MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

MEMORANDUM

DATE: March 30, 2015

TO: Council

FROM: José Montañez, Staff

SUBJECT: Review of Golden Tilefish 2016 Specifications and Framework 2 Timeline Update

As part of the 2015-2017 multi-year specification process for Golden Tilefish, the Scientific and Statistical Committee (SSC) and Golden Tilefish Monitoring Committee (MC) reviewed the most recent information available to determine whether modification of the current 2016 specifications is warranted.

The following materials are enclosed on this subject:

1) Report of the March 2015 Meeting of the MAFMC SSC
2) Report of the March 2015 Meeting of the MAFMC Golden Tilefish MC
3) Golden Tilefish Fishery Performance Report (February 2015)
4) Golden Tilefish AP Information Document, Council Staff (February 2015)
5) Golden Tilefish Data Update, NEFSC (February 2015)
6) Staff Recommendation Memo to Chris Moore (February 2015)

A brief update on the issues for consideration and timeline for Framework 2 to the Golden Tilefish FMP will be presented.

Report of the March 2015 Meeting of the MAFMC SSC

See Tab # 15

Golden Tilefish Monitoring Committee
Webinar Meeting Summary
March 26, 2015

Attendees:

Steve Heins (NY-DEC), Douglas Potts (GARFO), Paul Nitschke (NEFSC), Tom Baum (filling in for Jeffrey Brust, NJ-DFW), and José Montañez (Council Staff). Others in attendance: Laurie Nolan (Golden Tilefish Fishing Industry and Council Member), Joshua O'Connor (NOAA Port Agent, Cape May, NJ), Kiley Dancy (Council Staff).

Discussion: The Golden Tilefish Monitoring Committee was presented with a summary of the SSC deliberations of the March 2015 SSC meeting, where the SSC reviewed the Golden Tilefish Data Update, the 2015 Golden Tilefish Advisory Panel Fishery Performance Report, and the 2015 Golden Tilefish Advisory Panel Information Document. Based on the updated information presented, the SSC saw no compelling evidence to change its recommendation of ABC = 861 mt (1.898 m lb) for fishing year 2016. The monitoring committee discussed the different components of the tilefish catch.

Tilefish monitoring committee comments and recommendations:

Annual Catch Targets and Basis for Derivation

Based on the updated information and SSC deliberations, the Monitoring Committee saw no compelling evidence to change the annual catch targets and basis for derivation for 2016. The Tilefish Monitoring Committee had previously recommended an annual catch target (ACT = ACL) of 861 mt (1.898 m lb) for 2016. The committee recommended the total allowable landings (TAL) be reduced by 5 mt (0.011 m lb; average combined discards of tilefish for 2010-2012 for the large and small mesh trawl and gillnet gear)[1] from the ACT to account for commercial discards. The TAL recommended was 856 mt (1.887 m lb) for 2016. All catch levels and landings limits are shown in Table A at the end of this document.

Relevant Sources of Management Uncertainty

Past sector-specific performance and catch performance can be used as a basis for qualifying management uncertainty (implementation error), and as an indicator of future availability to achieve the 2015-2017 ACTs.

[1] Source: Northeast Fisheries Science Center. 2014. 58th Northeast Regional Stock Assessment Workshop (58th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 14-04; 784 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://nefsc.noaa.gov/publications/.

The commercial fishery landings performance has been in line with expectations and the Monitoring Committee recommends that an adjustment to address this aspect of management uncertainty is not necessary. The Monitoring Committee noted that IFQ vessels have been landing nearly the entirety of the IFQ. Furthermore, since the IFQ system became effective, tilefish landings are closely scrutinized. The incidental fishery landed less than 45,000 lb (45% of their allocation) last year, and this year the landings trajectory is near identical when compared to last year's landings trajectory.

Commercial Discards

Development of a time series of discards was not done in the assessment model since discarding was considered negligible and information on discards do not exist for most of the time series. Very low or insignificant discards were estimated in other fisheries (incidental tilefish fisheries). There is higher uncertainty (high CVs) on the low recent discard estimates since the discarding of tilefish is a rare event on observed trips. Therefore, an average of several years was used to judge the recent relative magnitude of discarding in other fisheries. Following the process created by the ACL/AM Omnibus Amendment, the monitoring committee adjusted the TAL from the ACT using average annual discards for 2010-2012 as presented in the Golden Tilefish SAW 58 document (5 mt or 0.011 m lb). The Monitoring Committee saw no compelling evidence to change the discard estimates used to derive the TAL.

The Monitoring Committee also discussed that the commercial discards are not generated by the IFQ fishery, which prohibits discarding. It was also discussed that Framework 2 consider modifying the tilefish catch and landings flowchart to deduct discards after the ACT is divided between the IFQ and incidental categories as this would allow for commercial sector specific adjustments. Depending on how Council staff progresses with the development of Framework 2 and how the rule making process progresses, it is possible that any revisions/modifications to the current golden tilefish catch and landings flowchart could be implemented by November 1, 2016 (2017 fishing year) or earlier if possible (e.g., during the 2016 fishing year).

Other Management Measures

Incidental Trip Limit

The Monitoring Committee also discussed the industry's concern regarding the potential for non-trawl vessels using the incidental trip limit to target tilefish since the incidental trip limit was changed from 300 lb to 500 lb in fishing year 2012[2]. More specifically, there is a concern that the 500 lb trip limit may increase the number of vessels and trips fishing for tilefish (especially for non-trawl gears). There is a tradeoff between increasing discards of tilefish as bycatch in other fisheries when the trip limit is too low and creating incentives for targeting tilefish when the trip limit is too high.

The Monitoring Committee discussed the issues raised by the AP members[3] regarding their concerns about directed trips in the incidental category by non-trawl vessels. The AP members are recommending that

[2] 300 lb whole weight (275 lb gutted) to 500 lb whole weight (458 lb gutted).
[3] Recommendation made when the AP members developed the 2015 Golden Tilefish FPR (February 24, 2015).

the Council review the management aspects of the incidental fishing category. More specifically, it was suggested by several industry members in the 2015 FPR that additional restrictions on landing incidental tilefish be developed. For example, that a certain amount of Mid-Atlantic or New England managed species would have to be landed on trips where incidentally caught tilefish was landed. Essentially, each trip would have to be a directed trip on other species as was the intent in the original FMP. The AP would like to see this issue addressed in the next framework document (Framework 2).

Incidental Trip Limit Background - When the Tilefish FMP was implemented, a 300 lb incidental trip limit was adopted. If the incidental category landed more than 5 percent of the TAL for a given year, the Regional Administrator could reduce this limit the following fishing year. In addition, The Regional Administrator will monitor the harvest of the tilefish incidental TAL based on dealer reports and other available information, and shall determine the date when the incidental tilefish TAL has been landed. The Regional Administrator shall publish a notice in the Federal Register notifying vessel and dealer permit holders that, effective upon a specific date, the incidental tilefish fishery is closed (in-season closure of the incidental fishery) for the remainder of the fishing year. The incidental trip limit was increased to 500 lb (fishing year 2012) with the implementation of the Omnibus Amendment developed by the Council to comply with the ACL and AM requirements of the MSA. The Council thought that increasing the trip limit in the commercial tilefish incidental fishery from 300 lb to 500 lb would not change fishing practices and that discarding of tilefish would be reduced.

The Monitoring Committee discussed the concerns raised by the industry and recommended no change to the incidental trip limit at this time given available incidental fishery landings information and the fact that the incidental category landings have been approximately between 45-55 percent of the category quota during the last 5 fishing years. The Monitoring Committee did not make a specific recommendation for the Council to include a stipulation on trip catch composition (golden tilefish could not be a major component (X%) of the catch on incidentally permitted trips) in Framework 2 as suggested by the AP members in the 2015 FPR, and that it was up to the Council to incorporate this into the Framework if they wish to do so. A trip catch composition requirement could help insure that golden tilefish is truly an incidental non targeted component of the trip as was intended by the original FMP. However, this requirement would likely also need to be monitored for it to be an effective measure.

The Monitoring Committee also recommended that landings in the incidental fishery continue to be closely monitored for signals that targeting is occurring. If there is a future believe that there is potential for abuse of the intent of the incidental category trip limit, then the AP's advice regarding additional restrictions on that category should be considered. While this may not be a current major mortality problem, allowing incidental vessels to target golden tilefish goes against the spirit or intent of the incidental fishery regulations.

Recreational Bag Limit

The Monitoring Committee is concerned about the increase in recreational landings and those landings potentially becoming significant. The Monitoring Committee also noticed that the golden tilefish landings in the for-hire sector (not including private sector) may be similar in magnitude to the commercial incidental landings. If the recreational landings continue to grow, the Monitoring Committee recommends that the Council consider an explicit allocation to the recreational fishery in a future amendment. There are no recommendations to change the 8-fish recreational bag-limit per person per trip as the Committee felt that they did not have sufficient information or analysis to recommend a specific bag limit other than status quo.

