plus myself that work on my boat, the FV Lady K. My son Brendan Damm, one of my crewmen, has been fishing full-time with me since graduation from SUNY-Plattsburgh three years ago. He originally contacted some people from National Marine Fisheries Service, and after a brief discussion they suggested I send a letter to the NEFMC.

I am writing to you today because of gear conflicts that are occurring with my traps with the scallop fleet in Lobster Management Area Four (LMA-4) in Southern New England, south of Montauk.

For the last twenty years my gear has been set in an area within LMA-4, one that is also an Open Access Area for the scallop fleet. We fish 30 pot trawls. I mark my gear correctly with metal highflyers that can easily be seen on radar. We begin setting gear the end of July and fish through December. When I set my gear, I try to turn it over on seven nights.

Occasional interactions began five years ago, but for the last three years, I have been continually losing more and more lobster traps to the scallop fleet. Last September, it began to worsen as almost two dozen scallop boats from New Bedford to Virginia showed up where I have set my traps for 20 years, fishing their open access days. After two weeks, I lost 300 traps.

This year, every week I go out, I lose more gear. A total of 75 traps completely gone so far, plus of those I've been able to grapple, another 25 that have been destroyed. This is happening not only where I've traditionally set my gear, but in other places where there has never been a conflict before. I've attached a rough map of the area that I fish, for your information.

My son and I have spoken to NEFSC staff and they suggested that I bring this issue to the Scallop Advisory Panel for further discussion. I would appreciate the advisory panel's time to discuss this matter at your meeting on Wednesday.

Sincerely,

A handwritten signature in black ink that reads "Vinny Damm". The signature is written in a cursive style with a long horizontal line extending to the right.

Vinny Damm
FV Lady K, Montauk NY
vinnydamm@optonline.net

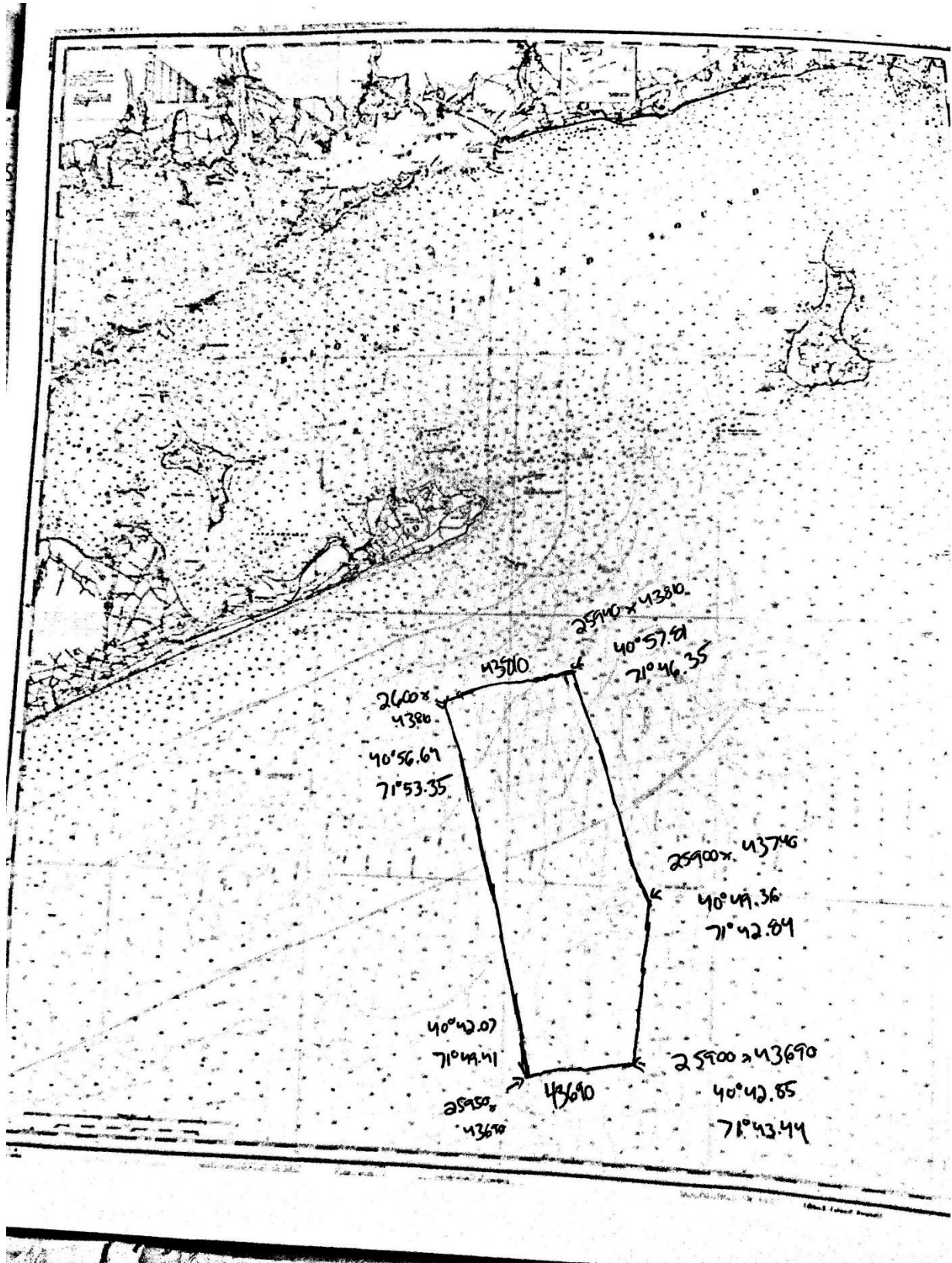


Figure A – 2. Letter to the NEFMC Scallop Advisory Panel.

Appendix B – Fishing Effort Maps

Fishing effort maps presented to fishermen were based on the revenue data used to generate the northeast fishing footprints at <https://www.fisheries.noaa.gov/resource/map/fishing-footprints-northeast> (Benjamin et al. 2018). The maps in Figures B – 1 to B – 16 are based on VTR data from 2018, the most recent year that was available. Fishing revenue rasters by year were supplied by Geret DePiper at the NEFSC upon request.

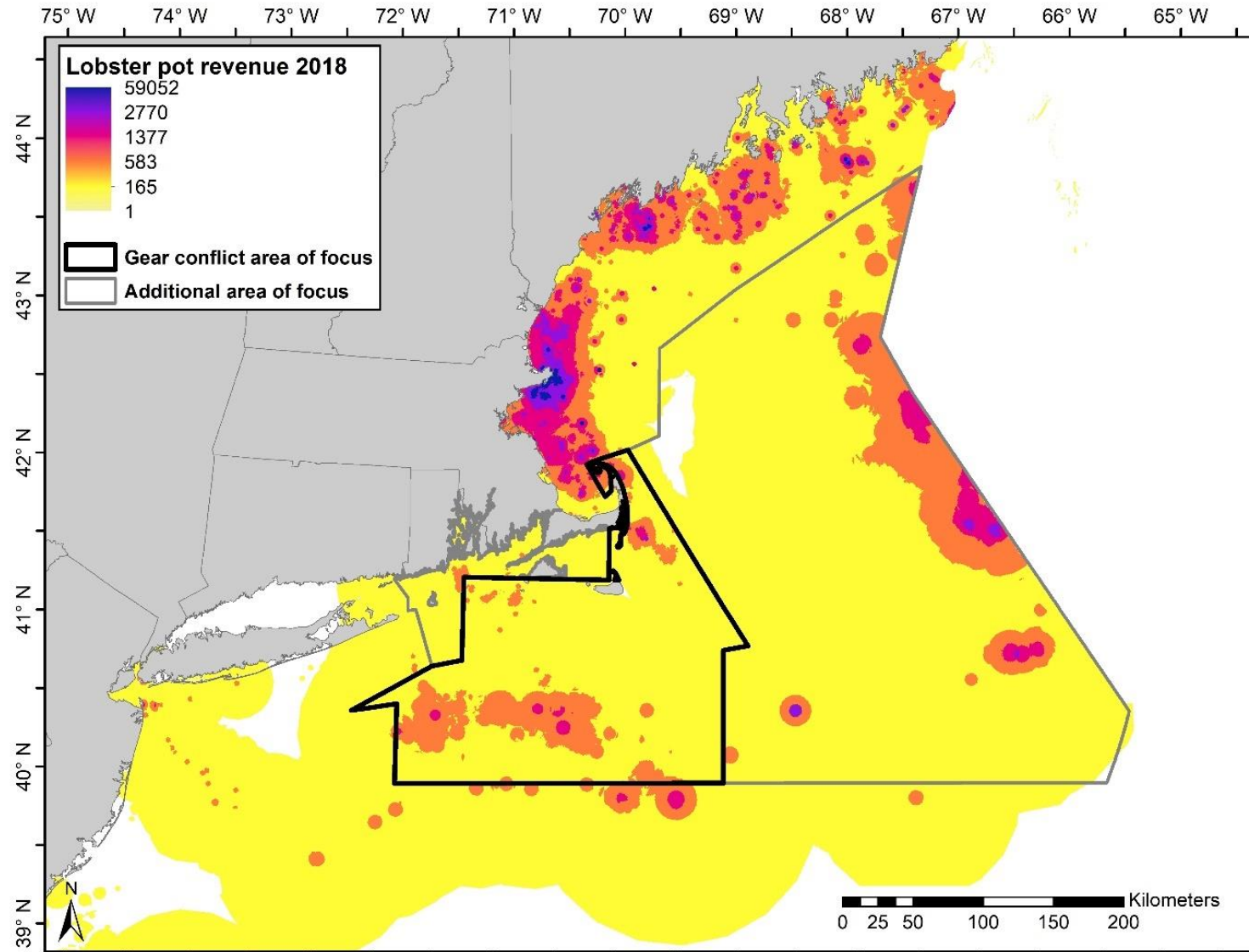


Figure B – 1. Lobster pot revenue in 2018.

