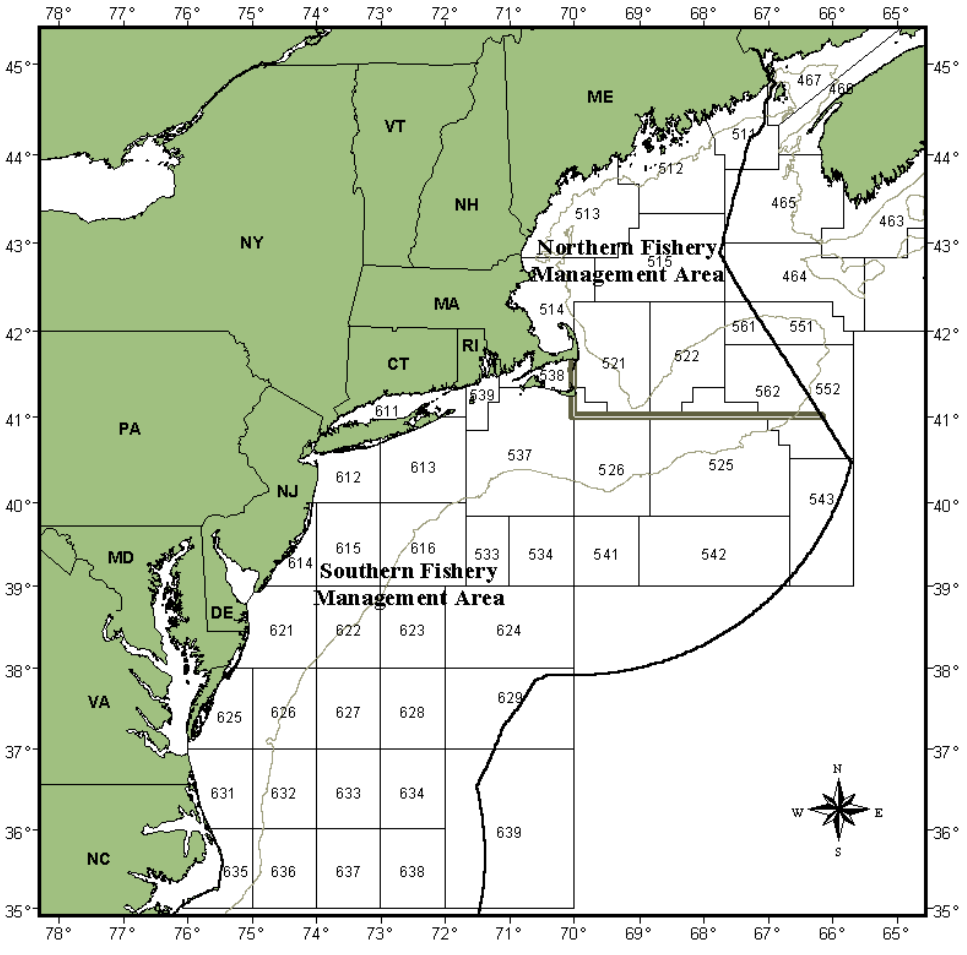
Two-Area Monkfish Management White Paper

Monkfish Plan Development Team

May, 2011



Executive Summary

This paper outlines issues and considerations of possibly having (a) separate and different fishing rules in the two management areas for monkfish, or (b) two separate and independent Monkfish FMPs with different lead Councils for each area. The Monkfish Committee tasked the Monkfish PDT to prepare this paper because of geographically divergent views on the suitability of catch shares management expressed during scoping on Amendment 6. The following conclusions and the more detailed discussion in the body of the paper are intended to help guide the decision process.

- The weight of current scientific evidence suggests a single stock in U.S. waters, or, if more than one stock, mixing is likely extensive
- There are no legal impediments to managing a single stock as two separate units, either with different rules within one FMP or as two FMPs, but the Councils would need to coordinate management between the two areas, and also provide sufficient justification to NMFS that the separation is consistent with MSA National Standards.
- A substantial number of vessels currently catch monkfish in both areas, either as a directed fishery or incidentally in the same year. The Councils will need to consider how to address the operational aspects of vessels that rely on access to both areas.
- Massachusetts' coastline borders both areas which presents unique operational and administrative considerations.
- Groundfish Sector vessels with ACE for groundfish stocks whose stock areas fall on both sides of the monkfish boundary will need consideration to allow, minimally, for incidental monkfish catch in both areas.
- Permit qualification based on history in an area raises considerations with regard to the history of fishing in both areas by a substantial number of vessels, within each year or year-to-year. An unknown number of vessels have historically fished in both areas in different years, making them potentially advantaged or disadvantaged in any history-based permit qualification or allocation. Without a careful evaluation, it is not yet clear how complete catch/landings data are for determining possible allocations by area. If the FMP is split into two, with separate area-based permits, the Council will need to accommodate future vessel sales and permit transfers between areas, including, the disposition of other permits associated with a transferred permit.
- From a socio-economic perspective, the two approaches under consideration will both require vessels to change their fishing and business strategies, especially those vessels that fish in both areas during the year, which will potentially impact income and relationships with dealers and processors. If the FMP is split into two, and a vessel qualifies for permits in both areas, there will be additional time, paperwork and administrative burden on vessel owners to comply with two sets of rules and participate in two plan development processes.
- Both approaches under consideration will likely increase the complexity of the FMP(s), add to the administrative burden on and workloads of NMFS, the Councils, and the states, especially Massachusetts which borders both areas. While having two sets of rules will add to the enforcement burden, that impact could be mitigated if the new rules are more enforceable than the current ones. Catch monitoring will need to be enhanced as a consequence of area specific ACLs and associated AMs.
- Under a single biological stock, sub-ACLs will need to be negotiated between the two areas, and area-specific accountability measures will need to be established so one area is not accountable for overages in the other area.

Purpose of this Paper

On March 29th, 2011, the Monkfish Oversight Committee, after its review of Amendment 6 scoping comments and on the recommendation of the Monkfish Advisory Panel, agreed by consensus to the following directive to the Plan Development Team (PDT):

> *Prepare a white paper outlining the issues and considerations in (a) having separate and different fishing rules in the two management areas, and (b) having two separate and independent FMP's with the NEFMC having the sole authority over the northern area and the MAFMC having sole authority over the southern area.*

This initiative is the result of geographically divergent views on the need for and suitability of catch shares management expressed during scoping on Amendment 6. Most of the supporting comments came from industry in the Northern Management Area (NMA), while most of the opposing views were expressed in the Southern Management Area (SMA). Most of the fishing vessels in the NMA are enrolled in groundfish sectors, and their monkfish fishing activity is closely integrated with their groundfish fishing. In contrast, most of the vessels in the SMA are not in sectors and engage in monkfish-specific directed fishing. Thus, the needs of the industry in the two areas are different, and the problems and issues each is facing potentially call for different solutions.

This paper will examine all aspects of the concepts described in the directive: biological, legal, operational, socio-economic, allocation and administrative/enforcement. The paper will describe issues and questions to be considered by policy makers and advisors if, and as, they develop these ideas into a management approach. Where possible, the paper will also suggest possible solutions, although, those suggestions are only a starting point for policy makers' discussions, and not proposed alternatives.

Biological Considerations

Evidence for Stock Structure in Monkfish

When the Monkfish FMP was implemented (1999), little direct information existed on stock structure of monkfish. The 23rd SAW (NEFSC 1997) reviewed indirect evidence from recruitment patterns, growth and maturation rates and concluded that there could be no definitive resolution of the question with the existing data. However, primarily because of differing recruitment patterns in the regions north and south of Georges Bank, the assessment was conducted as if there were two separate units. This practice has continued to the present, although SAW 50 (NEFSC 2010) presented a combined-area assessment in addition to the two separate assessments. The combined assessment was not reviewed because it was not on the SAW 50 Terms of Reference, and time for the SARC review was very limited.

Despite having a feeding strategy and morphology that might suggest a sedentary life style (contrasted with e.g. bluefish), monkfish are now understood to be capable of

extensive movement. Conventional tagging studies have recaptured European monkfish *Lophius piscatorius* up to 876 km (544 miles) from their release location (Laurenson et al. 2005). Several investigators have suggested that monkfish may ride currents to move long distances (Hislop et al. 2000, Laurenson et al. 2005) and returns from data storage tags reveal off-bottom movements that are consistent with this interpretation (Rountree et al. 2008; GMRI and NOAA, unpublished data). Monthly distribution plots from survey data show seasonal shifts, particularly in the southern mid-Atlantic Bight (e.g. February vs. April, Figure 1). A further mechanism for dispersal may be monkfish egg veils. Females spawn buoyant scarf-like egg cases that can reach 1.5 m across and 12 m long with a thickness of only a few mm (Martin and Drewry 1978); these physical characteristics suggest an evolutionary strategy for dispersal of progeny on currents.

In recent years, further indirect and direct evidence on stock structure has begun to accumulate. Improved sampling through industry-based cooperative surveys (Richards et al. 2008) has shown that growth rates do not differ between regions (Figure 2). Maturation rates differed significantly but the differences in median length and age at 50% maturity were relatively small (Figure 3). Recruitment patterns continue to differ between management areas, with recruitment pulses in the north during the 1990s that were absent or less strong in the south (Figure 4). However, evidence from recruitment patterns is equivocal because early life survival may differ in different regions, producing different recruitment signals even if all else is equal.

Direct evidence comes from two genetics studies (one completed, one ongoing) and an ongoing tagging program. A genetics study completed in 2000 analyzed genomic DNA of fish collected at 8 sites from North Carolina to Maine (Chikarmane et al. 2000). This study found a high degree of genetic similarity among samples and could not distinguish samples from north or south of the management line or from shallow vs. deep water, and thus provided no support for the separate stocks hypothesis. The ongoing study is examining mitochondrial DNA of fish collected during the 2009 cooperative monkfish survey in the mid-Atlantic Bight and Gulf of Maine. Although familial groups have been identified using mtDNA, there was no geographical assortment of the groups (Figure 5, B. Ngluwe, Univ. MD, unpublished), indicating that genetic structure is not aligned with the management areas, and thus providing no support for the separate stocks hypothesis. In other words, it appears that related individuals can be distributed randomly between the northern and southern areas.

Conventional tagging studies have obtained recaptures of fish in the mid-Atlantic Bight that were released in the western Gulf of Maine, showing that monkfish are capable of migrating across the management boundary (Figure 6; Sherwood and Grabowski, GMRI, unpublished) and great distances (up to 503 km; Figure 7). The reverse (movement from south to north) was not seen; however, this set of tags was released only during autumn (2007). On the other hand, recaptures were recorded over a period of 21 months providing ample time for movement in both directions. Either adult monkfish don't move often from south to north or reporting rates were too low in the north to capture this movement (Sherwood and Grabowski, GMRI, unpublished). Continuing work includes tag releases in other seasons and locations (further south and further north/east),

increased outreach, as well as data storage tag releases, which may help elucidate the movement patterns of individual fish.

At this time, the weight of evidence supports a single-stock hypothesis, with the possibility of extensive movement between management areas. Unfortunately, how much exchange occurs and the pathways of migration are very poorly understood at present, making it difficult to judge the implications for management. A number of scenarios can be envisioned, depending on the timing and extent of movements with respect to fishing pressure. An example: if fish that settle to benthic existence in the Gulf of Maine do not migrate south, and only the southern fish migrate north to find cooler temperatures in the summer, the southern fish would be subjected to fishing pressure in both areas, diluting the fishing pressure on the northern fish during the summer, thus leading to a higher F in the south and lower in the north, which may or may not be evident from assessment modeling.