Table A. Summary of the SSC and Monitoring Committee recommendations for catch and landings limits for golden tilefish for 2016.

	2016	Basis
OFL	2.343 m lb (1,063 mt)	Projection
ABC	1.898 m lb (861 mt)	Projections/ Council Risk Policy
ACL	1.898 m lb (861 mt)	ABC = ACL
ACT	1.898 m lb (861 mt)	Deduction for Management uncertainty = 0
Discards	0.011 m lb (5 mt)	Avg. discard (2010-2012) sm/lg mesh OT and gillnet gear
TAL	1.887 m lb (856 mt)	
RSA	0	0
Quota - IFQ	1,792,799 lb (813.2 mt)	95% of the TAL
Quota – Incidental	94,357 lb (42.8 mt)	5% of the TAL

2015 Tilefish Advisory Panel (AP)
Fishery Performance Report (FPR)

The Tilefish AP met via Webinar on February 24 2015 to develop the Tilefish FPR below. This FPR represents a consensus of the Tilefish AP.

The Advisers in attendance were: David Arbeitman, Ron Callis, Dan Farnham, Skip Feller, and Michael Johnson. They represent tilefish commercial fisherman (from New York and New Jersey) and recreational fishermen (private and head boats; from New Jersey, Maryland, Virginia). Also in attendance were Laurie Nolan, Council Member; Doug Potts of the NERO; Paul Nitschke and Barbara Rountree of the NEFSC; Danny Farnham, and Ernie Panacet, general manager of Viking Village, NJ, and José Montañez (Council Staff).

The charge to the Tilefish AP was to provide input on factors that have influenced catch levels over time. The following is the consensus report from the Tilefish AP.

Market Issues

Prices have increased and been strong in recent years. A major reason for this is that the tilefish industry is able to coordinate times of landings to avoid market gluts and spread tilefish landings throughout the year. The ability to do this has improved since IFQs came into place.

The price for Golden tilefish decreases when tilefish landed in the South Atlantic derby fishery enters the New York market. This typically occurs a few months out of the year as the South Atlantic tilefish fishery typically closes early in the season, due to its being a 'derby' fishery. It is likely, that as the South Atlantic Golden Tilefish Quota increases[1] and additional Golden tilefish caught in the south Atlantic enters the Fulton market, the downward pressure on the price of tilefish caught in the mid-Atlantic region will become more relevant. In addition, in late fall, striped bass also competes with tilefish in the market place. Fishermen take this into account when planning fishing activity. The adverse effects on golden tilefish prices in the Mid-Atlantic region due to South Atlantic tilefish entering the Fulton Seafood market lessened in 2015 fishing year due to the fact that the Mid-Atlantic commercial tilefish quota was reduced by 12% in 2015, the increase in tilefish popularity and demand (year round demand), and the severe winter weather which affected landings in the mid-Atlantic.

Golden tilefish caught in this region are sold as whole fish through regional markets, mainly for ethnic customers. However, an increasing although small amount is going to local buyers on Long Island, where there has been an uptick in local restaurants featuring such local fishes as well as purchases by a Sea-to-Table business serving the larger region (sea2table.com).

[1] Effective October 9, 2012, the commercial Annual Catch Limit (quota) for golden tilefish increased from 282,819 pounds (gw) to 541,295 pounds (gw), 135,324 pounds (gw) allocated to the hook and line fishery and 405,971 pounds (gw) allocated to the longline fishery. As of 2/20/2015, the longline fishery was closed. Source: http://sero.nmfs.noaa.gov/sustainable_fisheries/acl_monitoring/commercial_sa/index.html

Having a steady year round supply has helped the overall marketing development for this product. (And price increase). The market may not be able to absorb larger increases in product availability in the very short-term. At this time, an increase in supply causes a decrease in price, as seen when southern tilefish enters the New York market. Market expansion is needed to further place additional product in the market place and maintain stable prices. Over the longer-term, increases in production can improve markets.

Major costs that have risen in recent years are fuel, bait, and food. The high cost of operating a vessel continues to place a premium on fishing as close to home port as possible.

Environmental Issues

The industry has observed no tilefish aggregation changes due to changes in water temperatures, in contrast with what they observe with other fishes. The temperatures where Golden tilefish are found seem stable due to extreme depth. (Note: tilefish are generally found in rough bottom, small burrows and sheltered areas at bottom water temperatures ranging from 48.2^{o}F to 57.2^{o}F [9°C to 14°C], generally in depths between 328 and 984 ft [100 to 300 m]).

Dogfish interaction reduces tilefish catches and strongly affects where people fish. When fishermen encounter dogfish they move to other fishing areas. The dogfish interaction is mostly in the winter period. However, in recent years, dogfish presence extends past the winter time period (right until June). Skate interaction also reduces tilefish catches; this is mostly limited to the winter period. Skates can severely damage tilefish gear. When fishermen encounter dogfish or skates they move to other fishing areas.

While adverse weather conditions (e.g., storms, rough seas, high winds) can impact fishing operations year round, the severe winter conditions experience in the Northeast in 2014 and 2015 significantly affected the effectiveness of tilefish fishing operations/practices, resulting in longer fishing trips that recently experience in the fishery.

Recreational tilefish fishermen have observed aggregations of large fish in small areas in the spring/summer time around the Wilmington canyon (>80 to 90 fathoms). Not sure if they could be spawning events. Down East, tilefish concentrate in smaller amounts because of canyons and bottom structures. Advisors indicated that while this type of large fish aggregations have been observed in the past by commercial fishermen, they are now increasingly noticed by recreational fishermen as the popularity of tilefish increases. Mayor factors such advertisement for tilefish fishing trips, tilefish availability, product taste, and the increasing regulations in other recreational fisheries have played a major role in the expansion of the recreational fishery.

Management Issues & Management Induced Effort Shifts

The number of tilefish vessels participating in the fishery has been steady. Data showing a slight increase between 2013 and 2014 reflect participation changes in the incidental category. Since the onset of the IFQ management system, there has been no change in the number of vessels (4) that constitute the vast bulk of the landings (they constitute about 80% of the landings/IFQ allocation).

Tilefish landings are in alignment with the TAL specified for the fishery; observed differences in the data are very small. AP members believe that they are catching their allocation. It is believed that tilefish landings for the 2014 FY (1.847 m lb) reported in the Golden Tilefish AP Information Document are an underestimate of the landings and are likely to be closer the quota limit (1.995 m lb). It is believed that some of the reported underage (0.148 m lb) may be due to late reporting. In addition, one ITQ boat may have also accounted for some of the 2014 underage as it did not land entire allocation due to mechanical and physical issues.

The implementation of the IFQ system has particularly benefited those in the former "part-time" and "tier 2" vessel categories of the old limited access program. These vessels can plan their fishing activities throughout the year, rather than being forced into a derby fishery on November 1 (start of the fishing year) if they plan to harvest tilefish in a given year. These vessels participate in a number of fisheries (e.g. monkfish, scallop, and swordfish) and the IFQ system allows them to "fill in" tilefishing when it works best for them. Under the IFQ system, the former "part-time, tier 2, and full-time" vessels are working closely with each other and dealers to avoid landing large quantities of tilefish at the same time and avoid drastic price reductions.

One panel member indicated that even smaller participants in the tilefish IFQ fishery (smaller in terms of IFQ allocation and/or boat size) have greatly benefited from the IFQ management system as the can better plan their fishing operations (fish when and where they need to) and the fact that tilefish prices are relatively good and stable, and in fact, a large proportion of their ex-vessel revenues come from tilefish.

General Fishing Trends

While CPUE has decreased according to the data update, AP members wanted to point out that for the last two winter seasons (Jan-March, 2013/2014) fishing practices have been impacted by severe weather resulting in longer fishing trips than on average. In fact this trend has continued in the early part of 2015. Panel members indicated that while the number of fishing days per trip (days absent per trip) have slightly increased from about 6.5 days per trip in 2012 to 8.0 days per trip in 2014, it is likely that this increase in would have been smaller if winter weather conditions would had been less severe. Severe winter conditions in the last two years (and in the early part of 2015) have made fishing less productive and longer than average as fishing operations are significantly impacted.

On advisor indicated that during bad weather the window of opportunity to get out slightly decreasing for some vessels. One panel member indicated that since he has a lower allocation he spends a little bit of time exploring fishing grounds to harvest more valuable fish according to market demands. This in turn may also affect CPUE. Two boats indicated that they have a new captains and this may be affecting the catch rates for these vessels. In this small fishery small changes can result in large impacts.

In 2014 a large increase of extra small and kittens size fish (<2 lb) were landed compared to 2013. This observation is consistent with the information provided in the data update.

Observations indicate new incoming multiple-year classes; there is more of a size mix than before (healthy mix of ages). Commercial fishermen are catching a broad size distribution of fish.

Try to fish as close to port as possible. Basically, fishing in same areas all of the time; high fuel prices keep people from going further out and searching.