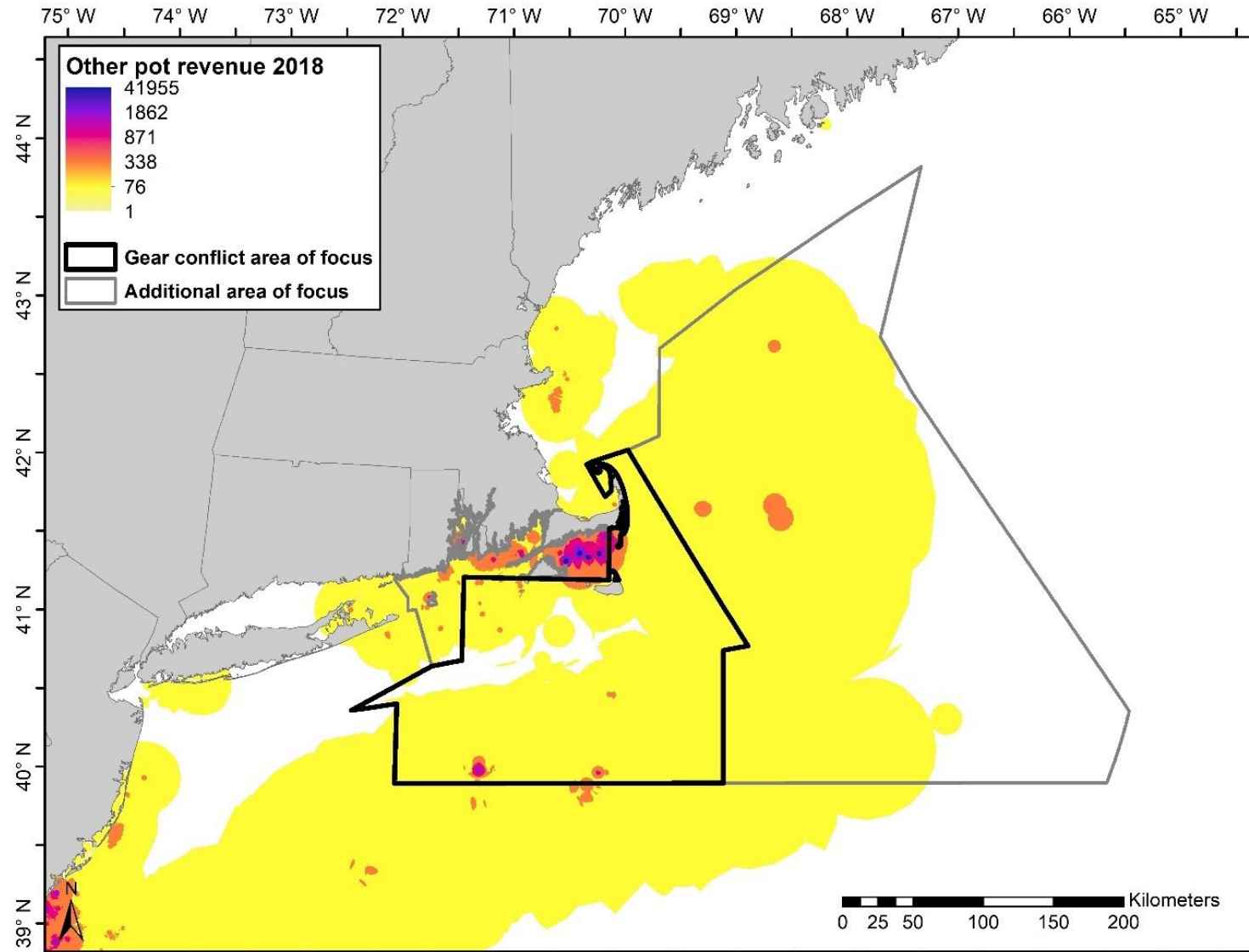


Figure B – 2. Other pot revenue in 2018.

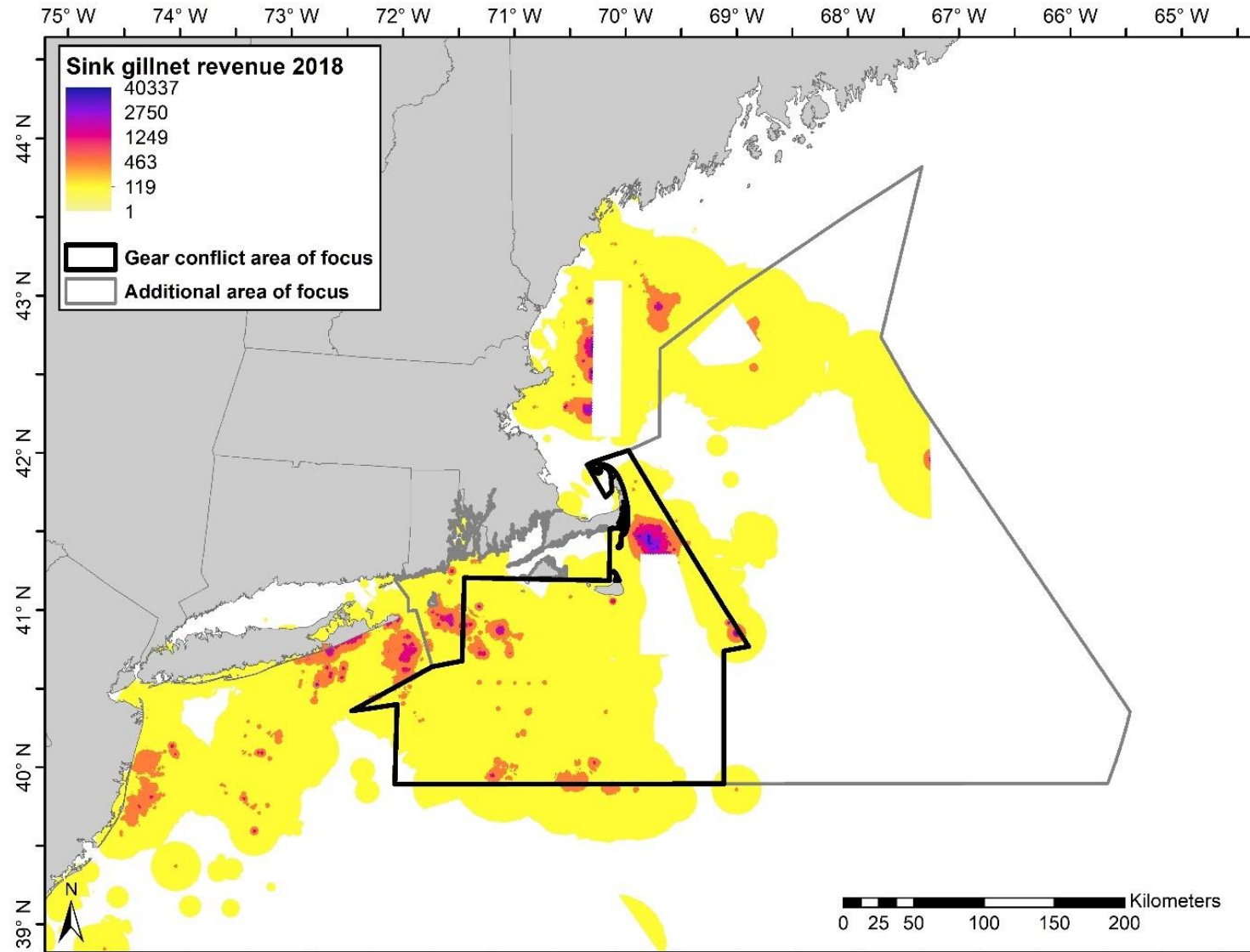


Figure B – 3. Sink gillnet revenue in 2018.