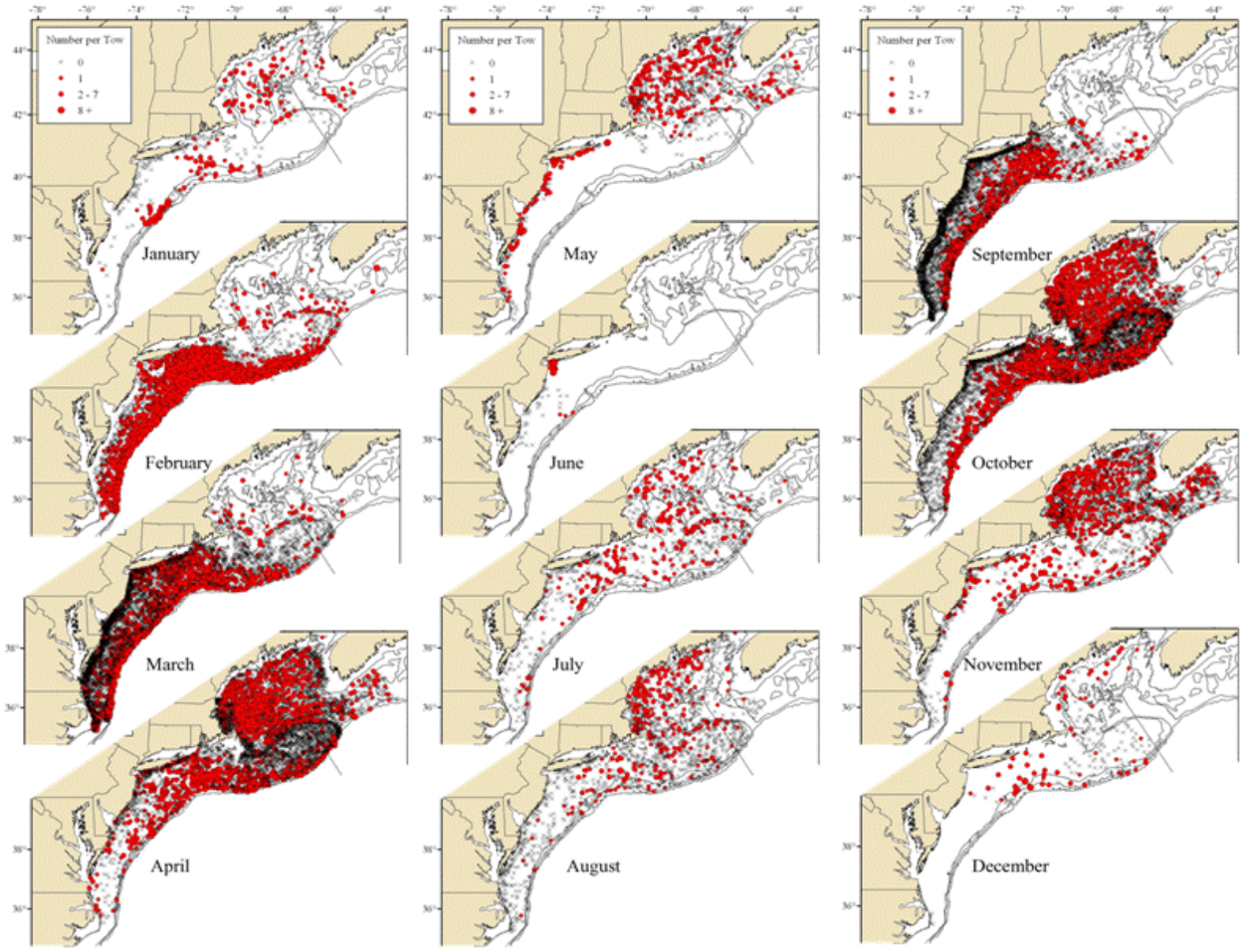


Figure 1 Monthly distribution of monkfish from fishery-independent trawl surveys, 1948-49 and 1963-2007 (from Richards et al., 2008). Gray x's denote stations where no monkfish were caught.

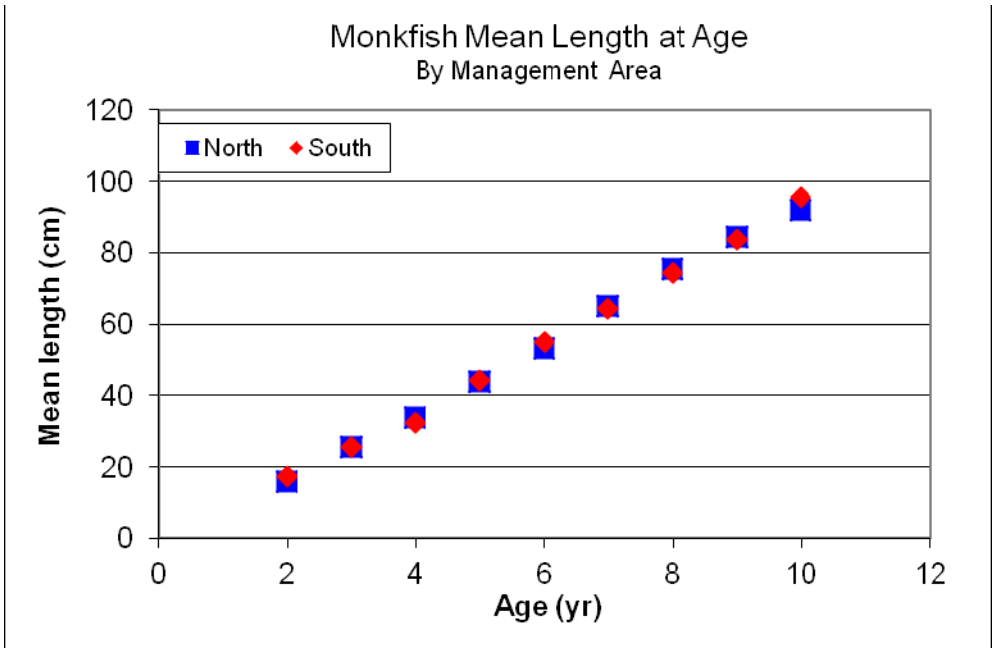


Figure 2 Mean length at age from vertebral aging of samples from 2004 cooperative monkfish survey, males and females combined because no growth differences were observed between sexes (NEFSC 2004).

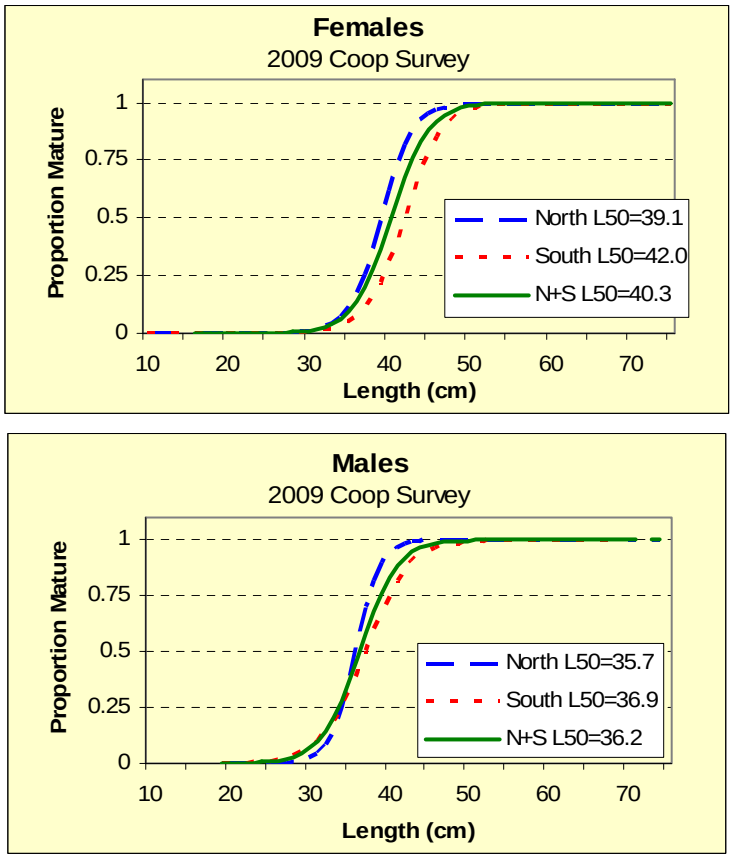
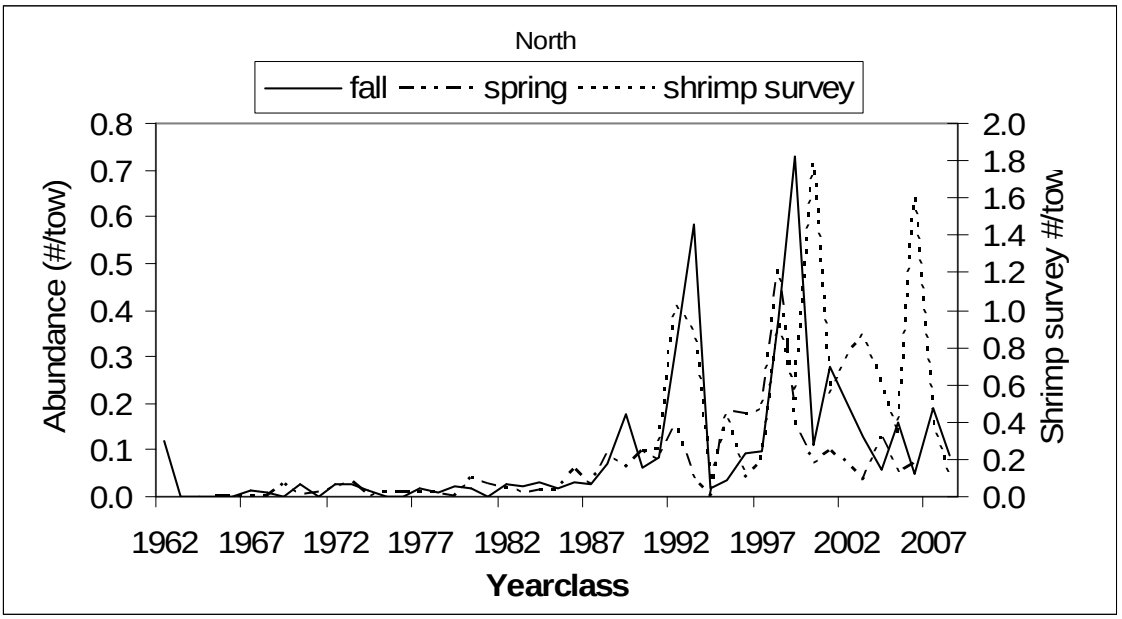


Figure 3 Maturity ogives for male and female monkfish from northern and southern management areas, 2009 cooperative survey data (NEFSC 2010).



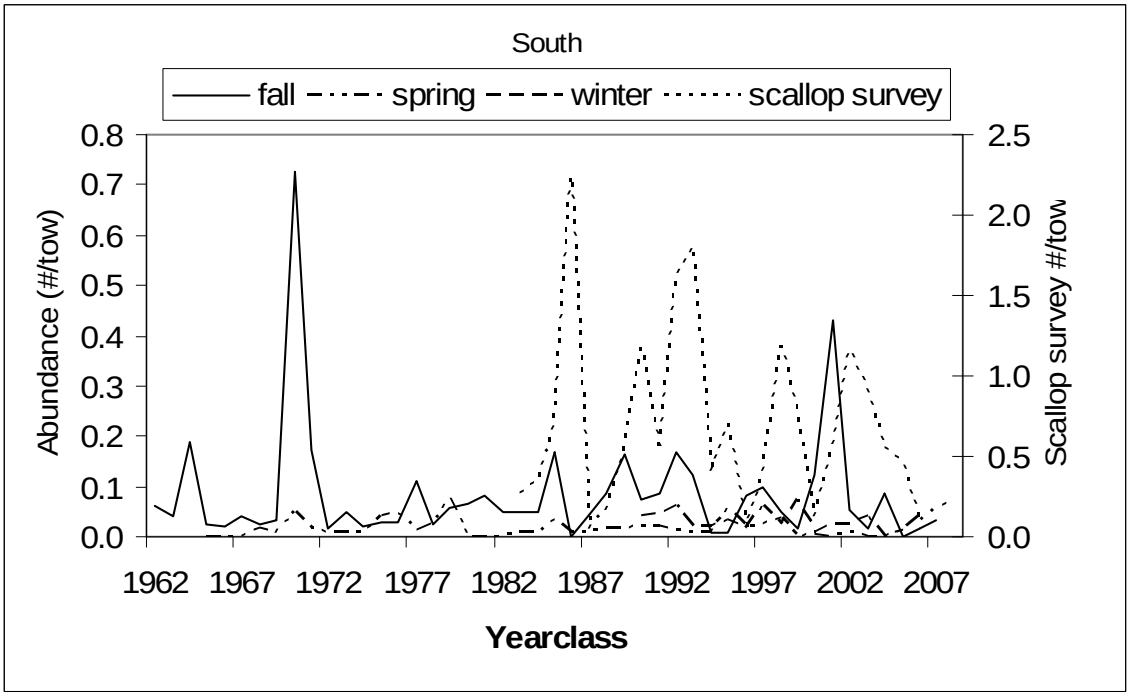


Figure 4 Abundance indices for approximate age 1 (shrimp, scallop and autumn surveys) and age 2 (winter and spring surveys) monkfish by yearclass. 2009 FSV Bigelow indices were corrected using calibration coefficient for numbers (NEFSC 2010).