Fishermen are not moving around much as they are finding a healthy mix of animals in traditional fishing grounds. However, there are areas that are thought to have more quantities of larger fish than smaller fish that could be targeted if needed.

The topography of the traditional fishing areas is well known and they have the advantage of little or no gear conflict, unlike some of the potential tilefishing areas which are used for other fisheries.

Other Issues

-Sometimes, a vessel may underharvest its quota allocation due to fear of overharvesting. The AP would like to see carry-over of unused portions (with a small proportion of the cap) to the next fishing year such as it is done in the scallop fishery. It was also stated that having a carry-over of unused quota may benefit vessels that may not be able to land their entire allocation in one fishing years due to vessel repairs and maintenance.

-Reliance on fishery-dependent data to manage the fishery may be a drawback. Assessment is data poor. No survey information on size distribution.

-Recently, the NMFS added a new code to the dealer data in order to allow fishermen to report landings of tilefish in the large/medium market category (5-7 lb). These are fish that were previously landed under the unclassified market category as there was no large/medium code in the landings data base. It was noted that in 2014 (first full year of the large/medium market category implementation), the bulk of the landings that would have been reported under the unclassified category are now reported under the large/medium market category. Industry estimates that this trend could be extrapolated to the early 2000s when the industry first developed the large/medium market.

-Constant harvest strategy worked well in rebuilding the fishery. Industry would like to see status quo landings in the near future given healthy trends in the catch.

-One headboat captain indicated that 5 headboats[2] directly fish for tilefish but not 100% or full time. In addition, boats may catch tilefish while targeting tuna or swordfish (i.e., when the tuna limit has been reached, on the way out or on the way in from a tuna/swordfish fishing trip, or at any time when tuna/swordfish fishing is slow). During the winter period there are no tilefish party/charter boat trips as dogfish are just too abundant.

[2] 2 from New Jersey, 1 from New York, 1 from Ocean City, MD (direct tilefish but only a few time per year), and 1 from Rudee Inlet, VA.

-Panel members raised concerns and questioned the tilefish catches reported in the NMFS recreational statistics database as they are inaccurate and unreliable. It was recommended that this type of data is not use for the management of this species. It was also stated that recreational values reported under the VTR data seems to be more realistic of tilefish catches.

-One headboat captain fishing out of Rudee Inlet indicated that while they do not run tilefish fishing trips they catch them sometimes (they target blueline tilefish and groupers). However, they have noticed that they are not seeing as many large golden tilefish (>25 lb) as they used to. He also indicated that they are not seeing as many large blueline tilefish as before either. This could be an issue with fishing pressure he stated. The group discussed the fact that fish in the southern canyons (Norfolk, Washington) tent to aggregate in "smaller spots" of about 2 or 3 football fields in size and fishing pressure can be too much and need to wait several months before you go back there to fish again. The group discussed how this contrasts with the wide open areas where the commercial fishery operates in in the northern part of the range (e.g., statistical area 537 - Atlantis and Block Canyons; statistical area 616) where tilefish are found in wide open areas in contrast to "smaller spots" where some recreational fishing occurs in the south. Commercial fisherman indicated that the Montauk fleet has seen an increase in the amount of blueline tilefish caught (ranging from 0 to 100 lb per trip in the last four years)[3] and that the recent decrease in the amount of large blueline tilefish found in the south (i.e., Rudee Inlet) may be due to warmer water temperature and changing migratory patterns. Blueline tilefish harvested by the Montauk fleet are shipped to the Fulton market.

-Advisors are concerned about directed trip in the incidental category by non-trawl vessels. The AP members are recommending that the Council reviews the management aspects of the incidental fishing category. More specifically, it was reported by several industry members that there may be individuals fishing for tilefish using incidental permits that are not actual commercial fishermen and that they are not landing and reporting tilefish caught legitimately thru a dealer. The AP suggested that the stipulation of qualifiers for the issuing of incidental tilefish fishing permits be developed. For example, that a certain amount of Mid-Atlantic or New England managed species would have to be landed each trip that any incidentally caught tilefish was landed. Essentially, each trip would have to be a directed trip on other species as was the intent in the original FMP. The AP would like to see this issue addressed in the next framework document (Framework 2).

-The AP members indicated that the landings monitoring program of the ITQ system is very reliable. In all, there is good accountability mechanisms to track landings in the directed commercial fishery (IFQ vessel) and VTR data (commercial and recreational vessels). However, it there is concern that directed incidental trips (non-otter trawl vessels) may be missing. In addition, there is no accurate information of catch/landings by private recreational anglers.

[3] One industry member indicated that 1,500 lb of blueline tilefish were landed during a directed golden tilefish trip once in a 35 year period.

Golden Tilefish Advisory Panel Information Document[1]
February 2015

Management System

The Fishery Management Plan (FMP) which initiated the management for this species became effective November 1, 2001 (66 FR 49136; September 26, 2001) and included management and administrative measures to ensure effective management of the tilefish resource. The FMP also implemented a limited entry program and a tiered commercial quota allocation of the overall TAL. Amendment 1 to the Golden Tilefish FMP created an IFQ (Individual Fishing Quota) program that took effect on November 1, 2009 (74 FR 42580; September 24, 2009). The commercial tilefish fisheries (ITQ and incidental) are managed using catch and landings limits, commercial quotas, trip limits, gear regulations, permit requirements, and other provisions as prescribed by the FMP. While there is no direct recreational allocation, Amendment 1 implemented a recreational possession limit of eight tilefish per angler per trip, with no minimum fish length. Tilefish was under a stock rebuilding strategy beginning in 2001 until it was declared rebuilt in 2014. The Tilefish FMP, including subsequent Amendments and Frameworks, are available on the Council website at: http://www.mafmc.org/fisheries/fmp/tilefish.

Basic Biology

The information presented in this section can also be found in the Tilefish FMP (MAFMC, 2001; http://www.mafmc.org/fmp/history/tilefish.htm). Golden tilefish (*Lopholatilus chamaeleonticeps*) are found along the outer continental shelf and slope from Nova Scotia, Canada to Surinam on the northern coast of South America (Dooley 1978 and Markle et al. 1980) in depths of 250 to 1500 feet. In the southern New England/mid-Atlantic area, tilefish generally occur at depths of 250 to 1200 feet and at temperatures from 48°F to 62°F or 8.9°C to 16.7°C (Nelson and Carpenter 1968; Low et al. 1983; Grimes et al. 1986).

Katz et al. (1983) studied stock structure of tilefish from off the Yucatan Peninsula in Mexico to the southern New England region using both biochemical and morphological information. They identified two stocks -- one in the mid-Atlantic/southern New England and the other in the Gulf of Mexico and the south of Cape Hatteras.

[1] This document was prepared by the MAFMC staff. Data employed in the preparation of this document are from unpublished National Marine Fisheries Service (NMFS) Dealer, Vessel Trip Reports (VTRs), Permit, and Marine Recreational Statistics (MRFSS/MRIP) databases as of February 2014, unless otherwise noted.
Note: A few editorial modifications were made to the original AP information document which are reflected here. More specifically, the following changes were made on this version of the document: 1) The size category column was updated on Table 4, Percent Standard Error (PSE) values were added to Table 10, and additional text was added to the first paragraph on page 15.

Tilefish are shelter seeking and perhaps habitat limited. There are indications that at least some of the population is relatively nonmigratory (Turner 1986). Warme et al. (1977) first reported that tilefish occupied excavations in submarine canyon walls along with a variety of other fishes and invertebrates, and they referred to these areas as "pueblo villages." Valentine et al. (1980) described tilefish use of scour depressions around boulders for shelter. Able et al. (1982) observed tilefish use of vertical burrows in Pleistocene clay substrates in the Hudson Canyon area, and Grimes et al. (1986) found vertical burrows to be the predominant type of shelter used by tilefish in the mid-Atlantic/southern New England region. Able et al. (1982) suggested that sediment type might control the distribution and abundance of the species, and the longline fishery for tilefish in the Hudson Canyon area is primarily restricted to areas with Pleistocene clay substrate (Turner 1986).

Males achieved larger sizes than females, but they apparently did not live as long (Turner 1986). The largest male was 44.1 inches at 20 years old, and the largest female was 39 years at 40.2 inches FL. The oldest fish was a 46 year old female of 33.5 inches, while the oldest male was 41.3 inches and 29 years. On average, tilefish (sexes combined) grow about 3.5 to 4 inches fork length (FL) per year for the first four years, and thereafter growth slows, especially for females. After age 3, mean last back-calculated lengths of males were larger than those of females. At age 4 males and females averaged 19.3 and 18.9 inches FL, respectively, and by the tenth year males averaged 32.3 while females averaged 26.4 inches FL (Turner 1986).