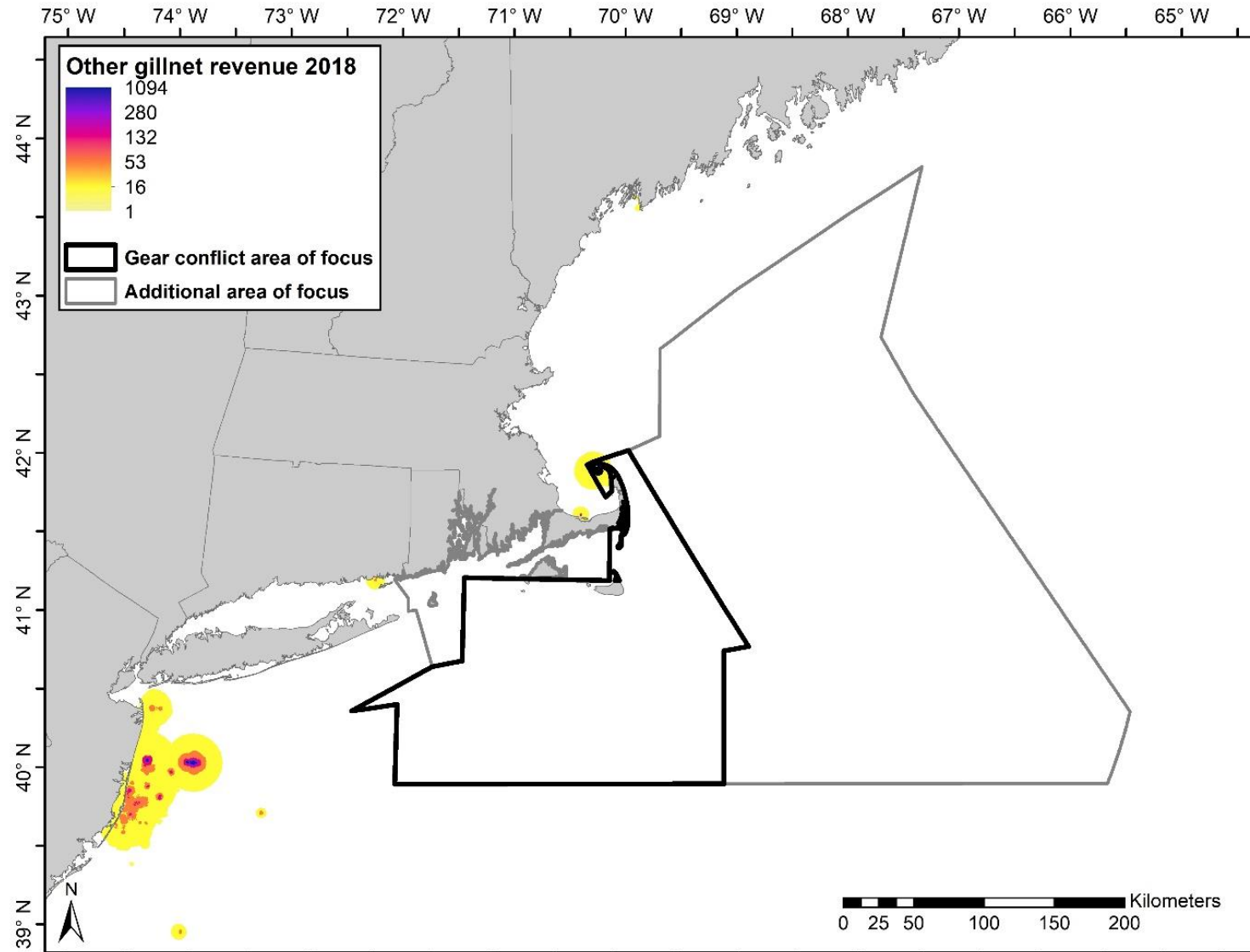


Figure B – 4. Other gillnet revenue in 2018.

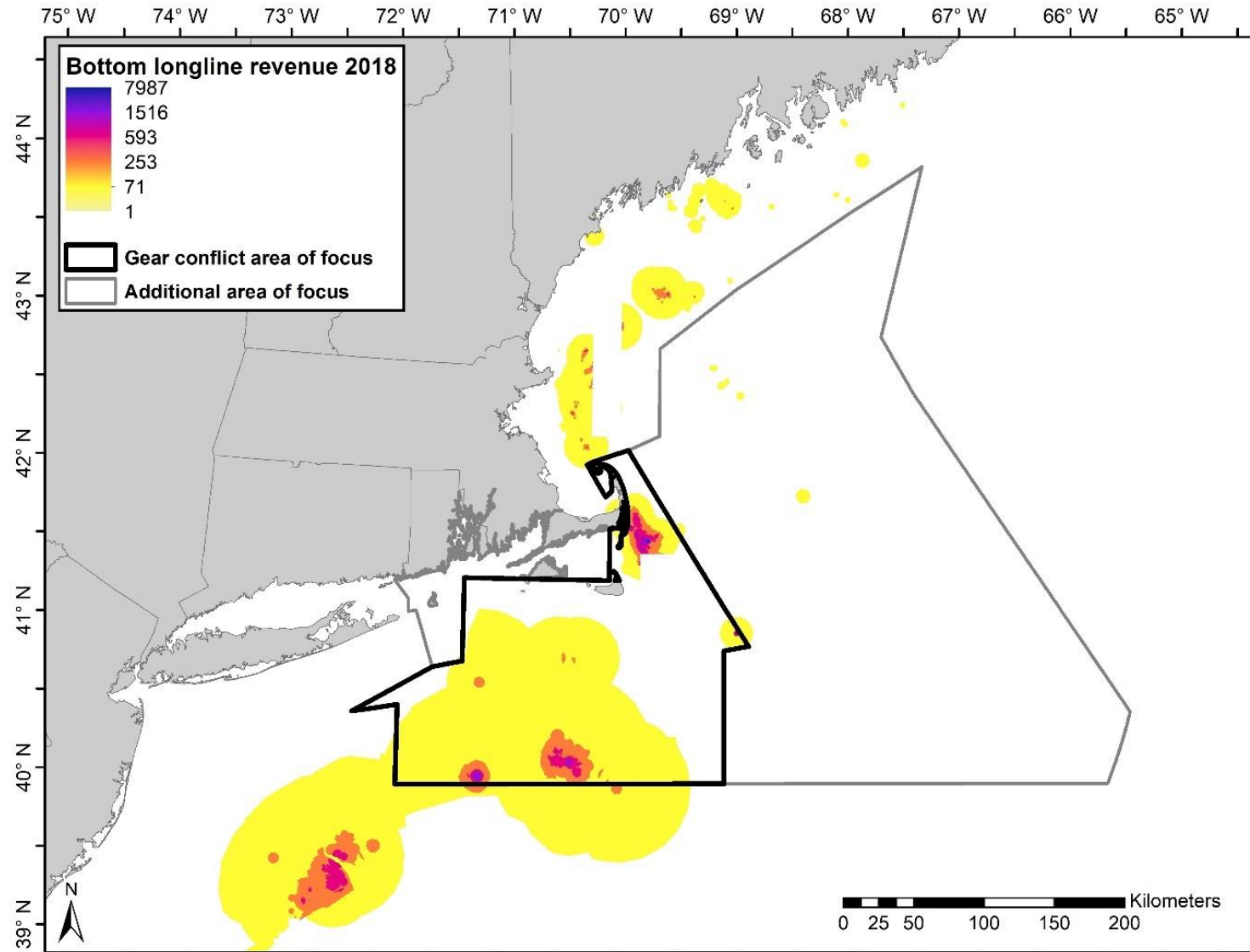


Figure B – 5. Bottom longline revenue in 2018.

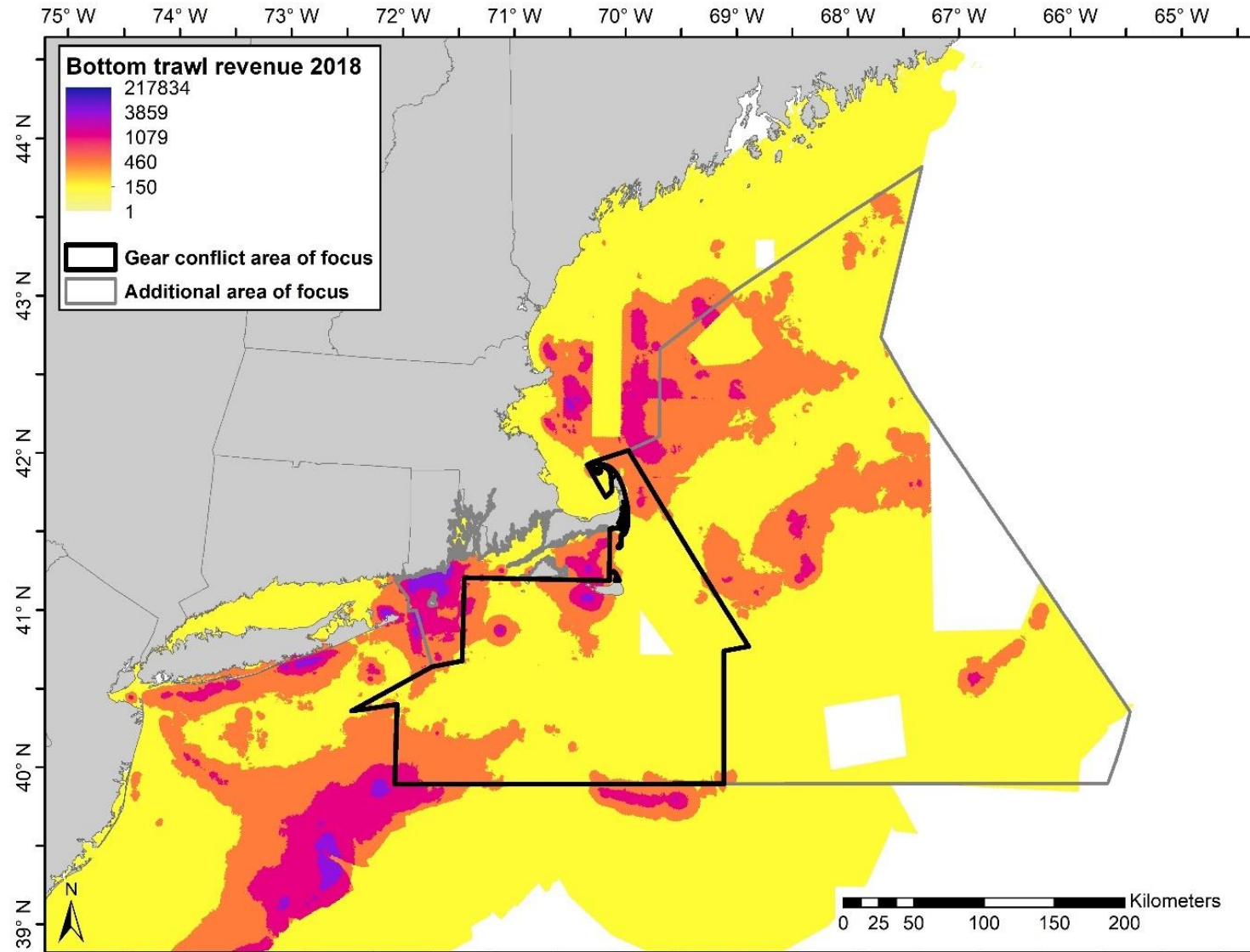


Figure B – 6. Bottom trawl revenue in 2018.