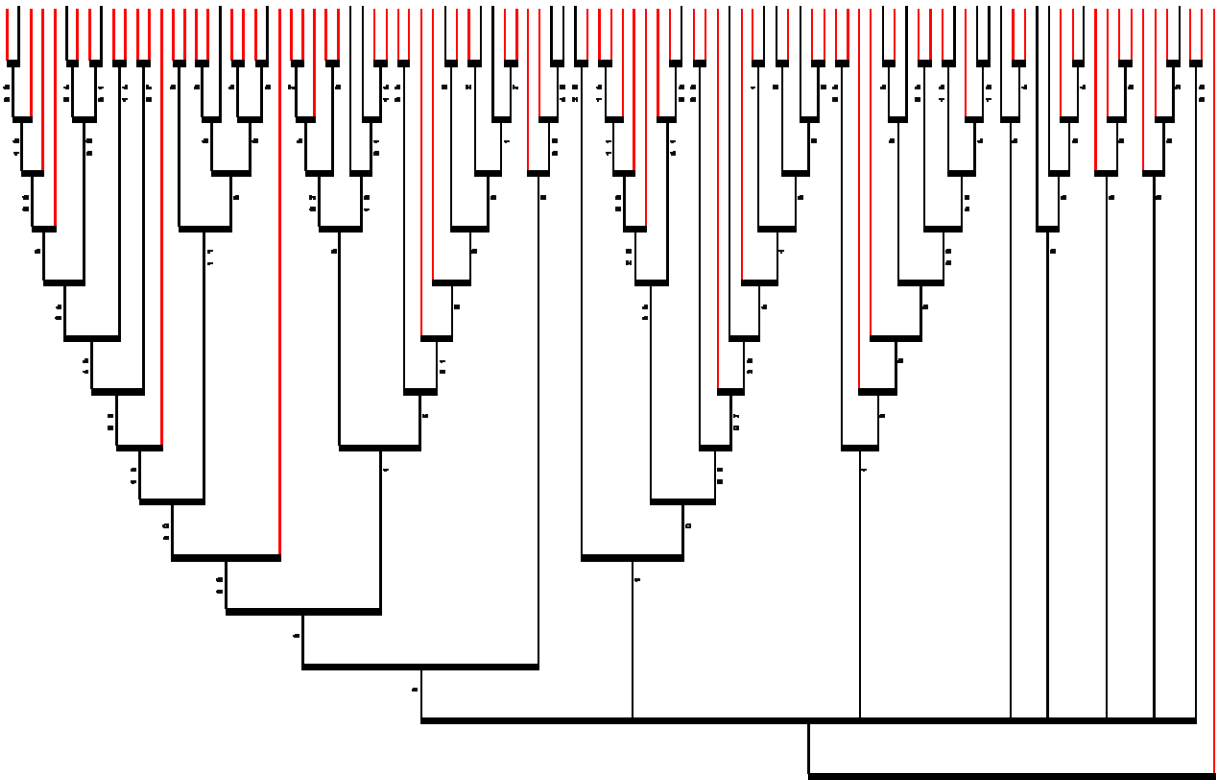


Figure 5 Graphical display of genetic clustering analysis using N-J Tree method with the sum of branch length = 0.17834515. The red branches are sequences from the southern management region and black are from the northern management region. Although familial groups could be identified, there was no geographical assortment of the groups. [Source: B. Nguluwe, unpublished, Masters thesis, in progress]

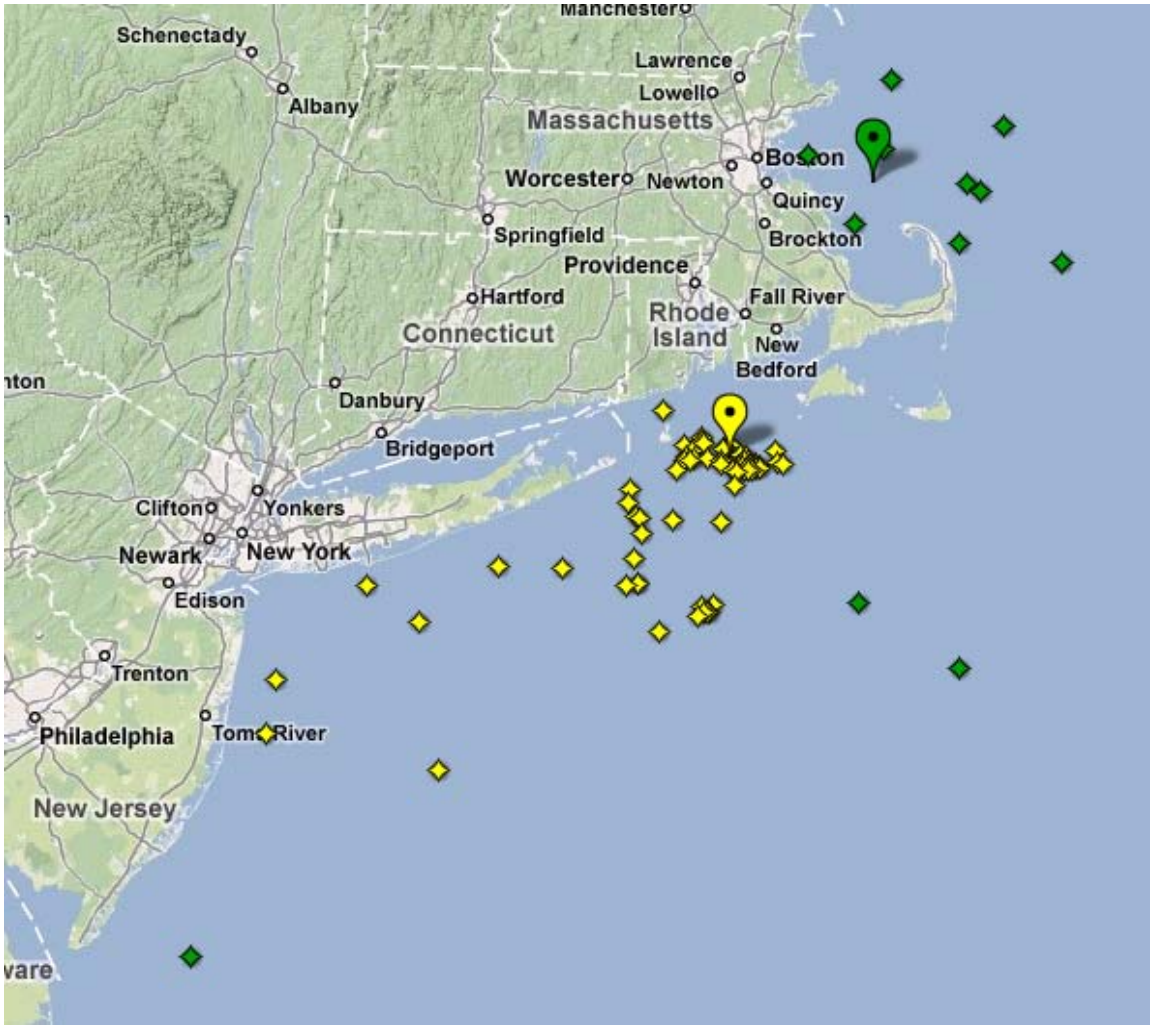


Figure 6 Map showing locations of release (balloons) and recapture (diamonds) of monkfish tagged with conventional tags during the fall of 2007 in the northern (green) and southern (yellow) management areas. [Source: Sherwood and Grabowski, GMRI, unpublished data, work in progress]

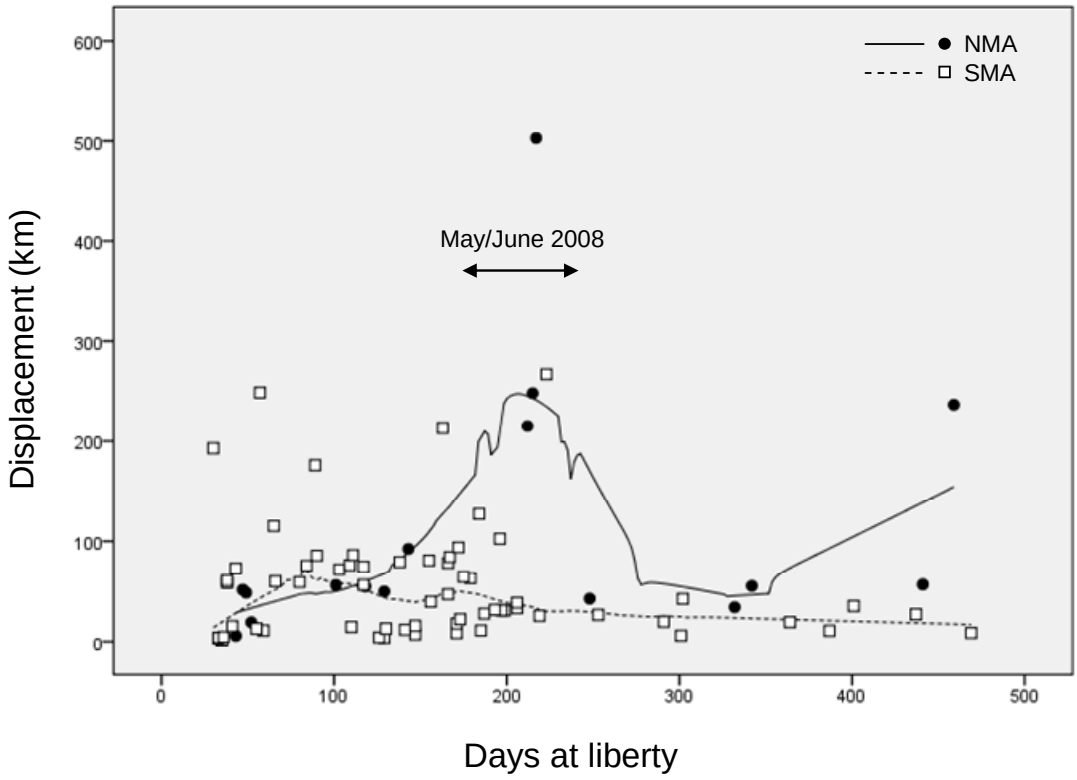


Figure 7 Total straight line displacement between release and recapture sites versus days at liberty by release area. Lines represent LOESS best fit. [Source: Sherwood and Grabowski, GMRI, unpublished data, work in progress]

Legal Considerations

National Standard 3 states:

> *To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.*

Since the inception of the FMP in 1999, the fishery has been assessed and managed as two distinct units, although the fundamental approach (DAS and trip limits) has been the same in both areas. In every management action document, the Councils include discussion of the action's compliance with the National Standards. The following is the discussion in Framework 7 under National Standard 3:

> *The FMP established a two-area management program for monkfish, covering the exploitable range of the species. SARC 34 discussed the basis for assessing goosefish as a single stock, versus two stocks, and concluded that information was insufficient to make a determination on a biological basis. The SARC noted that the choice of number of management units is independent of the number of assessment units, and that the use of two management units may be required because of the characteristically different fisheries that occur in the two areas, in terms of gear, catch composition, seasonality and other parameters. In Amendment 2, the Councils considered a single-stock approach, but rejected it for further analysis and consideration prior to the development of the DSEIS. SARC 50 did not change the findings of the previous assessment, and the Councils are not changing this two-area approach due to the equivocal scientific information.*

Thus, while current scientific information is not sufficiently conclusive to change the way monkfish is assessed, as noted in the previous section, the evidence is mounting that there is only one stock, and potentially substantial mixing between the two areas in various life stages. While the transition to a single stock presents some challenges with regard to management and allocation, it does not prevent the Councils from separating management under the terms of National Standard 3, provided the Councils can adequately justify that move.