The size of sexual maturity of tilefish collected off New Jersey in 1971-73 was 24-26 inches TL in females and 26-28 inches TL in males (Morse 1981). Idelberger (1985) reported that 50% of females were mature at about 20 inches FL, a finding consistent with studies of the South Atlantic stock, where some males delayed participating in spawning for 2-3 years when they were 4-6 inches larger (Erickson and Grossman 1986). Grimes et al. (1988) reported that in the late 1970s and early 1980s, both sexes were sexually mature at about 19-26 inches FL and 5-7 years of age; the mean size at 50% maturity varied with the method used and between sexes. Grimes et al. (1986) estimated that 50% of the females were mature at about 19 inches FL using a visual method and about 23 inches FL using a histological method. For males, the visual method estimated 50% maturity at 24 inches FL while the histological method estimated 50% maturity at 21 inches FL. The visual method is consistent with NEFSC estimates for other species (O'Brien et al. 1993). Grimes *et al.* (1988) reported that the mean size and age of maturity in males (but not females) was reduced after 4-5 years of heavy fishing effort. Vidal (2009) conducted an aging study to evaluate changes in growth curves since 1982, the last time the reproductive biology was evaluated by Grimes et al (1988). Histological results from Vidal's study indicate that size at 50% maturity was 18 inches for females and 19 inches for males (NEFSC 2009a).

> "*These results show a significant decrease in size and age at maturation since the last evaluation of this stock in the early 1980's (Grimes et al. 1986). An environment in which survival rates are low for potentially reproducing individuals, often favors selection of individuals that are able to reproduce at smaller sizes and younger ages (Hutchings 1993; Reznick et al. 1990). In a hook fishery, it is assumed*

> *that the smallest fish in the population are less vulnerable to the gear depending on the hook size. In this fishery, hook size has been intentionally increased to avoid catch of the smallest fish in the population. The fact that such dramatic changes have manifested in this stock may suggest a density-dependent effect of decreased population size. It is uncertain at this point in time, whether these changes are consequences of phenotypic plasticity or selection towards genotypes with lower size and age at maturation.*"

Nothing is known about the diets and feeding habits of tilefish larvae, but they probably prey on zooplankton. The examination of stomach and intestinal contents by various investigators reveal that tilefish feed on a great variety of food items (Collins 1884, Linton 1901a and 1901b, and Bigelow and Schroeder 1953). Among those items identified by Linton (1901a and 1901b) were several species of crabs, mollusks, annelid worms, polychaetes, sea cucumbers, anemones, tunicates and fish bones. Bigelow and Schroeder (1953) identified shrimp, sea urchins and several species of fishes in tilefish stomachs. Freeman and Turner (1977) reported examining nearly 150 tilefish ranging in length from 11.5 to 41.5 inches. Crustaceans were the principal food items of tilefish with the squat lobster (*Munida*) and spider crabs (*Euprognatha*) were by far the most important crustaceans. The authors report that crustaceans were the most important food item regardless of the size of tilefish, but that small tilefish fed more on mollusks and echinoderms than larger tilefish. Tilefish burrows provide habitat for numerous other species of fish and invertebrates (Able et al. 1982 and Grimes et al. 1986) and in this respect they are similar to "pueblo villages" (Warme et al. 1977).

Able et al. (1982) and Grimes et al. (1986) concluded that a primary function of tilefish burrows was predator avoidance. The NEFSC database only notes goosefish as a predator. While tilefish are sometimes preyed upon by spiny dogfish and conger eels, by far the most important predator of tilefish is other tilefish (Freeman and Turner 1977). It is also probable that large bottom-dwelling sharks of the genus *Carcharhinus*, especially the dusky and sandbar, prey upon free swimming tilefish.

Status of the Stock

The tilefish stock assessment was peer reviewed and approved for use by management at Stock Assessment Workshop 58 (SAW 58). A statistical catch at age model called ASAP (Age Structured Assessment Program) was used in this assessment to incorporate newly available length and age data to better characterize the population dynamics of the stock. The tilefish resource is not overfished and overfishing is not occurring in 2012. SSB was estimated be 11.53 million lb (5,229 mt) in 2012, about 101% of the biomass target SSBMSY proxy = $SSB_{25\%}$ = 11.36 million lb (5,153 mt). The fishing mortality rate was estimated to be 0.275 in 2012, below the fishing mortality threshold FMSY proxy = $F_{25\%}$ = 0.370. The tilefish stock was previously under a rebuilding plan, but was declared rebuilt by NMFS in 2014 based on SAW 58. The assessment summary report and the entire assessment report can be found at http://nefsc.noaa.gov/publications/crd/crd1403/
and http://nefsc.noaa.gov/publications/crd/crd1404/, respectively.

Fishery Performance

For the 1970 to 2014 calendar years, golden tilefish landings have ranged from 128 thousand lb (1970) to 8.7 million lb (1979). Since 2001, golden tilefish landings have ranged from 1.5 (2005) to 2.5 (2004) million lb (Figure 3).

The principal measure used to manage golden tilefish is monitoring via dealer weighout data that is submitted weekly. Commercial vessels fishing under a tilefish IFQ Allocation Permit must submit a tilefish catch report by using the interactive voice response (IVR) phone line system within 48 hours after returning to port and offloading.

The directed fishery is managed via an IFQ program. If a permanent IFQ allocation is exceeded, including any overage that results from tilefish landed by a lessee in excess of the lease amount, the permanent allocation will be reduced by the amount of the overage in the subsequent fishing year. If a permanent IFQ allocation overage is not deducted from the appropriate allocation before the IFQ allocation permit is issued for the subsequent fishing year, a revised IFQ allocation permit reflecting the deduction of the overage will be issued. If the allocation cannot be reduced in the subsequent fishing year because the full allocation had already been landed or transferred, the IFQ allocation permit would indicate a reduced allocation for the amount of the overage in the next fishing year.

A vessel that holds a Commercial/Incidental Permit can possess up to 500 lb live weight (455 lb gutted) at one time without an IFQ Allocation Permit. If the incidental harvest exceeds 5 percent of the TAL for a given fishing year, the incidental trip limit of 500 lb may be reduced in the following fishing year.

Table 1 summarizes the tilefish management measures for the 2002-2017 fishing years (FYs). With the exception of FY 2003, 2004, and 2010 commercial tilefish landings have been below the commercial quota specified each year since the Tilefish FMP was first implemented. As a result of the decision of the Hadaja v. Evans lawsuit, the permitting and reporting requirements for the FMP were postponed for close to a year (May 15, 2003 through May 31, 2004). During that time period, it was not mandatory for permitted tilefish vessels to report their landings. In addition, during that time period, vessels that were not part of the tilefish limited entry program also landed tilefish.

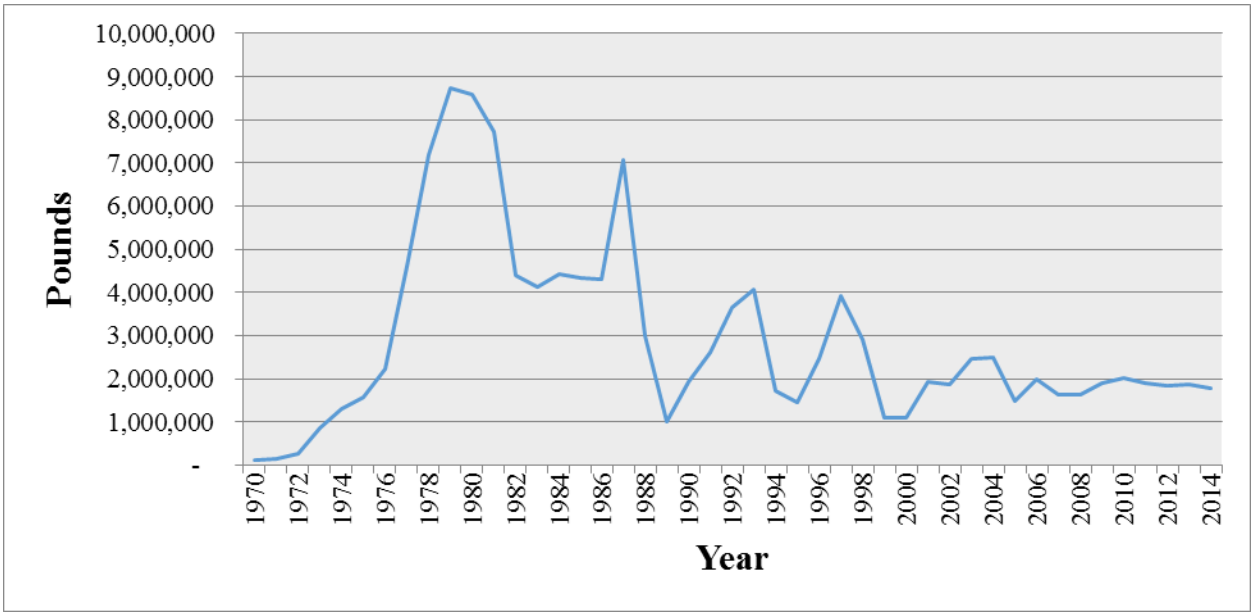

Figure 3. Commercial U.S. Golden Tilefish Landings (live weight) from Maine-Virginia, 1970-2014. Source: 1970-1993 Tilefish FMP. 1994-2014 NMFS unpublished dealer data.