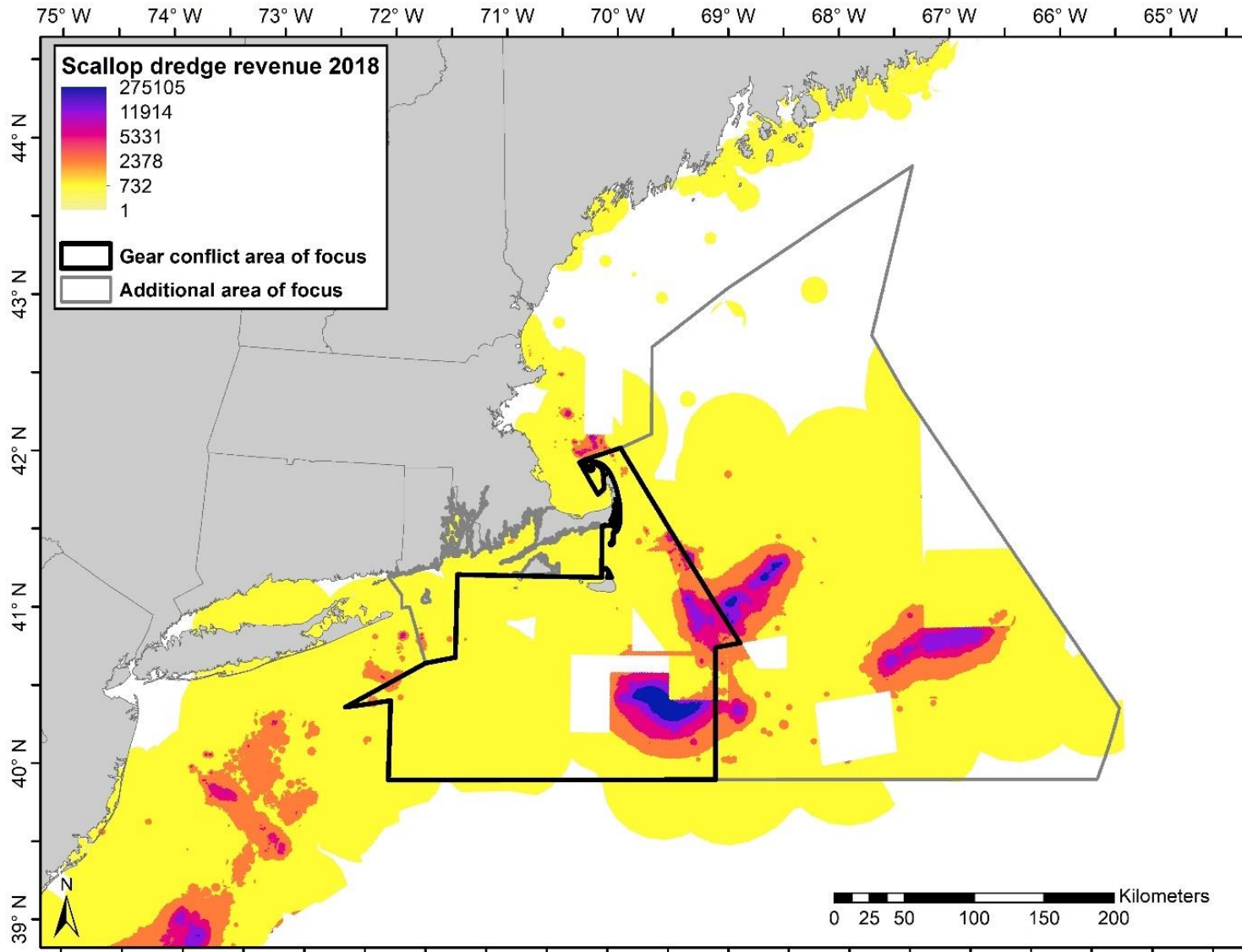


Figure B – 7. Scallop dredge revenue in 2018.

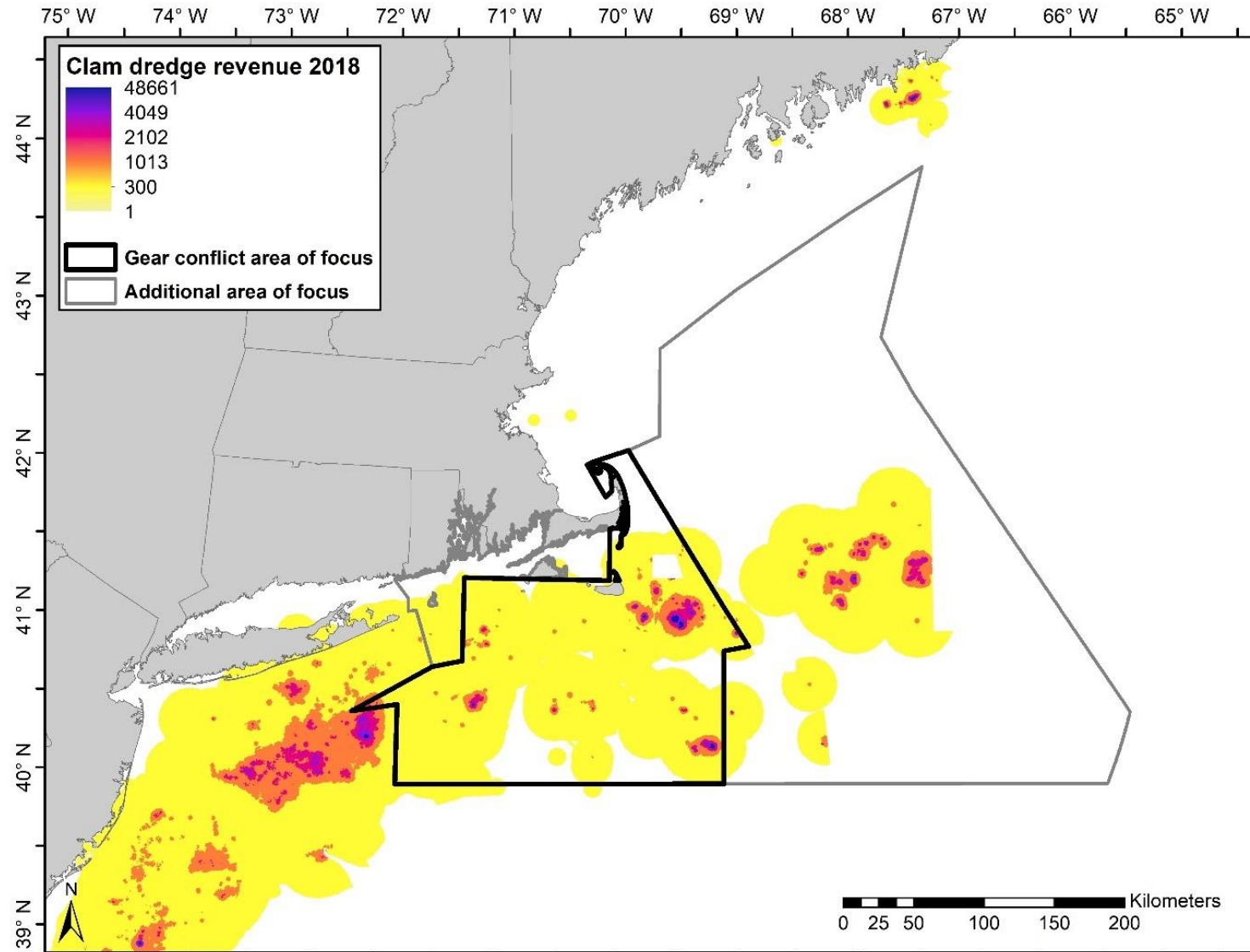


Figure B – 8. Clam dredge revenue in 2018.