National Standard 3 Guidelines state the following:

> 50 CFR 600.320 …
> *(b) <u>General</u>. The purpose of this standard is to induce a comprehensive approach to fishery management. The geographic scope of the fishery, for planning purposes, should cover the entire range of the stocks(s) of fish, and not be overly constrained by political boundaries. Wherever practicable, an FMP should seek to manage interrelated stocks of fish.*
> *(c) <u>Unity of management</u>. Cooperation and understanding among entities concerned with the fishery (e.g., Councils, states, Federal Government, international commissions, foreign nations) are vital to effective management.* ***Where management of a fishery involves multiple jurisdictions, coordination among the several entities***

should be sought in the development of an FMP. Where a range overlaps Council areas, one FMP to cover the entire range is preferred. *The Secretary designates which Council(s) will prepare the FMP, under section 304(f) of the Magnuson-Stevens Act.*
*(d) Management unit. **The term ``management unit'' means a fishery or that portion of a fishery identified in an FMP as relevant to the FMP's management objectives.***
*(1) Basis. **The choice of a management unit depends on the focus of the FMP's objectives, and may be organized around biological, geographic, economic, technical, social, or ecological perspectives.** For example:*
(i) Biological--could be based on a stock(s) throughout its range.
(ii) Geographic--could be an area.
(iii) Economic--could be based on a fishery supplying specific product forms.
(iv) Technical--could be based on a fishery utilizing a specific gear type or similar fishing practices.
(v) Social--could be based on fishermen as the unifying element, such as when the fishermen pursue different species in a regular pattern throughout the year.
(vi) Ecological--could be based on species that are associated in the ecosystem or are dependent on a particular habitat.
*(2) Conservation and management measures. FMPs should include conservation and management measures for that part of the management unit within U.S. waters, although the Secretary can ordinarily implement them only within the EEZ. **The measures need not be identical for each geographic area within the management unit, if the FMP justifies the differences.** A management unit may contain, in addition to regulated species, stocks of fish for which there is not enough information available to specify MSY and OY or to establish management measures, so that data on these species may be collected under the FMP.*
(e) Analysis. To document that an FMP is as comprehensive as practicable, it should include discussions of the following:
(1) The range and distribution of the stocks, as well as the patterns of fishing effort and harvest.
*(2) **Alternative management units and reasons for selecting a particular one. A less-than-comprehensive management unit may be justified if, for example, complementary management exists or is planned for a separate geographic area or for a distinct use of the stocks,** or if the unmanaged portion of the resource is immaterial to proper management.*
(3) Management activities and habitat programs of adjacent states and their effects on the FMP's objectives and management measures. Where state action is necessary to implement measures within state waters to achieve FMP objectives, the FMP should identify what state action is necessary, discuss the consequences of state inaction or contrary action, and make appropriate recommendations. The FMP should also discuss the impact that Federal regulations will have on state management activities.

Thus, both approaches considered in this paper, separate management programs in the two areas and two separate FMPs with different lead Councils, while not preferred under National Standard 3, are feasible, provided the FMP(s) justifies the approach and that the management of both areas (whether a joint FMP or two FMPs) is done in close coordination. The FMP(s) should include the appropriate mechanisms demonstrating that

cooperation, such as, participation in the management process by Council representatives of both areas, or the establishment of a joint committee to reach allocation decisions. One proposal that has already been made is for each Council to meet as a "committee of the whole Council" with representatives from the other region to consider management decisions. Subsequently, the committee-level decisions would be considered by the lead Council for formal approval.

With regard to biological reference points, National Standard 1 Guidelines, in the discussion of the relationship to other National Standards, states the following with regard to National Standard 3:

> 50 CFR 600.310 …
> *(l) (2) National Standard 3 (see Sec. 600.320). Reference points should generally be specified in terms of the level of stock aggregation for which the best scientific information is available (also see paragraph (e)(1)(iii) of this section). Also, scientific assessments must be based on the best information about the total range of the stock and potential biological structuring of the stock into biological sub-units, which may differ from the geographic units on which management is feasible.*

Under this guideline, if the best scientific information supports conclusively that monkfish is a single stock, it would have to be assessed at that level, unless there is some biological basis for subdividing the stock into sub-units. If, in fact, monkfish is assessed as a single stock, but managed as two stocks, a mechanism would have to be established to allocate a sub-ACL to each area, and independent accountability measures would have to be adopted so that one area is not accountable to the other in the event of an overage of an ACL.

In conclusion, there is a preference under National Standard 3 that a single stock be managed as a unit. However, the National Standard 3 guidelines clearly allow a unit stock to be managed differently by geographic area if the FMP justifies this and incorporates mechanisms to coordinate management between regions. Although National Standard 3 or its guidelines do not legally prohibit one stock being managed under different FMPs or Councils, NMFS would need justification to re-designate monkfish management between the two Councils, based on the impracticability of the stock being managed jointly.

Operational Considerations

This section focuses on issues and considerations that arise for vessels and vessel owners under the separated management regime. Based on information presented in previous SAFE Reports and FMP documents there are vessels that fish in both areas, on the same trip, on different trips in the same season, seasonally or in different years. In some cases, those vessels only target monkfish (use a DAS) in one area but have incidental monkfish catch in both areas when engaged in other directed fishing. Whether the fishery remains under one FMP with different rules for each area, or is split into two FMPs, the rules applicable to each area should continue to make provisions to allow retention of incidentally caught monkfish to minimize discards.

There are 758 limited access monkfish permit holders, and approximately 2,150 vessels holding an open access category E permit. Based on activity reports, 582 and 546 limited access permit holders landed at least one pound of monkfish in the fishing years 2008 and 2009, respectively. Of those, 141 and 171 vessels landed monkfish from both areas in 2008 and 2009, respectively, including landings on and not on a monkfish DAS (Figure 8).

Of the 546 limited access vessels that landed monkfish in 2009, 235 used at least one DAS, and about 55 of those landed monkfish from both areas (Table 1). Only about half of the limited access vessels that landed monkfish landed at least one pound of monkfish on a monkfish DAS in FY2009, while the rest only landed monkfish incidental to other fishing. Of those that landed monkfish on a DAS, about half landed monkfish on a DAS only from the SMA, while about one quarter landed from both areas, and one quarter only from the NMA (Table 1 and Figure 9).

On the vessels that only landed monkfish from the SMA while on a monkfish DAS, most (~85%) had monkfish landings on a DAS that exceeded monkfish incidental landings (not on a DAS). In contrast, almost all of the vessels that had monkfish landings on a DAS in the NMA, had incidental (not on a monkfish DAS) landings that exceeded their directed landings, which supports the idea that monkfish is a component of the catch while vessels are targeting groundfish. On vessels that had monkfish DAS landings from both areas, most of those landings were from the SMA, and landed while on a monkfish DAS (Figure 9).

If DAS usage is the indicator that a vessel is directing effort on monkfish, then these data confirm previous analyses that concluded that most of the directed effort occurs in the SMA, while most of the monkfish landed in the NMA is incidental to fishing for groundfish. Nonetheless, for the purpose of this paper, the fact that one quarter of the vessels that landed monkfish on a DAS did so from both areas, suggests that this is an important consideration when splitting the FMP into two, or when applying different regulations in the two areas.

	Number of vessels and source		
Monkfish landings in:	**FY2008 VTRs**	**FY2009 VTRs**	**FY2009 Monkfish DAS declarations**
SMA Only	323	260	120
Both	141	171	55
NMA Only	118	115	60
Total	582	546	235

Table 1 - Number of vessels that landed monkfish in FY 2008 and FY 2009 by area and permit category

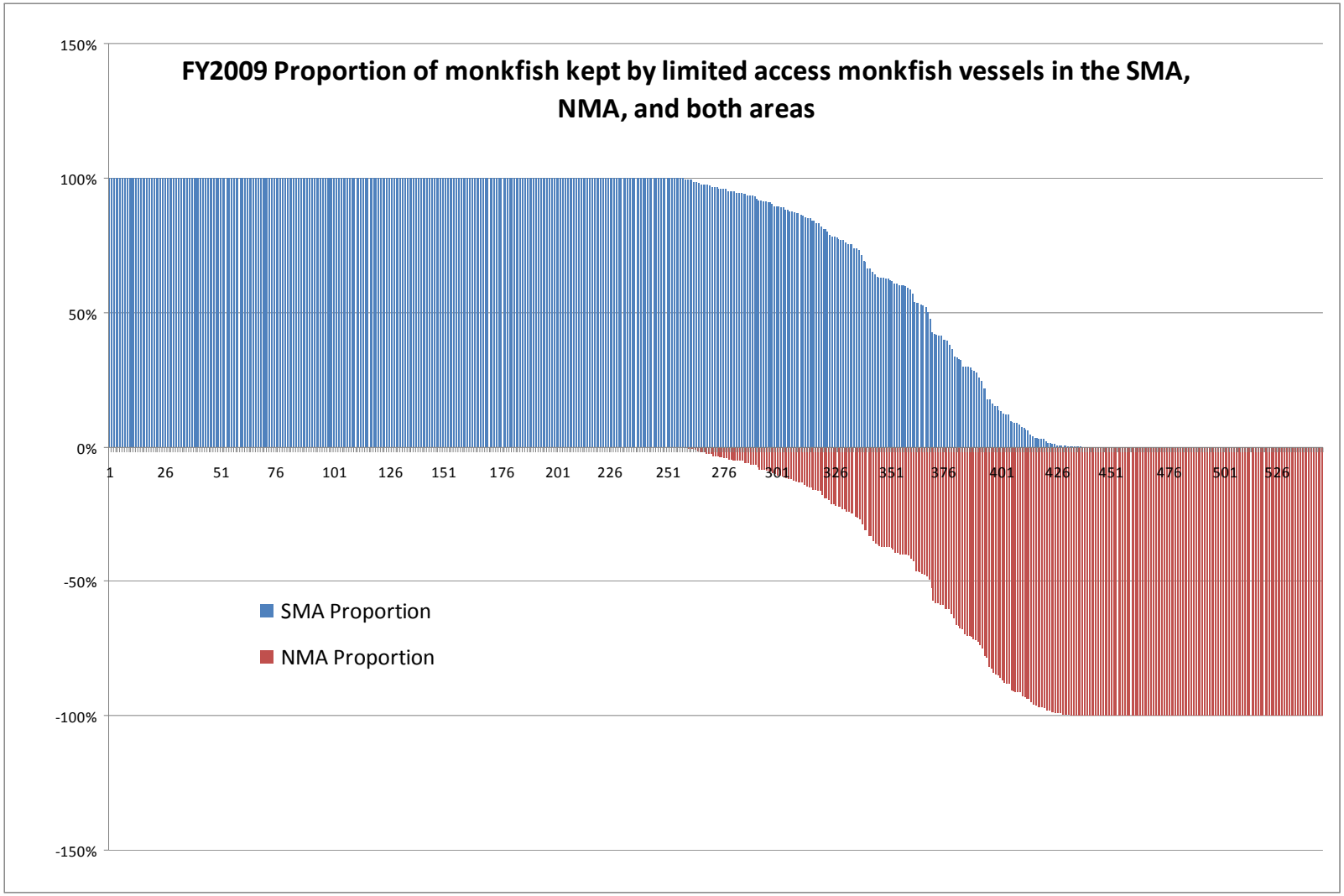


Figure 8. FY2009 proportion of total monkfish landed by limited access vessels by management area.