Tilefish are primarily caught by longline and bottom otter trawl. Based on dealer data from 2010 through 2014, the bulk of the tilefish landings are taken by longline gear (98%) followed by bottom trawl gear (<2%). No other gear had any significant commercial landings. Minimal catches were also recorded for hand line, dredge (other), and gillnets (Table 2).

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Table 1. Summary of management measures and landings for FY[a] 2002 through 2017.

Management measures	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
ABC (m lb)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.013	2.013	1.766	1.898	1.898
TAL (m lb)	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.755	1.887	1.887
Com. quota-initial (m lb)	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.755	1.887	1.887
Com. quota-adjusted (m lb)	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.755	1.887	1.887
Com. landings	1.936	2.318[b]	2.606[b]	1.497	1.897	1.775	1.672	1.887	2.002	1.947	1.873	1.817	1.847	-	-	-
Com. overage/underage (m lb)	-0.059	+0.323	+0.611	-0.498	-0.098	-0.220	-0.323	-0.108	+0.007	-0.045	-0.122-	-0.178	-0.148	-	-	-
Incidental trip limit (lb)	300	300	300	133	300	300	300	300	300	300	500	500	500	500	500	500
Rec. possession limit	-	-	-	-	-	-	-	-	8[c]	8[c]	8[c]	8[c]	8[c]	8[c]	8[c]	8[c]

[a] FY 2002 (November 1, 2001 - October 31, 2002).
[b] Lawsuit period (see text above).
[c] Eight fish per person per trip.

Table 2. Tilefish commercial landings ('000 lb live weight) by gear, Maine through Virginia, 2010-2014 combined.

Gear	lb	Percent
Otter Trawl Bottom, Fish	140	1.5
Otter Trawl Bottom, Scallop	1	*
Otter Trawl Bottom, Other	4	*
Otter Trawl, Midwater	2	*
Gillnet, Anchored/Sink/Other	9	*
Lines Hand	18	*
Lines Long Set with Hooks	9,195	97.7
Dredge, Other	3	*
Unknown, Other Combined Gears	37	*
All Gear	9,409	100

Note: * = less than 1,000 lb or less than 1 percent.

Over 48 percent of the landings for 2014 were caught in statistical area 537, which includes Atlantis and Block Canyons; statistical area 616 had 44 percent of the landings, which includes Hudson Canyon; and statistical area 622 had 3 percent of the landings (Table 3). Less than 1 percent of the total landings were caught in statistical areas 525 (includes Oceanographer, Lydonia, and Gilbert Canyons) and 526 (includes Hydrographer and Veatch Canyons). NMFS statistical areas are shown in Figure 4.

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Table 3. Tilefish percent landings by statistical area and year, 1996-2014.

Year	Unk	513	525	526	533	536	537	539	612	613	614	615	616	622	626	Other
1996	19.76	0.14	0.07	5.15	0.61	-	43.76	0.38	*	1.06	-	-	27.82	0.01	-	1.24
1997	23.29	0.39	0.03	0.67	0.01	-	56.21	0.02	*	2.59	-	*	16.40	0.01	*	0.37
1998	16.21	*	1.24	2.15	0.04	-	65.84	0.04	-	5.44	-	0.03	8.53	*	*	0.46
1999	2.57	*	0.97	0.22	0.01	-	55.07	0.01	0.11	3.68	-	0.16	36.78	0.02	0.02	0.38
2000	*	-	0.36	3.76	0.99	-	45.64	0.01	0.05	2.35	-	1.26	43.49	0.47	0.14	1.49
2001	-	0.03	0.23	3.09	0.01	-	23.91	*	0.01	3.16	-	0.02	68.96	*	0.10	0.46
2002	-	-	0.12	8.73	-	-	35.86	0.07	0.01	15.39	-	*	39.64	0.02	0.02	0.13
2003	-	-	0.88	1.79	0.08	-	38.45	0.10	-	11.84	0.01	*	46.47	0.05	0.05	0.28
2004	-	*	1.02	2.59	0.01	-	61.66	0.06	5.28	0.70	-	0.02	25.91	0.03	0.06	2.64
2005	-	-	0.12	0.24	1.98	-	61.74	0.02	0.03	5.99	-	1.81	25.17	0.03	0.20	2.66
2006	-	-	*	1.54	*	1.96	61.69	0.50	1.24	0.71	-	0.07	30.09	0.04	0.05	2.09
2007	-	-	0.02	0.40	*	4.56	52.45	0.01	-	5.26	4.95	0.38	30.00	0.81	0.41	0.78
2008	-	-	1.02	0.05	*	7.61	36.83	-	-	4.30	6.92	0.94	40.27	1.91	0.02	0.13
2009	-	-	2.06	0.01	-	3.97	40.53	1.23	0.04	4.15	4.90	0.01	39.67	1.27	1.11	1.04
2010	-	-	0.01	0.01	0.01	-	57.13	0.55	0.02	7.28	*	0.05	33.94	0.69	0.04	0.26
2011	-	2.86	0.02	*	-	-	53.06	0.01	-	3.12	-	0.37	39.98	0.31	0.06	0.21
2012	-	-	0.01	0.01	-	-	52.54	0.03	*	0.58	-	2.58	43.92	0.20	0.10	0.03
2013	-	-	*	0.67	-	-	56.23	1.06	0.03	0.69	-	0.01	35.39	1.21	4.59	0.13
2014		-	0.01	0.43	*		48.55	1.92	0.01	1.31	-	0.34	43.62	2.72	0.36	0.74
All	4.57	0.19	0.44	1.65	0.16	0.82	51.03	0.31	0.51	4.05	0.75	0.35	33.48	0.46	0.37	0.84

Note: - = no landings; * = less than 0.01 percent.

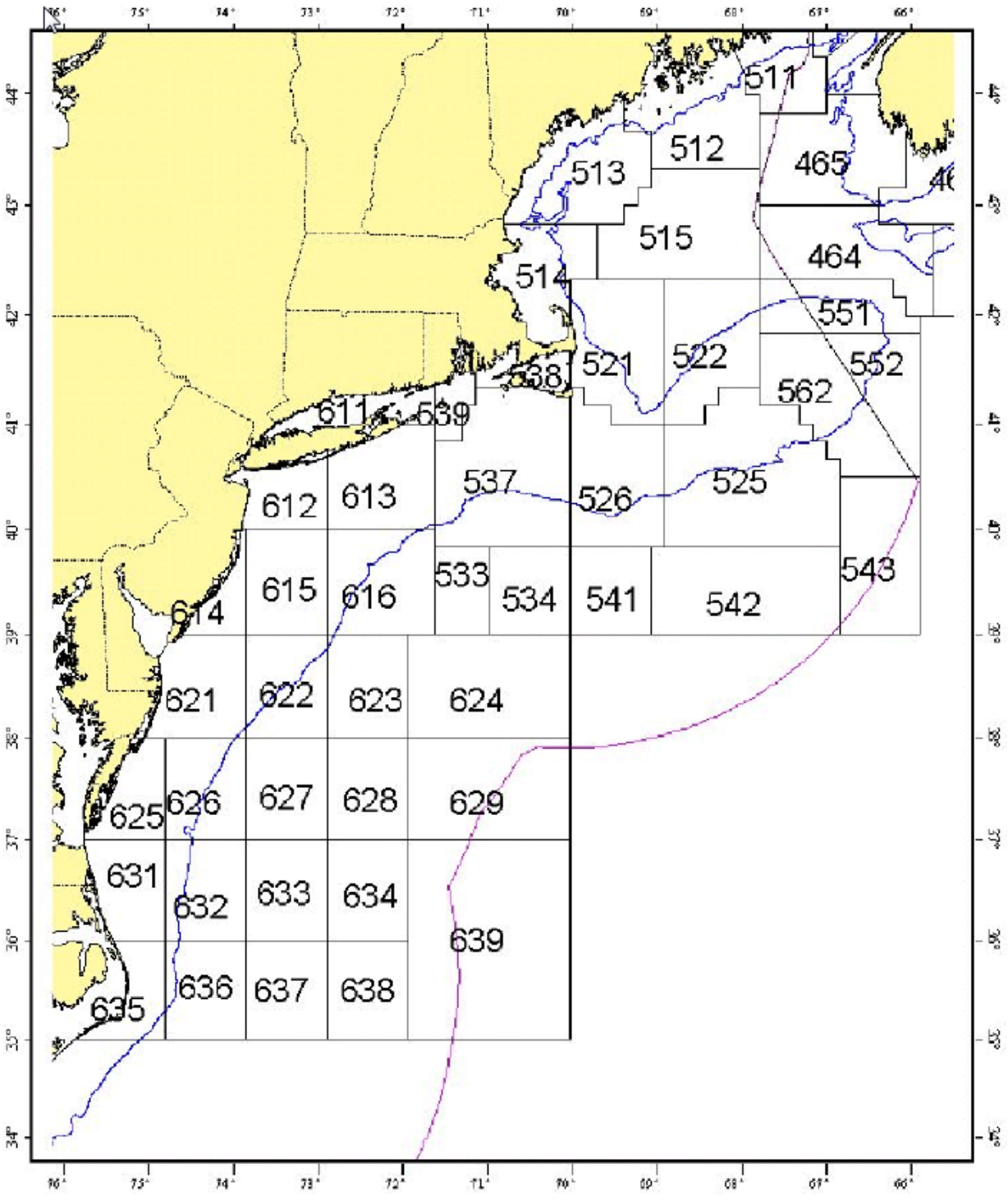

Figure 4. NMFS Statistical Areas.