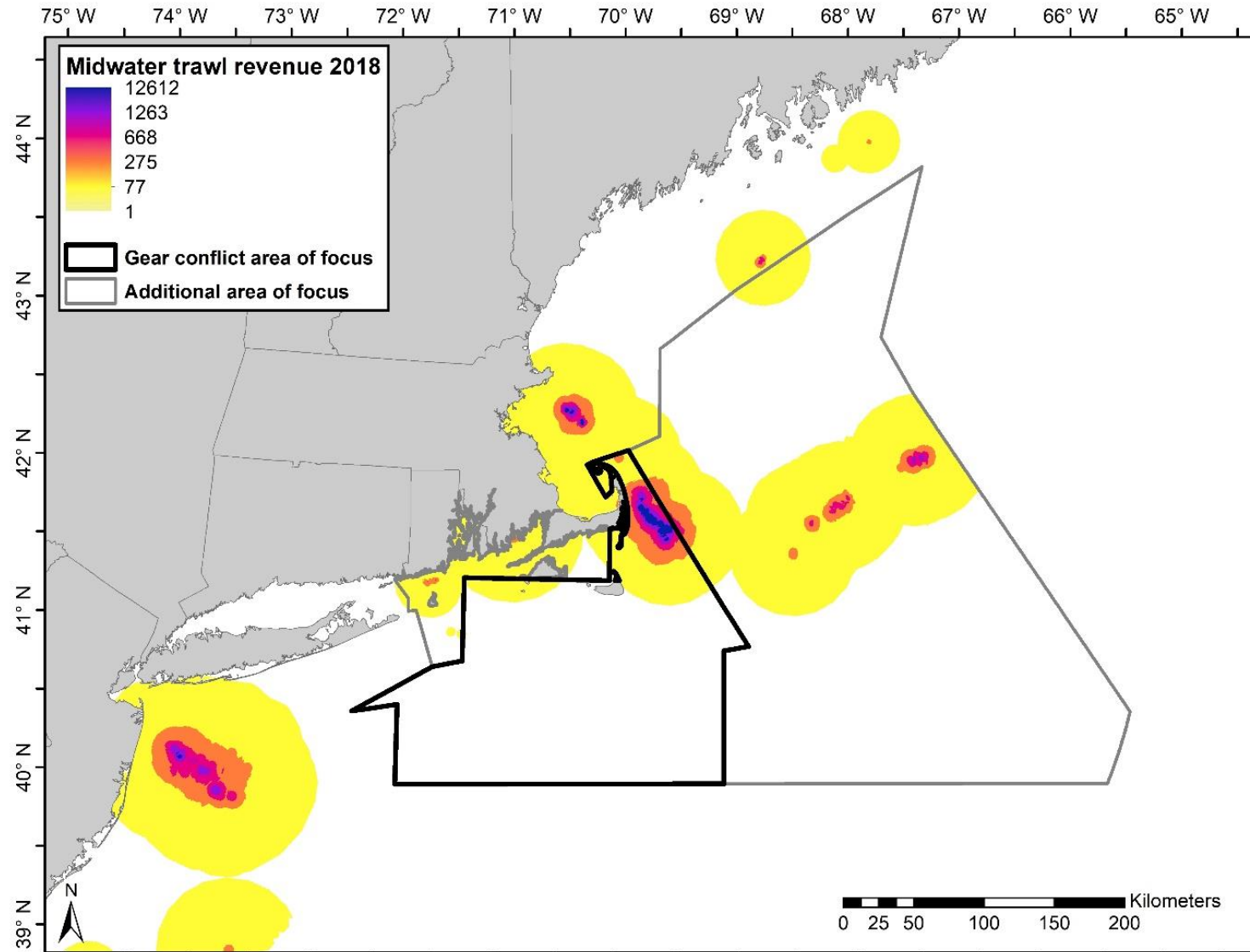


Figure B – 9. Midwater trawl revenue in 2018.

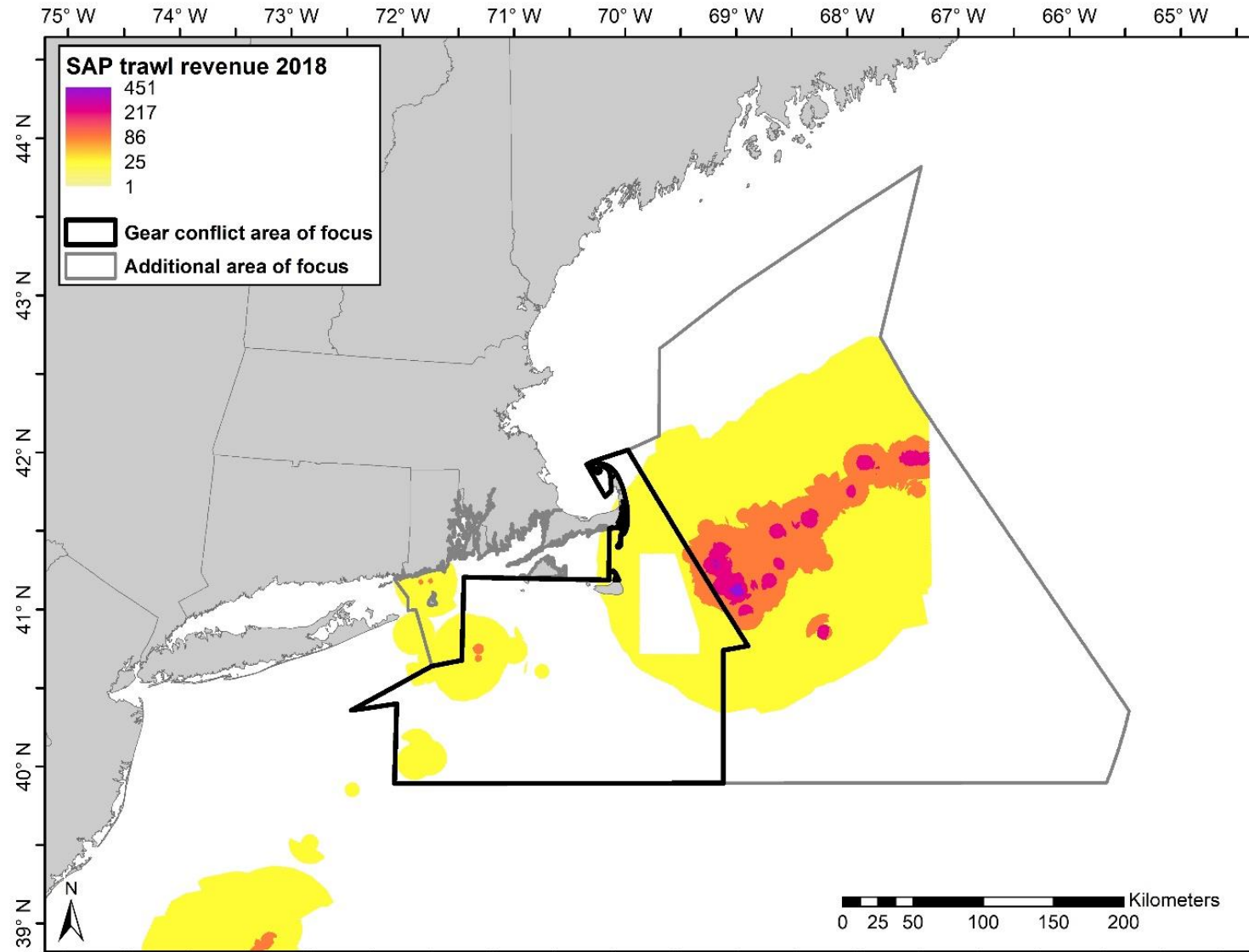


Figure B – 10. Special Access Program (SAP) trawl revenue in 2018.

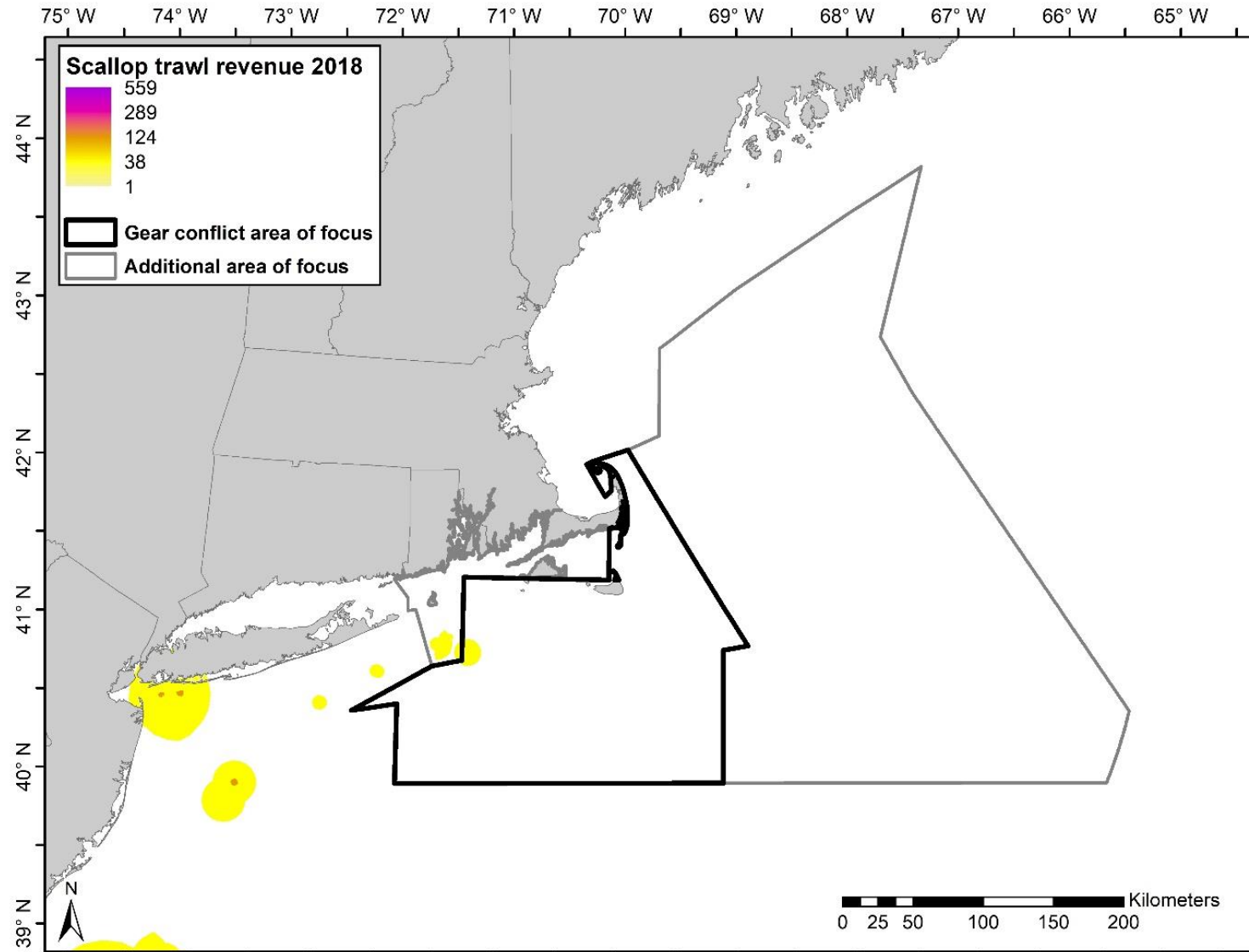


Figure B – 11. Scallop trawl revenue in 2018.