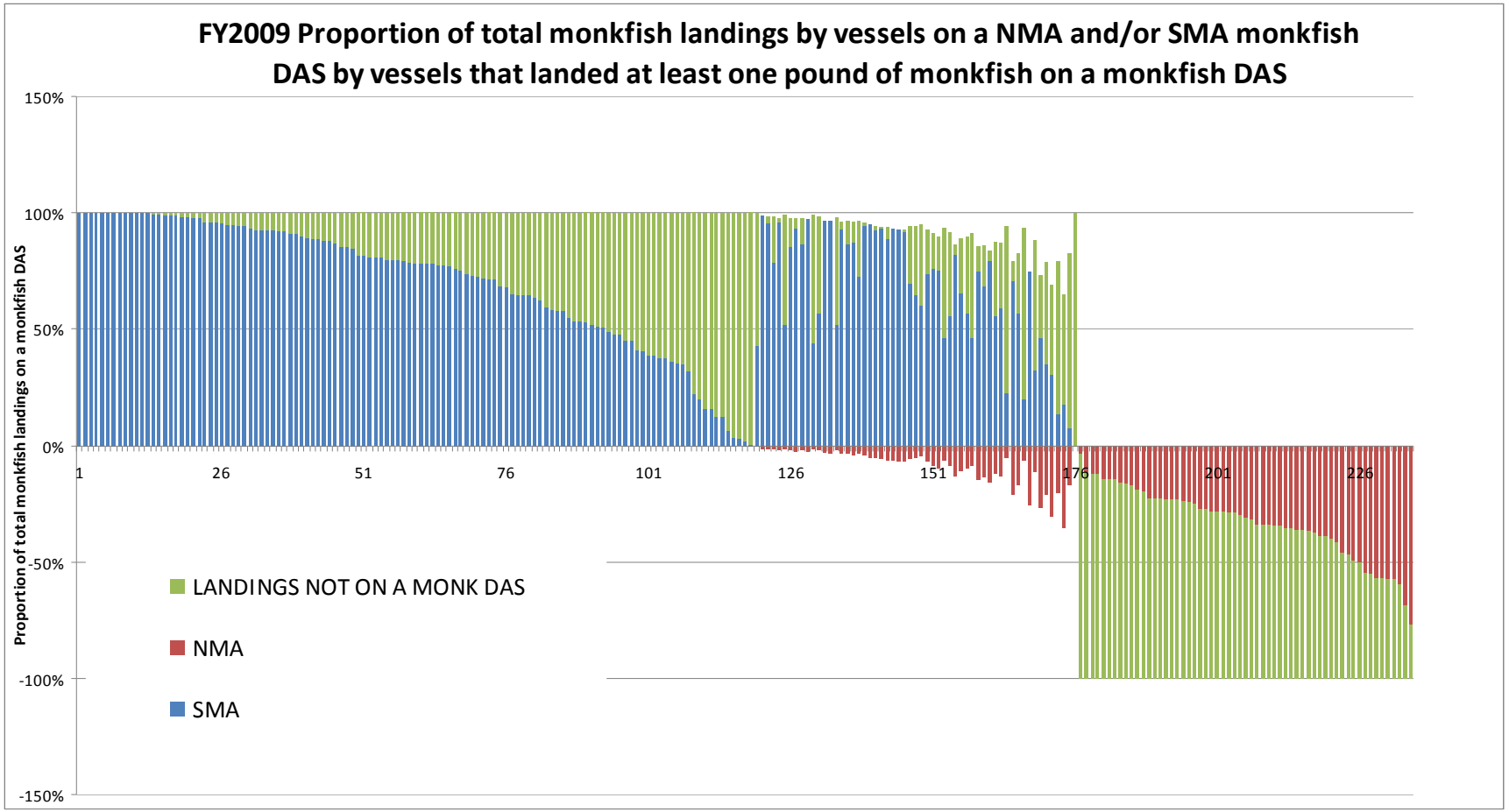


Figure 9 FY2009 proportion of total monkfish landings (incidental and directed) by vessels that landed at least one pound of monkfish on a monkfish DAS

For vessels that only fish in one area in a given year, whether there are different regulations in each area, or they are managed by different FMPs is not likely to have an immediate or direct impact on vessel operations. For vessels that have a history of fishing in both areas in the same year, the Councils may want to consider a mechanism to enable those vessels to continue doing so, with consideration of other factors, such as administration, enforcement and allocation issues. For example, if one area adopts a vessel allocation program, such vessels would likely qualify for an allocation in that area, and would also operate under the same specifications (e.g., DAS and trip limits) as vessels that only fish in one area. If the FMP is split into two, vessels that fish in both areas would either need to be permitted under both FMPs or would be required to change their fishing patterns.

Unless specifically addressed, if the management remains under a single FMP with different rules in each area, permitted vessels would qualify for fishing in both areas since current permits are not area-specific, with the exception of permit category H vessels. If one area adopts a history-based allocation, vessels that have no history in that area would not get an allocation and, thus, would be restricted only to one area. On the other hand, all vessels (those with and those without an allocation) would be allowed to fish in the area that does not have a history-based allocation. This situation would put those vessels with an allocation at an advantage, because they could continue to fish in both areas, while all of the other vessels (those without an allocation) would be limited to fishing only in one area.

Another consideration regards vessels that historically have fished in both areas but not in the same year. These vessels may have a history in both areas due to a change of ownership, change in fishing activities, or other reasons. Such a history could have impacts on the vessel's opportunities under a new regime, if vessel history used for permit qualification or allocation purposes, because it would either only have partial history in an area (negative effect), or have qualifying history in both areas (positive), depending on the specifics of the permit qualification or allocation rules adopted.

Massachusetts presents a unique situation from an operational perspective because its coast abuts both management areas. The Councils will need to coordinate with Massachusetts to address state waters fishing which may occur on both sides of the area boundary. Another consideration is federal waters fishing by vessels from ports, such as Chatham, that are close to the boundary line. These vessels are more likely to have a history of fishing in both areas.

Groundfish Sector Vessels

Groundfish sector vessels have stock specific Annual Catch Entitlements (ACE) which may be leased or traded among sectors. The relationship between the monkfish area boundary and the stock boundaries for a number of groundfish stocks presents a complicating factor for consideration. The maps at the end of this document show the relationship between the groundfish stock areas and the monkfish management boundary, and, in the last map, the statistical areas used in the monkfish assessment of the two stock components. Of the 20 groundfish stocks, only four have stock areas exclusively within

one monkfish area. These are: GOM haddock, GOM cod, GOM winter flounder, and Cape Cod yellowtail flounder; all of these fall within the NMA. Two stocks, SNE/MA yellowtail flounder and Southern windowpane flounder, are almost entirely within the SMA, except for a small area in the northwestern corner of Statistical Area 526 that falls within the NMA (to the southeast of Nantucket). For several stocks the survey distribution is within a single monkfish management area, even though the stock range is assessed as covering both areas, e.g., Statistical Areas 5+. Accommodation would have to be made for sector vessels with ACE for these trans-boundary stocks to fish in both areas, which might include an incidental monkfish permit, an allocation of monkfish for each area, or some other approach (depending on the specifics of the two monkfish management programs).

Permit Qualification and Permit Transfers

If the FMP is split into two, the Councils will need to establish permit qualification criteria for area-specific permits for directed monkfish fishing under each new FMP. The Councils would need to coordinate their respective permit qualification criteria so that all current limited access permit holders would be considered, and they would need to agree on whether vessels would be permitted only in one area, or could be permitted in both. Groundfish sector vessels with ACE for groundfish species that occur in both areas would need some sort of permit to fish in both areas since monkfish is a component of the groundfish catch.

The permitting process could be based on vessel history, or could be done by declaration by the permit holder. If vessel history is used, those vessels that have a history in both areas could potentially qualify for permits under both plans. Depending on the specific management measures that apply in each area, those vessels will either be at an advantage over other vessels because they can fish in both areas, or at a disadvantage because their history in each area will be lower than if they had fished entirely in one area. Alternatively, vessel owners could declare in which area they will target monkfish and would fish under incidental catch rules in the other area, obviating the need to rely on vessel landings history as recorded in NMFS' database, and an appeal process.

The Councils will also want to consider a mechanism to accommodate vessel/permit sales between the areas even if the vessel does not have a history in both areas, unless the Councils decide to prohibit such trades. One question that arises is: if a vessel does not have permit qualification history or history-based allocation in an area, and someone wants to purchase that vessel and apply a qualified permit or allocation so the vessel can fish in the area, what happens to the other permits or allocations that already exist on that vessel? Would that vessel retain its current permits/allocation, in addition to the post-sale permits/allocation, and be able to fish in both areas, or would a condition of the sale be relinquishment of the pre-sale permits/allocation (which the seller could then apply to a replacement vessel)?

Another consideration with future vessel sales and permit transfers arises if one area adopts a catch share management system. Under such a system, the current permit structure becomes obsolete because the vessel would be operating under its individual

quota or ACE, which can be accumulated or reduced through leasing, sale or transfer. The Councils may want to consider retaining the vessel's original permit category so that if the vessel is sold for operation in the area without a vessel allocation system, that vessel would return to its original permit status and operate under the rules applicable to that category.

Socio-economic Considerations

Independent of the specifics of the management programs in each area, there are potential socio-economic issues or impacts to be considered. One of these is the effect on fishing strategies, particularly for vessels that fish in both areas. Another is the impact on vessel/dealer-processor relationships. Currently, vessels can fish in either area in the same season or trip, provided they comply with the more restrictive rules, since DAS are allocated for the entire fishery, with the restriction that vessels may only use a subset of those DAS in the SMA (when the SMA DAS allocation is less than the NMA DAS). Any change to that capability (to fish in both areas) would likely require an alteration to fishing practices as well as business strategies. Whether or not the ultimate outcome of those changes is positive or negative would depend on the specifics of the transition and the final effect on business operations and community networks. In other words, change can be difficult or costly from a socio-economic perspective, but in the end, the benefits may outweigh the costs if the new management regime is an improvement over the old. Communities and business that rely on landings from both areas will need to adjust to the change as well.

If the management program is divided, vessels will either be excluded from one area, or will have to operate under two sets of rules to fish in both areas. If the change results in vessels being excluded from an area, there is a potential for a loss of income. That lost income might be recoverable under the new set of rules depending on the opportunities or allocations under the new regime. In either case, vessels that traditionally fished in both areas will have to modify their fishing strategies.

If the FMP is divided, and vessels can qualify for both areas, there is the additional burden, in terms of time and paperwork, on vessel owners or other interested parties of having to participate in two sets of Council FMP activities (attending two sets of meetings, submitting two sets of comments, etc.). Furthermore, there would the additional compliance, reporting and administrative costs on vessel owners operating under two FMPs. The burden of having to participate in additional management activities also applies to states that have vessels that fish in both areas, particularly Massachusetts which borders both monkfish management areas, in terms of time to attend meetings, travel expenses, staff assignments, etc.

As with any Council action, the supporting documents will need to analyze and discuss the social and economic impacts of proposed changes. These analyses will depend on the specifics of the measures under consideration, relative to taking no action and are usually done once the measures are well developed. Often, however, public comment by interested and affected parties provides early insight into how proposed changes might

affect communities and vessels' and dealers' businesses, positively or negatively. These public comments can be useful to the Councils as they proceed with the decisions on the structure of a future management regime.

Administrative and Enforcement Considerations

Complexity
Whether the FMP is split into two, or there are two different management programs in one FMP, the level of complexity from both the administrative and enforcement perspectives will increase. Having two sets of regulations, for a single species, that potentially impact each other will require that they be developed in a coordinated manner to avoid duplication and unnecessary costs, and to promote ease of compliance both at sea and shoreside. If VMS is required on all vessels, at-sea compliance with and enforcement of area-based regulations may be less problematic.

Furthermore, more complex regulations can create an opportunity to find loopholes or to game the system. While loopholes are legitimate activities that may run counter to the spirit or intent of the plan, complexity also creates an opportunity to engage in illegal activities, when there is sufficient financial incentive to do so, and a perception that the risk of penalty is minimal. To minimize the consequences of plan complexity on enforceability, the Councils may want to engage the enforcement agencies early in the process of plan development to ensure that the resulting regulations are reasonably enforceable.