Commercial tilefish ex-vessel revenues have ranged from $2.5 to $5.9 million for the 1999 through 2014 period. The mean price for tilefish (adjusted) has ranged from $1.03/lb in 2004 to $3.44/lb in 2014 (Figure 5).

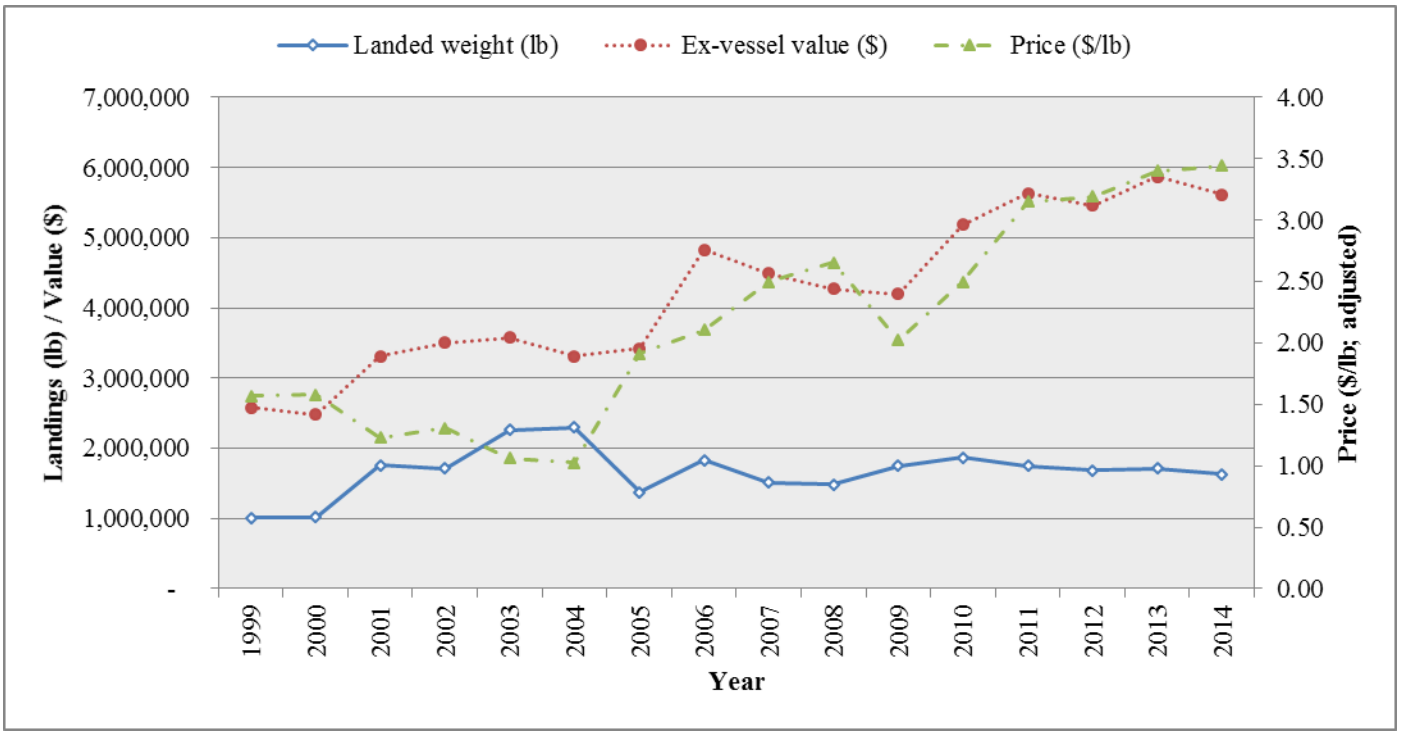

Figure 5. Landings, ex-vessel value, and price for tilefish, Maine through Virginia combined, 1999-2014. Note: Prices were adjusted to 2014 values using the Bureau of Labor Statistics Producer Price Index.

The 2009 through 2013 coastwide average ex-vessel price per pound for all market categories combined was $3.21. Price differential indicates that larger fish tend to bring higher prices (Table 4). Nevertheless, even though there is a price differential for various sizes of tilefish landed, tilefish fishermen land all fish caught as the survival rate of discarded fish is very low (L. Nolan 2006; Kitts et al. 2007). Furthermore, Amendment 1 to the Tilefish FMP prohibited the practice of highgrading (MAFMC 2009).

Table 4. Landings, ex-vessel value, and price of tilefish by size category, from Maine thought Virginia, 2010 through 2014.

Size Category	Landed Weight ('000 lb)	Value ($1,000)	Price ($/lb)
Extra large	227,897	886,707	3.89
Large	2,402,534	9,381,398	3.90
Large/Medium	206,756	789,200	3.82
Medium	3,032,231	9,133794	3.01
Small or Kittens	1,762,485	4,378,739	2.48
Extra small	126,203	277,045	2.20
Unclassified	880,703	2,915,517	3.31
All	8,638,809	27,762,400	3.21

The ports and communities that are dependent on tilefish are fully described in Amendment 1 to the FMP (section 6.5; MAFMC 2009; found at http://www.mafmc.org/fmp/pdf/Tilefish_Amend_1_Vol_1.pdf). Additional information on "Community Profiles for the Northeast US Fisheries" can be found at http://www.nefsc.noaa.gov/read/socialsci/community_profiles/.

To examine recent landings patterns among ports, 2013-2014 NMFS dealer data are used. The top commercial landings ports for tilefish are shown in Table 5. A “top port” is defined as any port that landed at least 10,000 lb of golden tilefish. Ports that received 1% or greater of their total revenue from tilefish are shown in Table 6.

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Table 5. Top ports of landing (in lb) for golden tilefish, based on NMFS 2013 - 2014 dealer data. Since this table includes only the "top ports," it may not include all of the landings for the year. (Note: values in parenthesis correspond to IFQ vessels).

Port	2013		2014	
	Landings (lb)	# Vessels	Landings (lb)	# Vessels
Montauk, NY	1,196,116 (1,192,000)	14 (4)	1,181,053 (1,177,288)	14 (4)
Barnegat Light/Long Beach, NJ	357,360 (355,845)	8 (6)	376,226 (372,013)	12 (8)
Hampton Bays, NY	267,221 (C)	4 (1)	168,770 (C)	4 (1)
Point Judith, RI	23,962 (C)	53 (1)	14,277 (0)	45 (0)
Shinnecock, NY	0 (0)	0 (0)	(C) (C)	2 (1)

Note: C = Confidential.

Table 6. Ports that generated 1% or greater of total revenues from golden tilefish, 2010-2014.

Port	State
Montauk	New York
Hampton Bays	New York
Barnegat Light/Long Beach	New Jersey
Shinnecock	New York
Other Monmouth	New Jersey

In 2014 there were 64 Federally permitted dealers who bought golden tilefish from 143 vessels that landed this species from Maine through Virginia. In addition, 64 dealers bought tilefish from 112 vessels in 2013. These dealers bought approximately $5.6 and $5.9 of tilefish in 2014 and 2013, respectively, and are distributed by state as indicated in Table 7. Table 8 shows relative dealer dependence on tilefish.

Table 7. Dealers reporting buying golden tilefish, by state in 2013 - 2014.

# of Dealers	MA		RI		CT		NY		NJ		MD		VA		Other	
	'13	'14	'13	'14	'13	'14	'13	'14	'13	'14	'13	'14	'13	'14	'13	'14
	9	8	10	9	8	10	17	20	10	9	C	3	7	4	1	1

Note: C = Confidential.

Table 8. Dealer dependence on tilefish, 2010-2014.

Number of Dealers	Relative Dependence on Tilefish
84	<5%
5	5%-10%
4	10% - 25%
1	25% - 50%
1	50% - 75%
1	90%+

According to VTR data, very little (< 0.3%) discarding was reported by longline vessels that targeted tilefish for the 2005 through 2014 period (Table 9). In addition, the 2014 tilefish stock assessment indicates that tilefish discards in the trawl and longline fishery are negligible (NEFSC 2014).