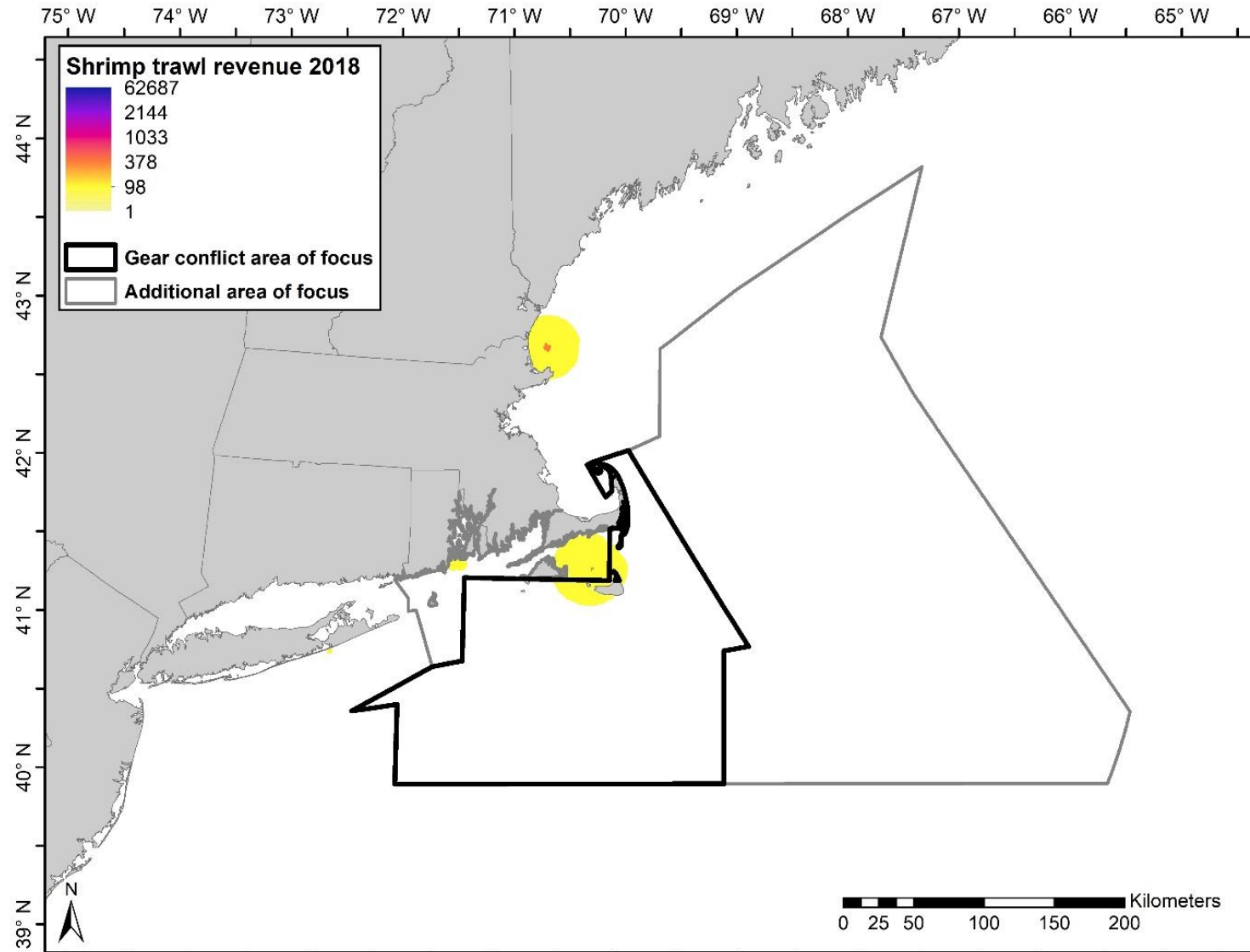


Figure B – 12. Shrimp trawl revenue in 2018.

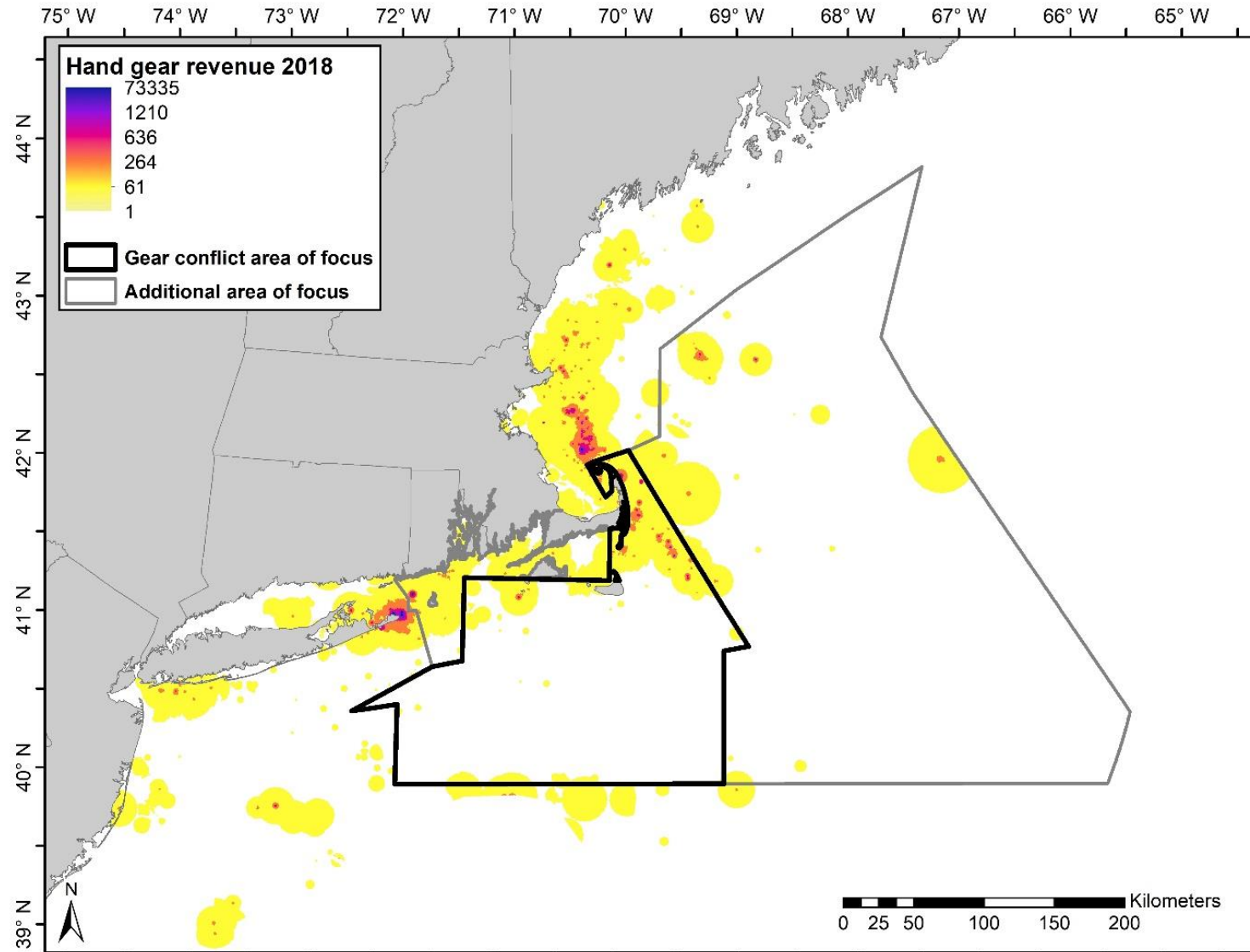


Figure B – 13. Hand gear revenue in 2018.