Catch Monitoring
Since dealers and processors will be handling fish from both areas, fish that were caught under two sets of rules, and, potentially, two distinct jurisdictions, the accurate attribution of catch to the appropriate area is of significant importance. Currently, the assignment of area of catch relies on VTR reports filed by vessel operators. While this has been the standard procedure to date, with multiple jurisdictions, the reporting procedures could become more complicated and burdensome, and there may be greater incentives to misreport, especially if reporting requirements are different in the two FMPs. In addition to potential increased monitoring costs for vessels, there will likely be added enforcement and administrative costs to ensuring the accuracy of area of catch. The Councils will want to coordinate catch monitoring rules so they are consistent between the two areas, and to ensure complete and accurate catch accounting.

In the past, questions have been raised about the veracity of stock area reported on the VTR where multiple areas are fished during a trip. A 2011 paper by the NEFSC's Michael Palmer and Susan Wigley, compared VTR reporting with VMS logs. The authors concluded that "the underreporting of statistical areas on VTR logbooks is a problem that affects greater than 80% of the multi-area trips examined" (Palmer and Wigley, 2011), a conclusion that agrees with other studies of this issue. Not all stocks are equally affected, and it is difficult to predict the impact of this problem in the two-area monkfish management regime, but this is clearly an issue that needs consideration as the

Councils proceed. While the authors noted that the "discrepancies have implications on the estimation of fishery removals and the assessment of these stocks," there are also implications for management under ACLs and AMs, especially when there is significant transboundary fishing.

Agency and Councils Workload
Having effectively two plans (whether or not they are nominally under one FMP) will also increase the workload and administrative costs to NMFS and the Councils due to the two sets of management actions that will have to be undertaken. Currently, the two-area management of monkfish is done under a single action, albeit with different specifications applicable to each area. If the plans are separated, or if the management measures are different under the same FMP, the Councils will be developing two sets of actions. This will require the preparation and review of two amendment/framework documents, including environmental documents, adding to the staffing resources of both NMFS and one or both Councils.

Furthermore, the concurrent submission of two actions or two distinct sets of rule changes, will likely require that the documents be submitted with greater lead time than is currently needed due to the document preparation and review workload of the staffs. Adding to lead time will be the need to resolve any inter-area allocation or management decisions, particularly if the two areas are dividing a single stock, or two stocks with substantial mixing. This extended lead time will place greater distance between the time when fisheries data is collected that forms the basis of the specifications and the time those specifications are implemented, which means that management measures, including quotas will not be based on current stock conditions but those at the time the data is collected. If a stock assessment is conducted during that period, even more time will pass before the regulations become effective.

ACL and AM Considerations

One of the potentially most difficult aspects of splitting the management of monkfish into two separate regimes will be the allocation of monkfish ACL to the two areas, particularly if the resource is determined to be a single stock, or two stocks with substantial mixing. If the FMPs are managed separately by the two Councils, a mechanism will need to be established to resolve the overall allocation on a periodic or annual basis.

One approach to the overall stock allocation between two Councils could be some sort of trans-boundary negotiation group, modeled after the TMGC used in US/Canada shared stocks management. If the FMP remains under the NEFMC administrative lead, the Monkfish Oversight Committee, with membership from both Councils, could conduct those negotiations and divide the ACLs, perhaps with guidance from the SSC. This approach, whether within one Council or between Councils, would add to the time required in the specifications-setting process, since such negotiations would have to take place after any stock assessment results are finalized (and new ACLs are calculated), and with sufficient lead time for NMFS review and rule-making. Potentially, however, this

could be done on a multi-year basis to minimize the time and resources needed to complete all the steps in the process.

Whether the FMP is split into two, with separate lead Councils, or whether it remains under the current structure but with different management regulations, once the ACL is apportioned, the FMPs will need to adopt area-specific accountability measures. The Councils should be aware, in designing the AMs, that if one area is subject to restrictive AMs due to an ACL overage, there is the potential for effort to shift to the other area to avoid being subject to those restrictions, and subsequently risk overfishing in both areas.

Conclusions

- The weight of current scientific evidence suggests a single stock in U.S. waters, or, if more than one stock, mixing is likely extensive.
- There are no legal impediments to managing a single stock as two separate units, either with different rules within one FMP or as two FMPs, but the Councils would need to coordinate management between the two areas, and also provide sufficient justification to NMFS that the separation is consistent with National Standards and their Guidelines.
- A substantial number of vessels currently catch monkfish in both areas, either as a directed fishery or incidentally in the same year. The Councils would need to consider how to address the operational aspects of vessels that rely on access to both areas.
- Massachusetts' coastline borders both areas which presents unique operational and administrative considerations.
- Groundfish Sector vessels with ACE for groundfish stocks whose stock areas fall on both sides of the monkfish boundary will need consideration to allow, minimally, for incidental monkfish catch in both areas.
- Permit qualification based on history in an area raises considerations with regard to the history of fishing in both areas by a substantial number of vessels, within each year or year-to-year. An unknown number of vessels have historically fished in both areas in different years, making them potentially advantaged or disadvantaged in any history-based permit qualification or allocation. Without a careful evaluation, it is not yet clear how complete catch/landings data are for determining possible allocations by area. If the FMP is split into two, with separate area-based permits, the Council will need to accommodate future vessel sales and permit transfers between areas, including, the disposition of other permits associated with a transferred permit.
- From a socio-economic perspective, the two approaches under consideration will both require vessels to change their fishing and business strategies, especially those vessels that fish in both areas during the year, which will potentially impact income and relationships with dealers and processors. If the FMP is split into two, and a vessel qualifies for permits in both areas, there will be additional time,

paperwork and administrative burden on vessel owners to comply with two sets of rules and participate in two plan development processes.

- Both approaches under consideration will likely increase the complexity of the FMP(s), add to the administrative burden on and workloads of NMFS, the Councils, and the states, especially Massachusetts which borders both areas. While having two sets of rules will add to the enforcement burden, that impact could be mitigated if the new rules are more enforceable than the current ones. Catch monitoring will need to be enhanced as a consequence of area specific ACLs and associated AMs.
- Under a single biological stock, sub-ACLs will need to be negotiated between the two areas, and area-specific accountability measures will need to be established so one area does not become accountable for overages in the other area.

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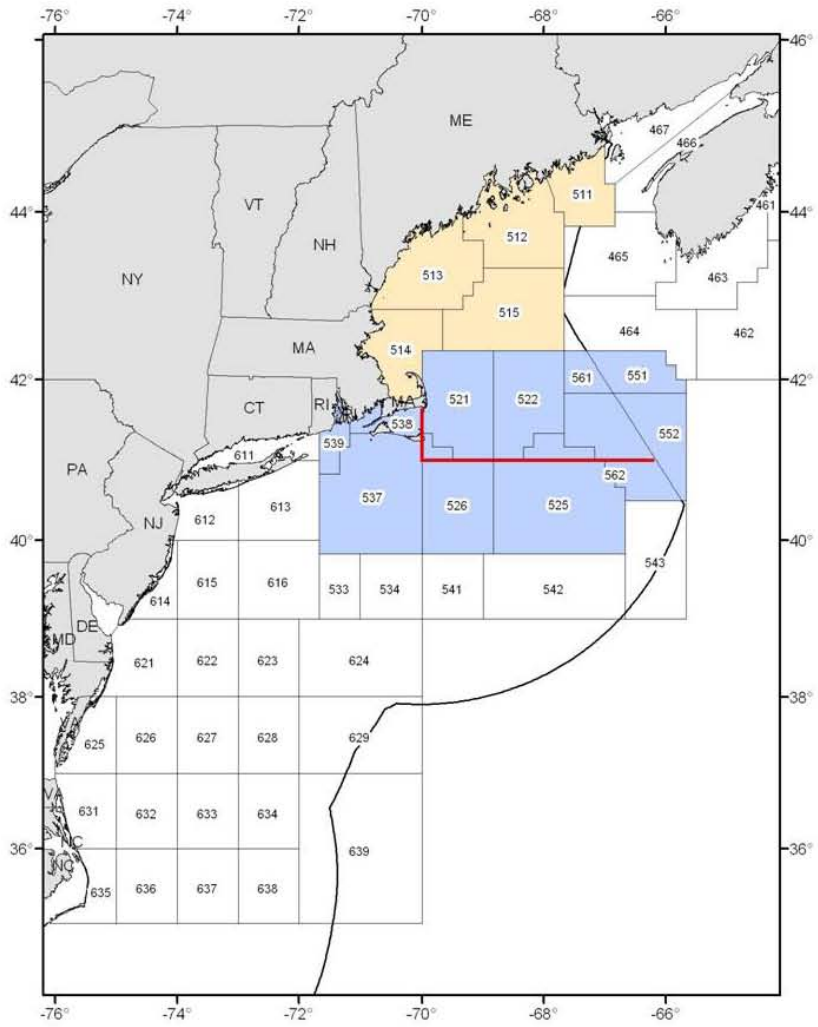
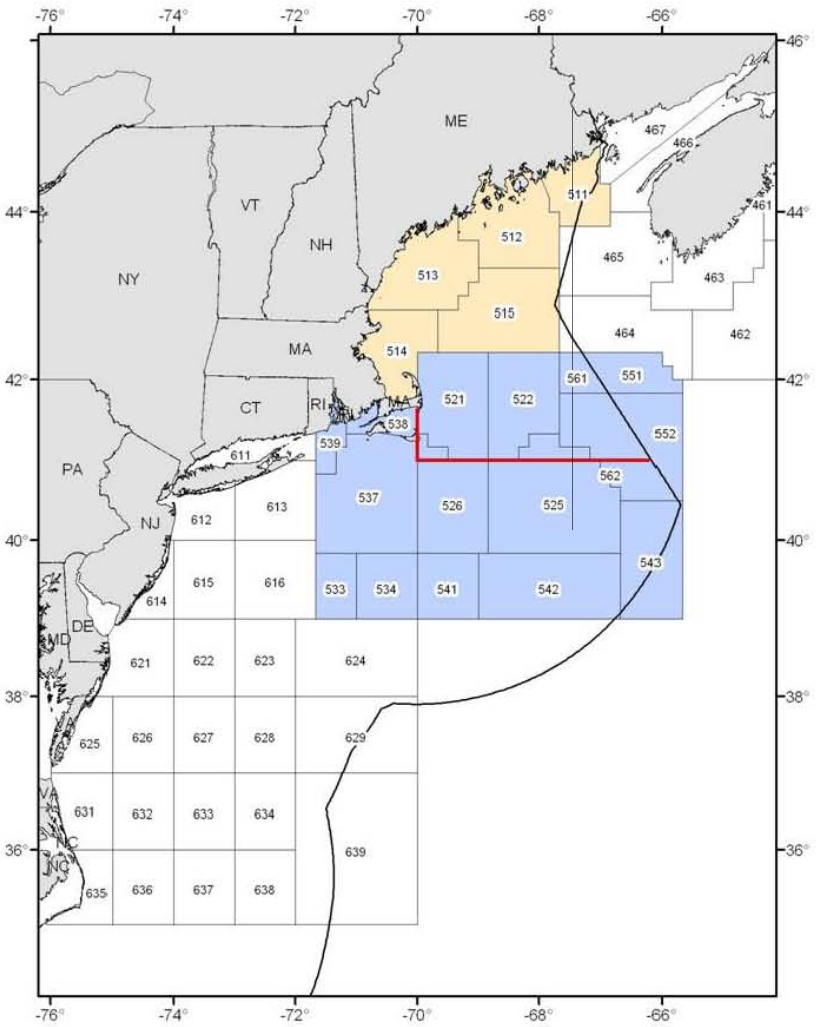