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Table 9. Catch disposition for directed tilefish trips[a], Maine through Virginia, 2005-2014 combined.

Common Name	Kept lb	% species	% total	Discarded lb	% species	% total	Total lb	Disc: Kept Ratio
GOLDEN TILEFISH	15,549,080	100.00%	99.08%	0	0.00%	0.00%	15,549,080	0.00
SPINY DOGFISH	94,828	85.55%	0.60%	16,018	14.45%	37.63%	110,846	0.17
BLUELINE TILEFISH	15,388	100.00%	0.10%	0	0.00%	0.00%	15,388	0.00
CONGER EEL	9,013	93.87%	0.06%	589	6.13%	1.38%	9,602	0.07
BLACK BELLIED ROSEFISH	4,269	100.00%	0.03%	0	0.00%	0.00%	4,269	0.00
SKATES OTHER	3,201	67.66%	0.02%	1,530	32.34%	3.59%	4,731	0.48
SNOWY GROUPER	3,100	100.00%	0.02%	0	0.00%	0.00%	3,100	0.00
TILEFISH OTHER	2,692	100.00%	0.02%	0	0.00%	0.00%	2,692	0.00
DOGFISH SMOOTH	2,634	76.26%	0.02%	820	23.74%	1.93%	3,454	0.31
EEL OTHER	1,809	100.00%	0.01%	0	0.00%	0.00%	1,809	0.00
WRECKFISH	1,240	100.00%	0.01%	0	0.00%	0.00%	1,240	0.00
BLUEFISH	898	22.63%	0.01%	3,070	77.37%	7.21%	3,968	3.42
MONKFISH	742	100.00%	0.00%	0	0.00%	0.00%	742	0.00
YELLOWFIN TUNA	680	100.00%	0.00%	0	0.00%	0.00%	680	0.00
DOLPHIN FISH	627	100.00%	0.00%	0	0.00%	0.00%	627	0.00
BLACK SEA BASS	563	100.00%	0.00%	0	0.00%	0.00%	563	0.00
MAKO SHORTFIN SHARK	524	100.00%	0.00%	0	0.00%	0.00%	524	0.00
BLUEFIN TUNA	440	91.67%	0.00%	40	8.33%	0.09%	480	0.09
RED HAKE	438	79.20%	0.00%	115	20.80%	0.27%	553	0.26
SILVER HAKE (WHITING)	300	93.75%	0.00%	20	6.25%	0.05%	320	0.07
MAKO SHARK OTHER	284	89.03%	0.00%	35	10.97%	0.08%	319	0.12
FISH OTHER	218	100.00%	0.00%	0	0.00%	0.00%	218	0.00
AMERICAN EEL	150	100.00%	0.00%	0	0.00%	0.00%	150	0.00
REDFISH	147	100.00%	0.00%	0	0.00%	0.00%	147	0.00
MIX RED & WHITE HAKE	125	100.00%	0.00%	0	0.00%	0.00%	125	0.00
CUSK	97	100.00%	0.00%	0	0.00%	0.00%	97	0.00
ALBACORE TUNA	75	100.00%	0.00%	0	0.00%	0.00%	75	0.00
PORBEAGLE SHARK	75	100.00%	0.00%	0	0.00%	0.00%	75	0.00
WHITE HAKE	74	100.00%	0.00%	0	0.00%	0.00%	74	0.00

Table 9 (continued). Catch disposition for directed tilefish trips[a], Maine through Virginia, 2005-2014 combined.

Common Name	Kept lb	% species	% total	Discarded lb	% species	% total	Total lb	Disc: Kept Ratio
SUMMER FLOUNDER	72	100.00%	0.00%	0	0.00%	0.00%	72	0.00
BLACK WHITING	24	100.00%	0.00%	0	0.00%	0.00%	24	0.00
AMBER JACK	18	100.00%	0.00%	0	0.00%	0.00%	18	0.00
POLLOCK	17	100.00%	0.00%	0	0.00%	0.00%	17	0.00
TIGER SHARK	0	0.00%	0.00%	10,400	100.00%	24.43%	10,400	--
SKATE BARDOOR	0	0.00%	0.00%	3,881	100.00%	9.12%	3,881	--
DOGFISH CHAIN	0	0.00%	0.00%	2,722	100.00%	6.39%	2,722	--
JONAH CRAB	0	0.00%	0.00%	1,273	100.00%	2.99%	1,273	--
LOBSTER	0	0.00%	0.00%	775	100.00%	1.82%	775	--
BLUE SHARK	0	0.00%	0.00%	725	100.00%	1.70%	725	--
SKATE ROSETTE	0	0.00%	0.00%	398	100.00%	0.93%	398	--
HAMMERHEAD SHARK	0	0.00%	0.00%	100	100.00%	0.23%	100	--
SHARK OTHER	0	0.00%	0.00%	60	100.00%	0.14%	60	--
ALL SPECIES	15,693,842	99.73%	100.00%	42,571	0.27%	100.00%	15,736,413	0.00

[a] Directed trips for tilefish were defined as trips comprising 75 percent or more by weight of tilefish landed. Number of trips = 1,161.

Recreational Fishery

A small recreational fishery briefly occurred during the mid 1970's, with less than 100,000 lb annually (MAFMC 2000). Subsequent recreational catches have been low for the 1982 - 2012 period, ranging from zero for most years to approximately 30,000 fish in 2010 according to NMFS recreational statistics (Table 10). In 2013, approximately 262,000 fish were caught. The tilefish catch in the MRIP survey is likely below detection levels of the survey judging from the sporadic estimates in the survey.

VTR data indicates that the number of tilefish caught by party/charter vessels from Maine through Virginia is low, ranging from 81 fish in 1996 to 6,856 fish in 2014 (Table 11). Mean party/charter effort ranged from less than one fish per angler in 1999 throughout 2002 and 2005 to approximately eight fish per angler in 1998, averaging 2.2 fish for the entire time series.

According to VTR data, for the 1996 through 2013 period, the largest amount of tilefish caught by party/charter vessels were made by New Jersey vessels (22,294), followed by New York (8,729), Virginia (527), Massachusetts (496), Delaware (420), Maryland (282), Rhode Island (182), and Connecticut (3). Party/charter boats from New Jersey have shown a significant

uptrend in the number of tilefish caught during the time series while the boats from Rhode Island have shown a significant downward trend in the number of fish caught (Table 12).

The number of tilefish discarded by recreational anglers is low. According to VTR data, on average, approximately 2.6 fish per year were discarded by party/charter recreational anglers for the 1996 through 2014 period. The quantity of tilefish discarded by party/charter recreational anglers ranged from zero in most years to 13 in 2010.

Recreational anglers typically fish for tilefish when tuna fishing especially during the summer months (Freeman, pers. comm. 2006). However, some for hire vessels from New Jersey and New York are tilefish fishing in the winter months (Caputi pers. comm. 2006). In addition, recreational boats in Virginia are also reported to be fishing for tilefish (Pride pers. comm. 2006). However, it is not known with certainty how many boats may be targeting tilefish. Nevertheless, accounting for information presented in the Fishery Performance Reports (2012-2014) and a brief internet search conducted by Council Staff in 2014 indicates that there have been approximately 10 headboats actively engaged in the tilefish fishery in the Mid-Atlantic canyons in recent years. It is estimated that approximately 4 of these boats conducted direct tilefish fishing trips, while the other 6 boats may have caught tilefish while targeting tuna/swordfish or fishing for assorted deep water species. In addition, it appears that recreational interest onboard headboats for tilefish has increase in the last few years as seen in the FPRs, internet search conducted by Council staff, and recent VTR recreational party/charter statistics (MAFMC 2014).

Anglers are highly unlikely to catch tilefish while targeting tuna on tuna fishing trips. However, these boats may fish for tilefish at any time during a tuna trip (i.e., when the tuna limit has been reached, on the way out or on the way in from a tuna fishing trip, or at any time when tuna fishing is slow). While fishing for tuna recreational anglers may trawl using rod and reel (including downriggers), handline, and bandit gear. Rod and reel is the typical gear used in the recreational tilefish fishery. Because tilefish are found in relatively deep waters, electric reels may be used to facilitate landing (Freeman and Turner 1977).

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Table 10. Recreational tilefish data from the NMFS recreational statistics databases, 1982-2013.