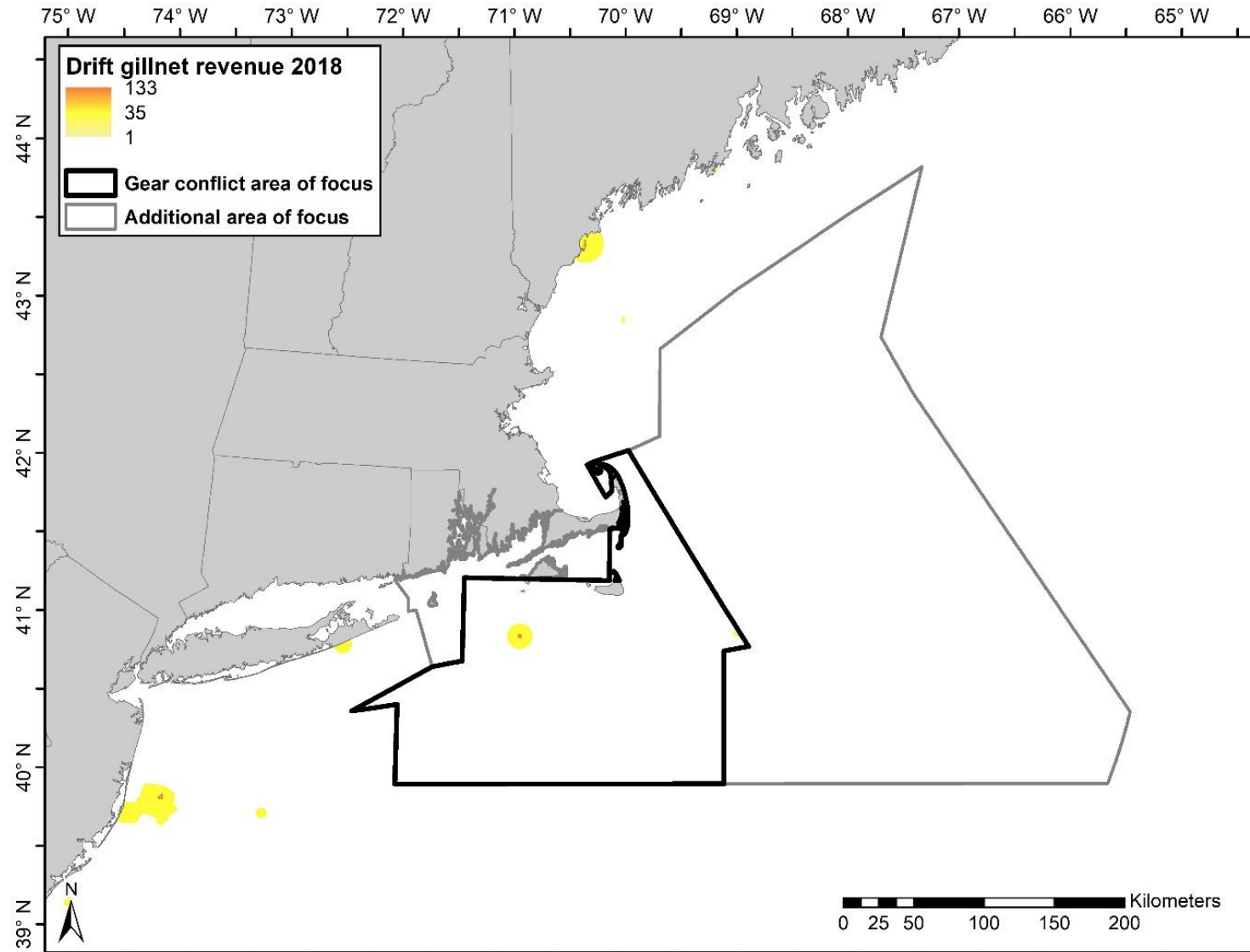


Figure B – 14. Drift gillnet revenue in 2018.

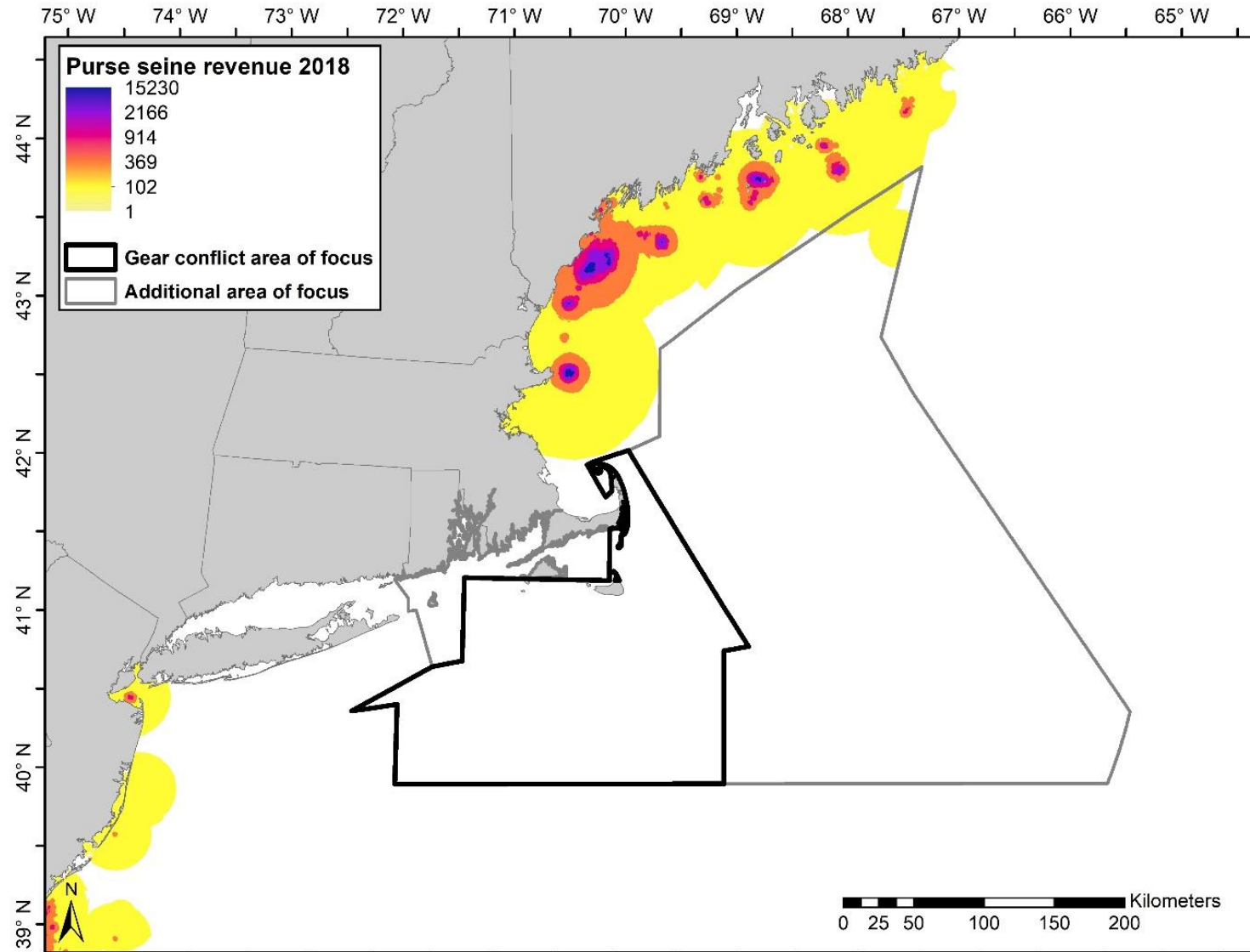


Figure B – 15. Purse seine revenue in 2018.

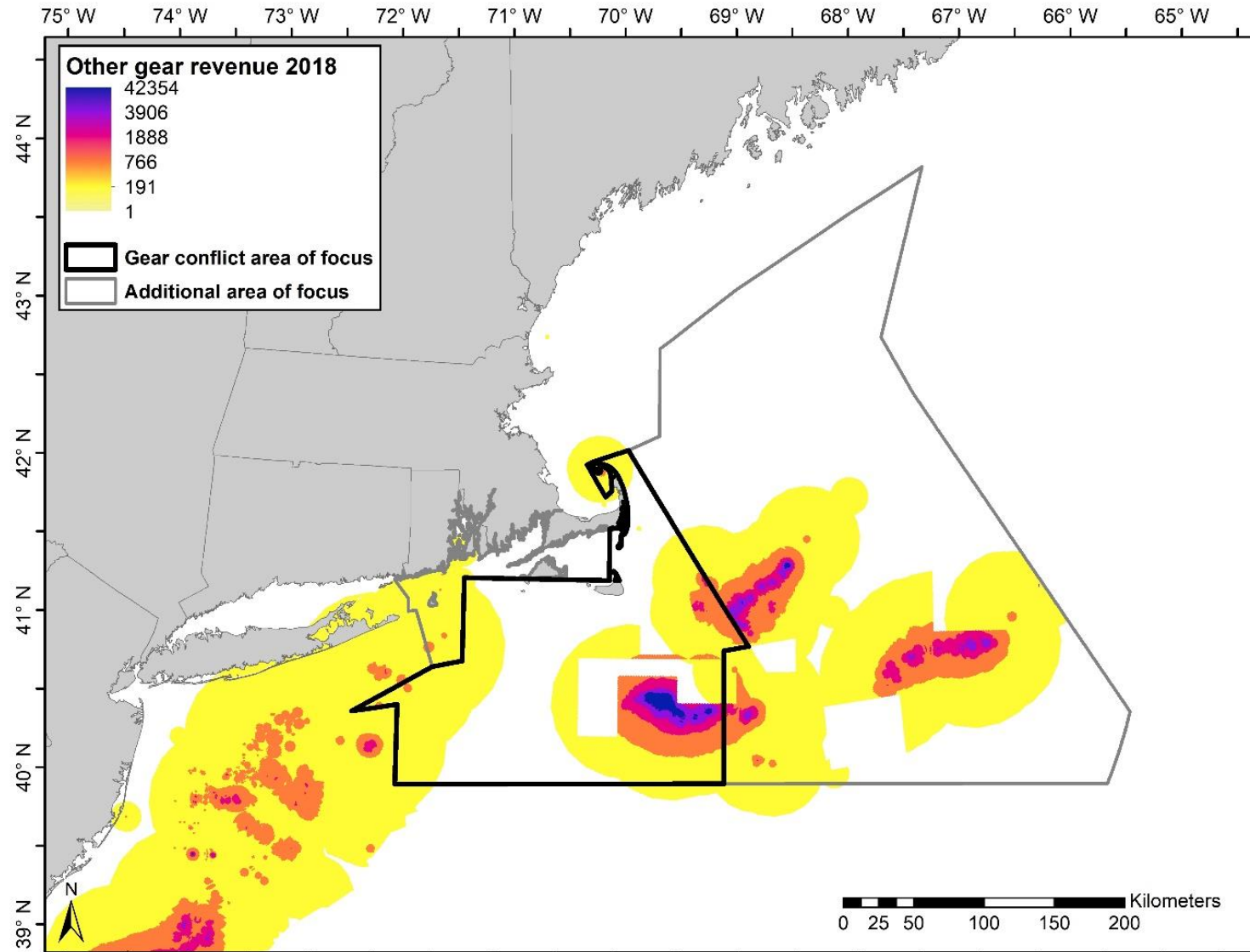


Figure B – 16. Other gear revenue in 2018.