Statistical areas for Atlantic cod



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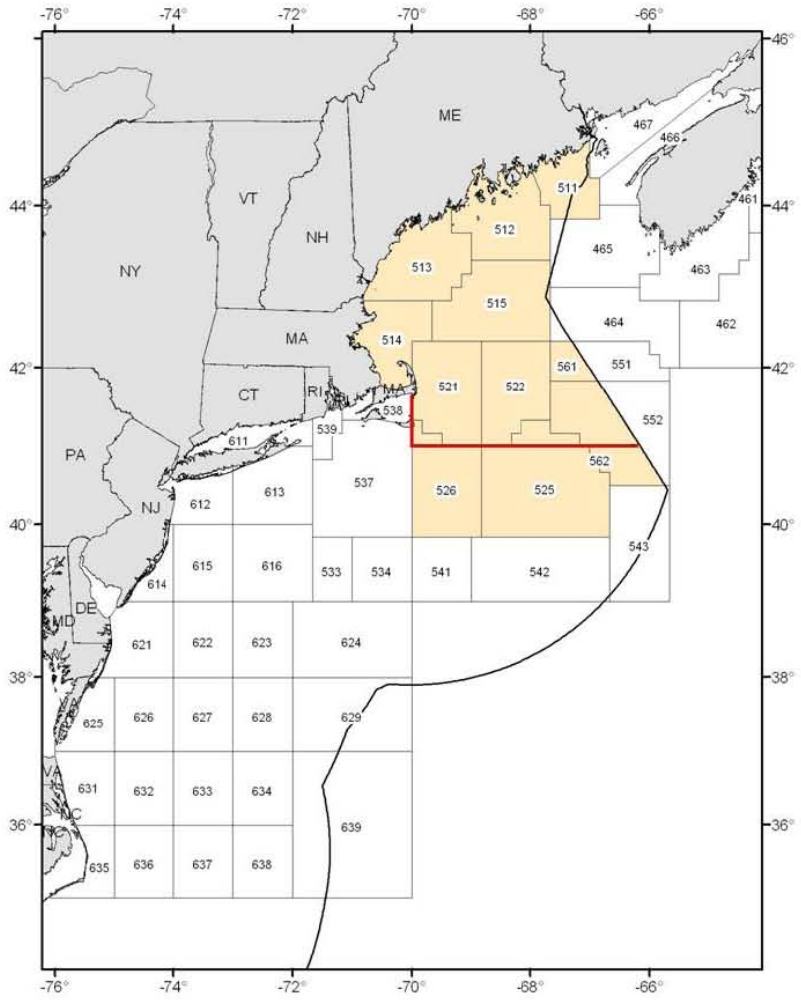

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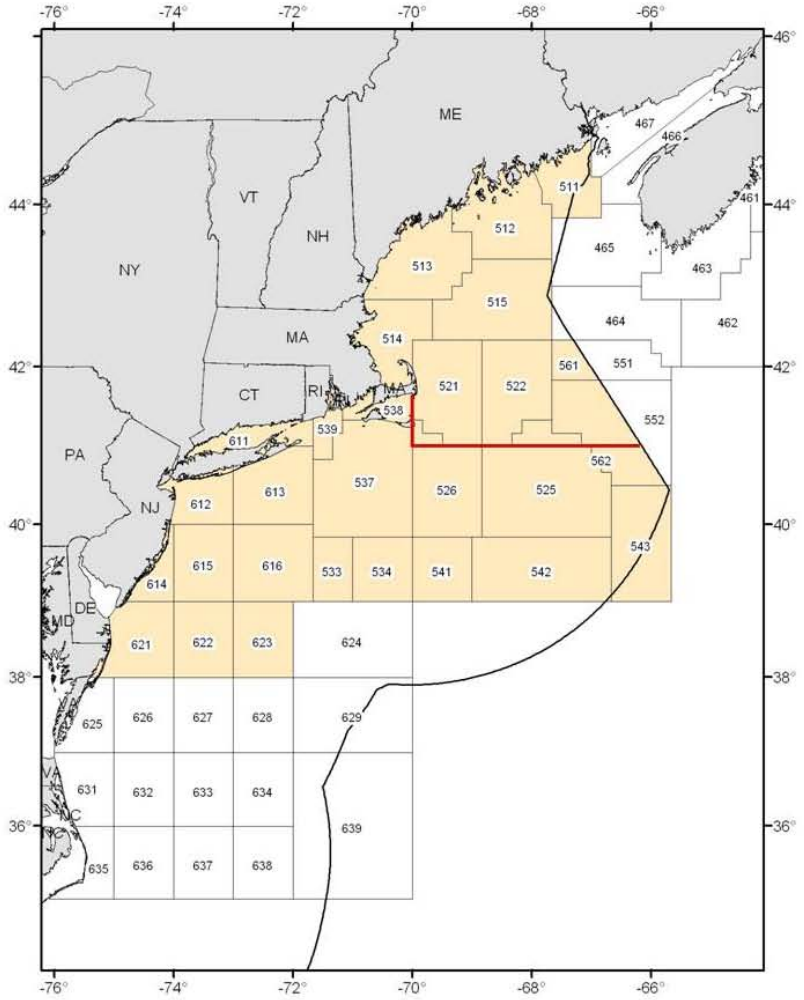

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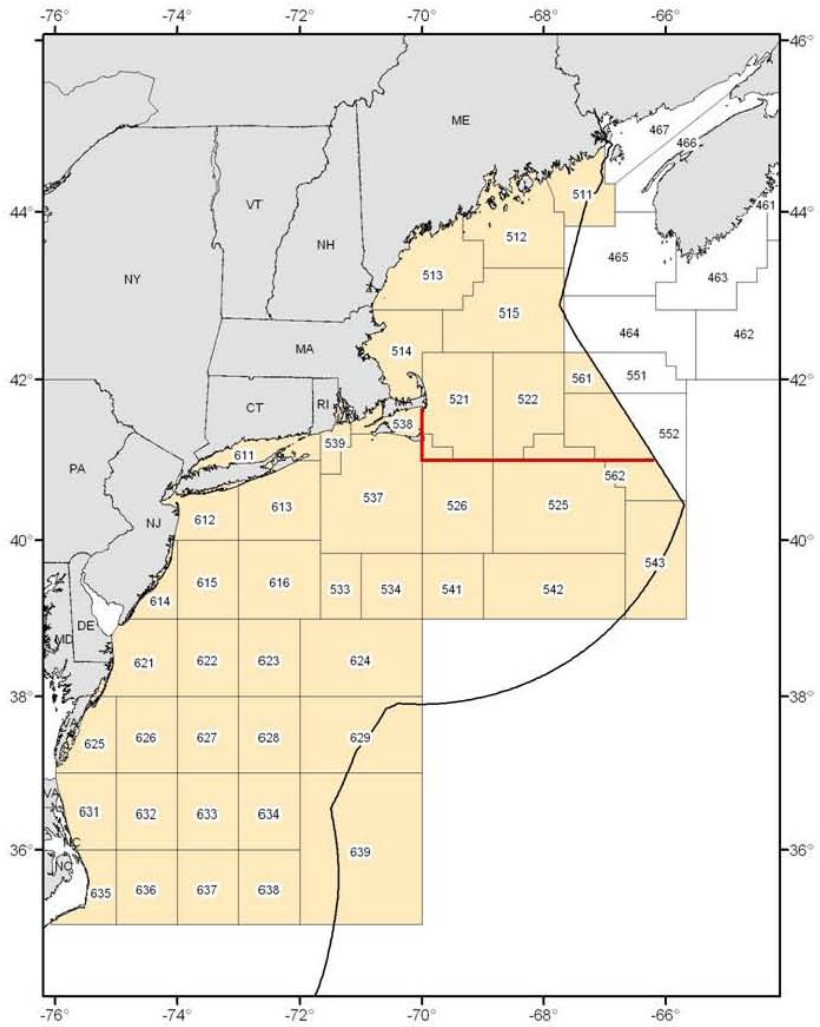

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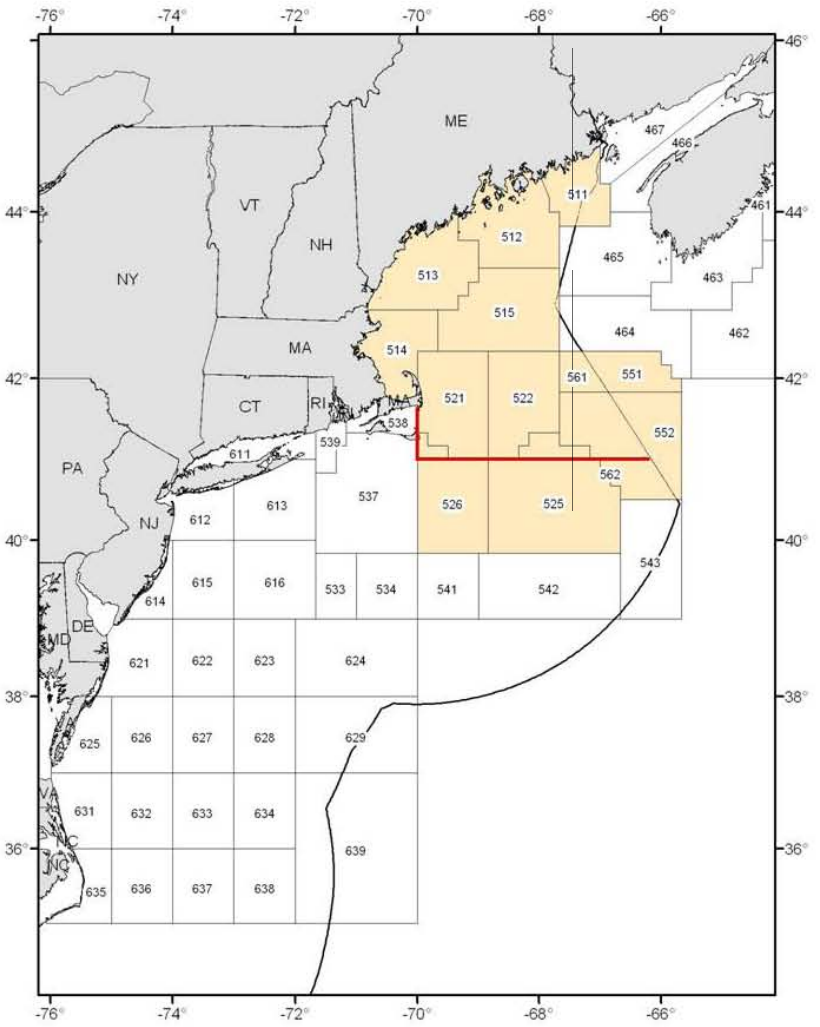

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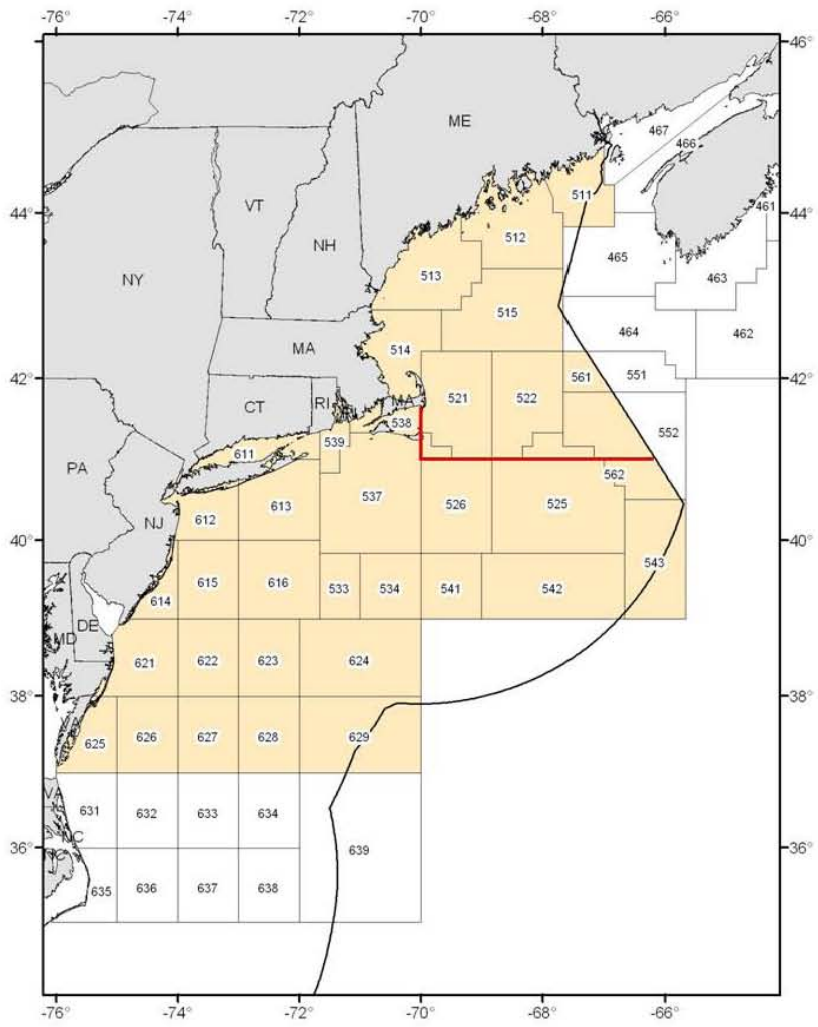