Appendix C – Summary of Responses to Supplemental Questions

Fishermen were asked questions that were not directly related to issues surrounding gear conflict. Their responses are summarized below.

Concerns about on-demand gear beyond increased gear conflict

The most common concerns of fixed gear fishermen were related to cost (**Figure C – 1**). Most of these fishermen believed that the government would need to subsidize the adoption of on-demand fishing, and without subsidies, smaller vessels would go out of business if they were forced to purchase on-demand fishing systems.

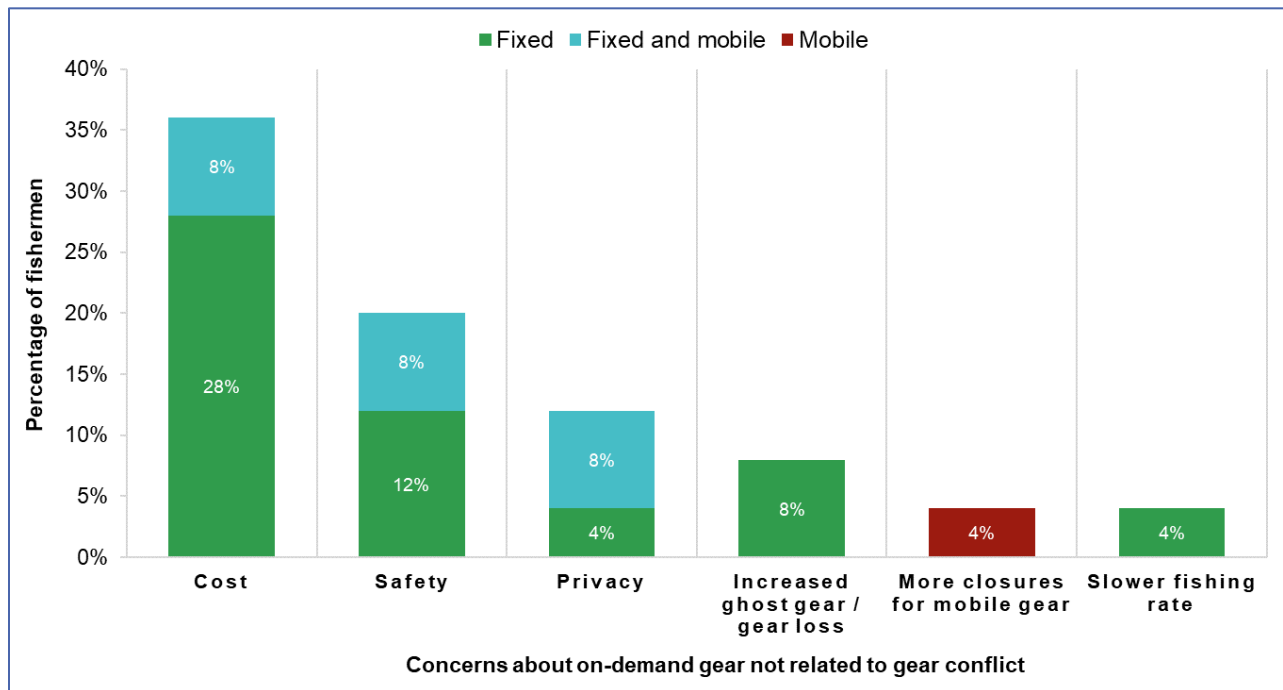


Figure C – 1. Concerns that fishermen had about on-demand fishing that are not related to gear conflict.

The second most common concern was related to safety, and some fishermen had serious concerns about the impacts of on-demand fishing on safety. There was concern that if a fisherman was dragged under by a trawl with on-demand gear, there would be no buoy or line to immediately grab and pull them to safety.

If someone gets whacked, or dragged under and the ropeless system takes five minutes to register and deploy the buoy, that's five minutes someone is under water. Or if this occurs on the buoy-less end without the ropeless system, then I'd have to steam to the other side and release the buoy – that adds more time to the person under the water.

Fixed-gear fisherman

Participants who fished with fixed gear were concerned about privacy. They believed that their fishing spots would be widely shared. Other fishermen understood that on-demand gear locations would be anonymous and only be visible when the gear was in close proximity to a vessel.

Been fishing for 28 years, [other fisherman] for 40 years, and all of a sudden I know where his grounds are and his hot spots – turns your stomach. Fishing spots should be kept private.

Fixed-gear fisherman

The app will allow other vessels to recognize that gear is in their path from 5 miles away. There's a misconception that other vessels will know exactly who's gear is in an area but that is false.

Fixed- and mobile-gear fisherman

Some fixed-gear fishermen believed that the presence of ghost gear would increase if on-demand fishing was adopted. Others had the opposite opinion and believed that gear loss would decrease with use of on-demand gear.

Other less common concerns were related to mobile fishing access and fishing rates. Mobile-gear fishermen were concerned that they would lose access to fishing areas if on-demand gear was adopted because fixed gear could be set in new areas. Some fixed-gear fishermen believed that fishing would be much slower with on-demand gear because setting and hauling trawls would take longer.

Fixed gears are protected by the Coast Guard, they are not regulated very hard, and they are not expected to have AIS. My grounds are diminishing. I already mark where I am at all times. How much more do I have to bend?

Mobile-gear fisherman

It was clear during the interviews that outreach to and education of regional fishermen is still needed. There was continuing confusion about the available technologies and the current state of research and development efforts. Even the use of the term on-demand fishing causes confusion, with fishermen differentiating on-demand and ropeless fishing by stating that on-demand fishing is the use of timed releases.

On-demand gear is different from ropeless gear - on-demand uses a time release mechanism that can be set ahead of time, and when that goes off, there's a buoy line in the water.

Fixed- and mobile-gear fisherman

Loss of fixed gear

The estimates given by fishermen for their rates of fixed-gear loss varied widely, ranging from 2 to 425 traps per year. Mobile-gear fishermen stated that they pulled up 3 to 20 traps per year, and most of this gear was ghost gear. Note that these numbers are not corrected for fishing effort.

None of the interviewed fixed-gear fishermen believe that storms were major contributors to their gear loss. They universally believed that their gear loss was primarily due to interactions with mobile gear. However, others acknowledged that New England beaches can be covered with traps after storms. All fishermen who have used on-demand gear believed that gear loss due to storms would decrease with on-demand gear relative to traditional gear because the drag caused by the buoys and vertical lines would no longer be an issue.

Impacts of wind farms

Fourteen of the interviewed fishermen currently fish in wind lease areas.

More than half of those who fish with fixed gear or with fixed and mobile gear hope to keep fishing in these areas after the wind farms are built (**Figure C – 2**). Others from these two groups did not offer an answer to the question.

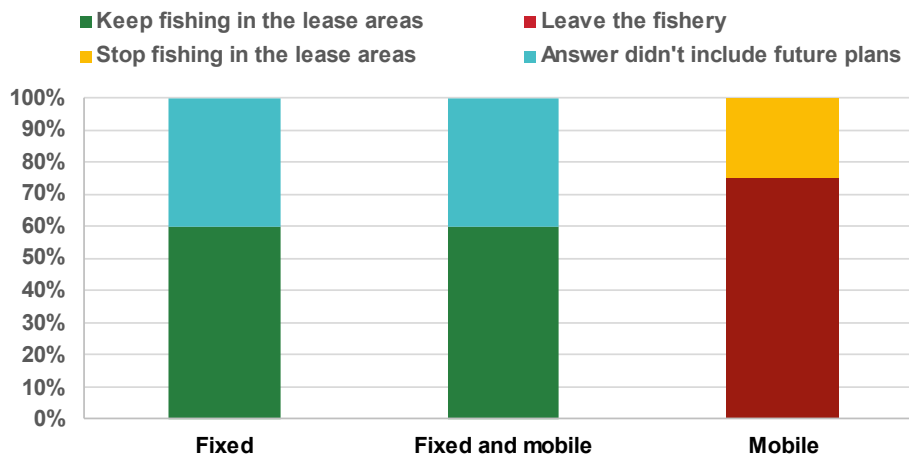


Figure C – 2. Future plans reported by fishermen who currently fish in wind lease areas.

The fishermen who fish exclusively with mobile gear were less hopeful about their future fishing livelihoods. Three-quarters of these fishermen plan to leave the fishery (**Figure C – 2**). The rest plan to try to keep fishing, but they will avoid the wind farms after they are built.

Fishermen who do not currently fish in the wind lease areas were concerned about longer transits while traveling to their fishing grounds, leading to increased fuel costs and longer trips. More than one participant was still hoping for transit lanes to be incorporated into the individual lease areas.