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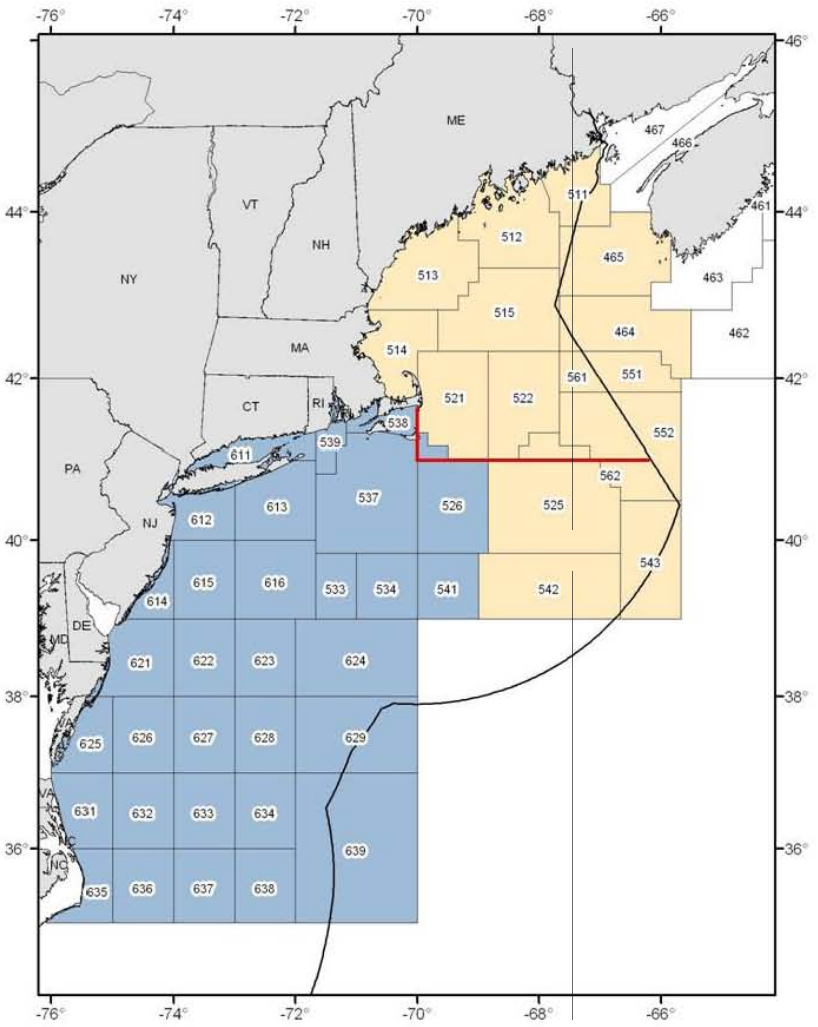

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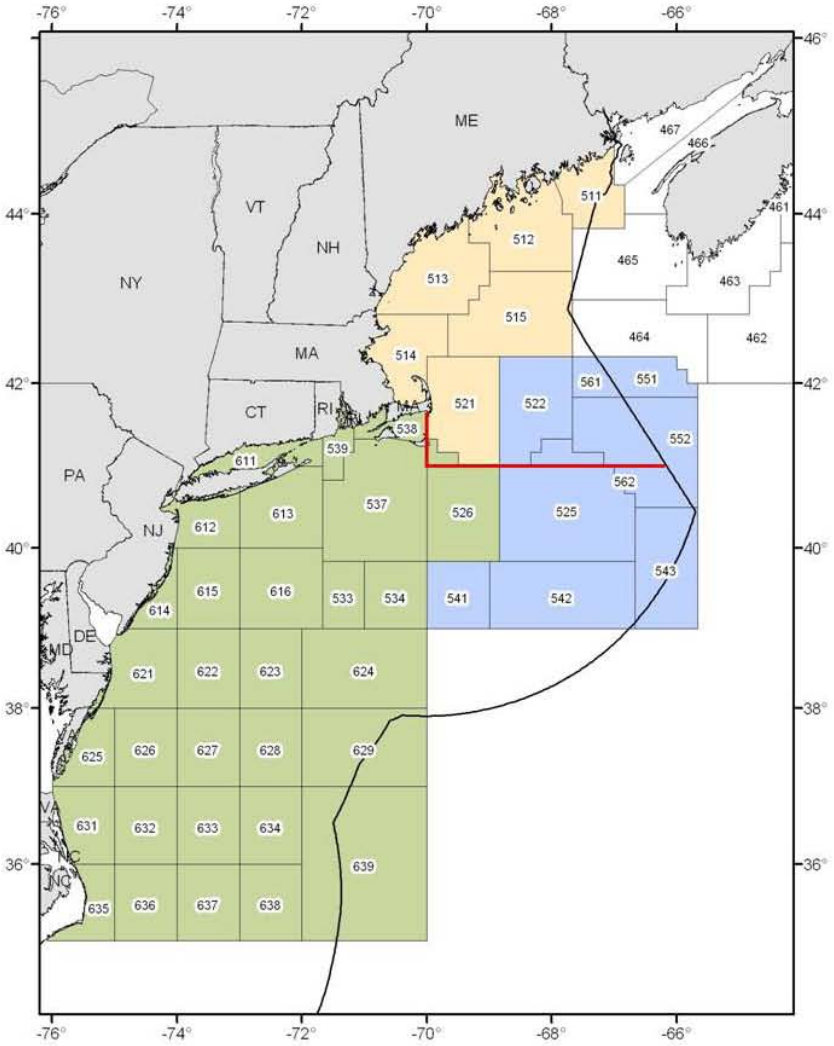

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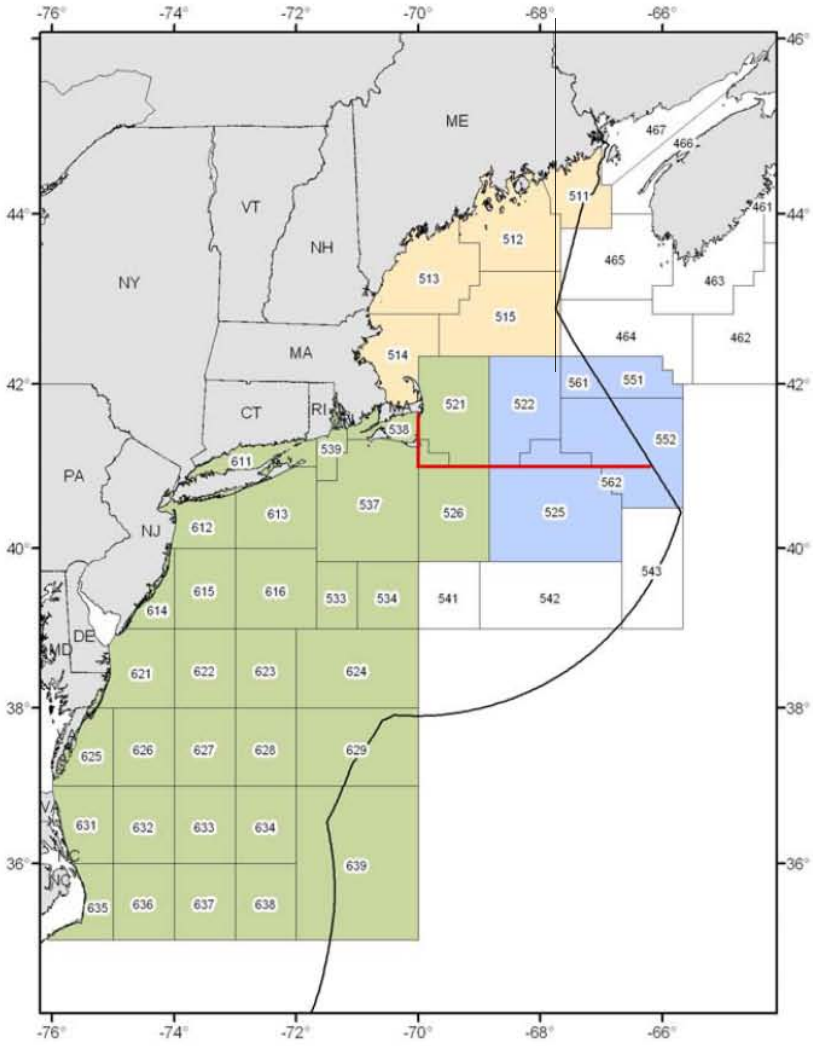

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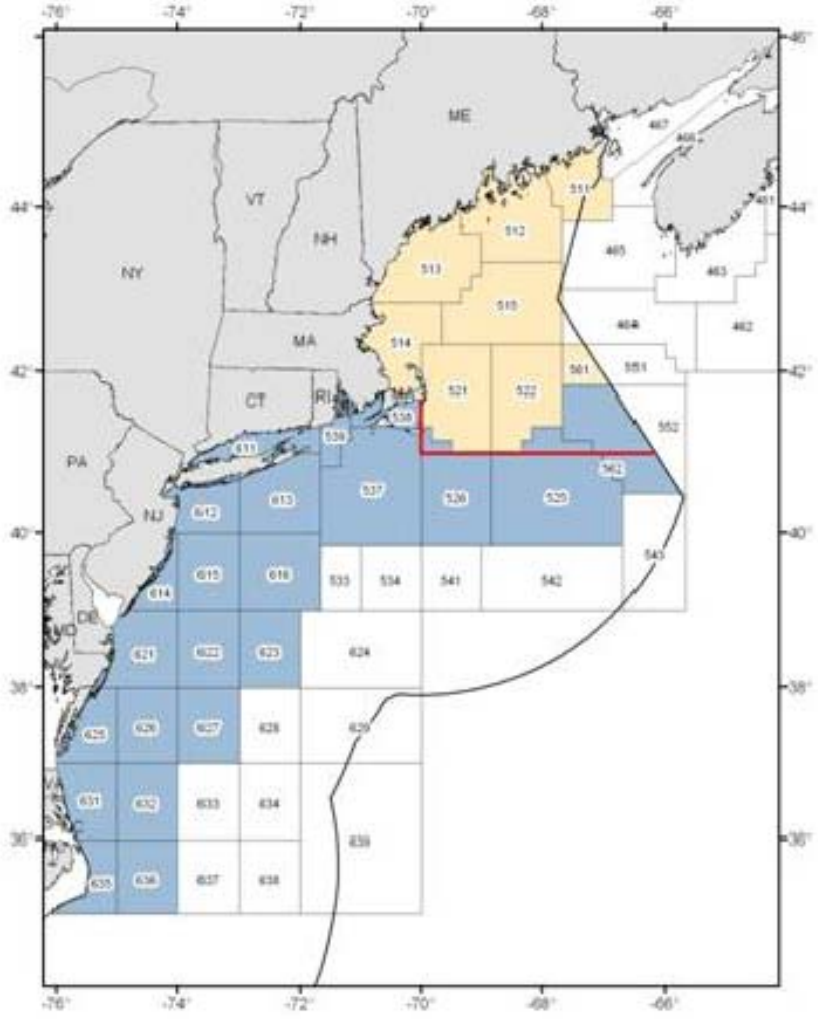

Statistical areas for monkfish