Year	no. of fish measured	Landed no. party/charter		A and B1 private		Released no. B2 private	
1982	0	0		984	(72.4)	0	
1983	0	0		0		0	
1984	0	0		0		0	
1985	0	0		0		0	
1986	0	0		0		0	
1987	0	0		0		0	
1988	0	0		0		0	
1989	0	0		0		0	
1990	0	0		0		0	
1991	0	0		0		0	
1992	0	0		0		0	
1993	0	0		0		0	
1994	0	608	(100.0)	0		0	
1995	0	0		0		0	
1996	0	6,842	(50.9)	0		0	
1997	0	0		0		0	
1998	0	0		0		0	
1999	0	0		0		0	
2000	0	0		0		0	
2001	0	148	(100.0)	0		0	
2002	0	0		20,068	(59.4)	1,338	(100.0)
2003	18	722	(69.1)	0		0	
2004	3	62	(99.3)	0		0	
2005	0	0		0		0	
2006	0	541	(100.4)	0		0	
2007	2	1,330	(78.3)	0		0	
2008	0	0		0		0	
2009	0	177	(87.8)	0		0	
2010	3	2,812	(90.5)	27,514	(77.2)	0	
2011	0	0		0		0	
2012	0	0		0		0	
2013	0	262,216	(13.9)	0		0	

Source: NOAA, https://www.st.nmfs.noaa.gov/.

Table 11. Number of tilefish kept by party/charter anglers and mean effort from Maine through Virginia, 1996 through 2014.

Year	Number of tilefish kept	Mean effort
1996	81	1.4
1997	400	7.5
1998	243	8.1
1999	91	0.4
2000	147	0.5
2001	172	0.7
2002	774	0.9
2003	991	1.6
2004	737	1.2
2005	498	0.9
2006	477	1.2
2007	1,077	1.2
2008	1,100	1.3
2009	1,451	1.3
2010	1,866	2.0
2011	2,938	3.4
2012	6,424	2.8
2013	6,560	3.2
2014	6,856	3.2
All	32,893	2.2

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Table 12. Number of tilefish caught by party/charter vessels by state, 1996 through 2014.

Year	MA	RI	CT	NY	NJ	DE	MD	VA	All
1996	0	0	0	81	0	0	0	0	81
1997	0	0	0	400	0	0	0	0	400
1998	0	102	0	141	0	0	0	0	243
1999	0	1	0	88	0	0	2	0	91
2000	0	0	0	108	39	0	0	0	147
2001	0	0	0	122	51	0	0	0	173
2002	0	0	0	401	373	0	0	0	774
2003	0	3	0	86	902	0	0	0	991
2004	0	0	0	12	628	0	0	104	744
2005	0	72	0	82	318	14	0	16	502
2006	0	0	0	265	65	2	133	12	477
2007	0	0	0	447	459	88	5	80	1,079
2008	0	3	0	488	545	22	32	10	1,100
2009	0	0	0	720	675	18	7	31	1,451
2010	0	0	0	595	1,194	19	23	48	1,879
2011	496	0	0	720	1,654	60	5	14	2,949
2012	0	1	0	1,116	5,146	42	23	98	6,426
2013	0	0	0	1,900	4,568	39	12	41	6,560
2014	0	0	3	957	5,677	116	40	73	6,866
All	496	182	3	8,729	22,294	420	282	527	32,933

References

Caputi, G. 2006. Personal communication. Ex-member of the MAFMC, recreational angler, and offshore editor for the saltwater sportsman magazine. Brick, NJ.

Kitts, A., P. Pinto da Silva, and B. Rountree. 2007. The evolution of collaborative management in the Northeast USA tilefish fishery. Marine Policy 31(2), 192-200.

Mid-Atlantic Fishery Management Council. 2001. Tilefish Fishery Management Plan. Dover, DE. 443 pp. + appends.

Mid-Atlantic Fishery Management Council. 2009. Amendment 1 to the Tilefish Fishery Management Plan. Dover, DE. Volume 1, 496 pp.

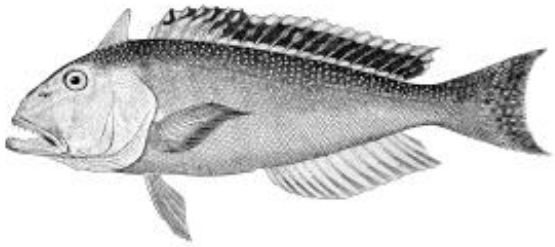
Mid-Atlantic Fishery Management Council. 2014. Tilefish white paper. Dover, DE. 33 pp.

Nolan, L. 2006. Personal communication. Member of the MAFMC and tilefish commercial fisher. Montauk, NY.

Northeast Fisheries Science Center. 2014. 58th Northeast Regional Stock Assessment Workshop (58th SAW) Assessment Summary Report. U.S. Dept Commer, Northeast Fish Sci Cent Ref Doc. 14-03; 44 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://nefsc.noaa.gov/publications/.

Pride, B. 2006. Personal communication. Ex-member of the MAFMC. Newport News, VA.

Golden Tilefish, *Lopholatilus chamaeleonticeps*, data update through 2014 in the Middle Atlantic-Southern New England Region



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Introduction

Golden tilefish, *Lopholatilus chamaeleonticeps*, inhabit the outer continental shelf from Nova Scotia to South America, and are relatively abundant in the Southern New England to Mid-Atlantic region at depths of 80 to 440 m. Tilefish have a narrow temperature preference of 9 to 14 C. Their temperature preference limits their range to a narrow band along the upper slope of the continental shelf where temperatures vary by only a few degrees over the year. They are generally found in and around submarine canyons where they occupy burrows in the sedimentary substrate. Tilefish are relatively slow growing and long-lived, with a maximum observed age of 46 years and a maximum length of 110 cm for females and 39 years and 112 cm for males (Turner 1986). At lengths exceeding 70 cm, the predorsal adipose flap, characteristic of this species, is larger in males and can be used to distinguish the sexes. Tilefish of both sexes are mature at ages between 5 and 7 years (Grimes et. al. 1988).

Golden Tilefish was first assessed at SARC 16 in 1992 (NEFSC 1993). The Stock Assessment Review Committee (SARC) accepted a non-equilibrium surplus production model (ASPIC). The ASPIC model estimated biomass-based fishing mortality (F) in 1992 to be 3-times higher than F_{MSY}, and the 1992 total stock biomass to be about 40% of B_{MSY}. The intrinsic rate of increase (r) was estimated at 0.22.

The Science and Statistical Committee reviewed an updated tilefish assessment in 1999. Total biomass in 1998 was estimated to be 2,936 mt, which was 35% of B_{MSY} = 8,448 mt. Fishing mortality was estimated to be 0.45 in 1998, which was about 2-times higher than F_{MSY} = 0.22. The intrinsic rate of increase (r) was estimated to be 0.45. These results were used in the development of the Tilefish Fishery Management Plan (Mid-Atlantic Fishery Management Council 2000). The Mid-Atlantic Fishery Management Council implemented the Tilefish Fishery Management Plan (FMP) in November of 2001. Rebuilding of the tilefish stock to B_{MSY} was based on a ten-year constant harvest quota of 905 mt.

SARC 41 reviewed a benchmark tilefish assessment in 2005. The surplus production model indicated that the tilefish stock biomass in 2005 has improved since the assessment in 1999. Total biomass in 2005 is estimated to be 72% of B_{MSY} and fishing mortality in 2004 is estimated to be 87% of F_{MSY}. Biological reference points did not change greatly from the 1999 assessment. B_{MSY} is estimated to be 9,384 mt and F_{MSY} is estimated to be 0.21. The SARC concluded that the projections are too uncertain to form the basis for evaluating likely biomass recovery schedules relative to B_{MSY}. The TAC and reference points were not changed based on the SARC 41 assessment.

Stock status from SARC 48 (2009) was also based on the ASPIC surplus production model which was the basis of the stock assessment for the last three assessments. The model is calibrated with CPUE series, as there are no fishery-independent sources of information on trends in population abundance. While the Working Group expressed concern about the lack of fit of the model to the VTR CPUE index at the end of the time series, they agreed to accept the estimates of current fishing mortality and biomass and associated reference points. The instability of model results in the scenario projections was also a source of concern. It was noted that the

bootstrap uncertainty estimates do not capture the true uncertainty in the assessment. The ASPIC model indicates that the stock is rebuilt. However, the working group acknowledges that there is high uncertainty on whether the stock is truly rebuilt.

The golden tilefish stock was last assessed at SARC 58 in 2014 with a terminal year of 2012 (http://nefsc.noaa.gov/publications/crd/crd1403/partb.pdf, http://nefsc.noaa.gov/publications/crd/crd1404/partb.pdf). The Golden Tilefish stock was not overfished and overfishing was not occurring in 2012 relative to the SARC 58 accepted biological reference points. The stock was declared rebuilt in 2014 by NMFS based of SARC 58 results which indicated that SSB was at 101% of the accepted SSB_{MSY}. A new model, ASAP, was used in this assessment to incorporate newly available length and age data. The ASAP model integrates more realistic life history information on size and growth into a single model framework and better characterizes the population dynamics of the tilefish stock.

In this report, commercial landings, longline fishery CPUE, and landings size distributions were updated with two additional years of data through 2014. Updated data is summarized in Tables 1 to 3 and Figures 1, 2, 4-7, 9-11. Figures 3 and 8 are taken from the last assessment and have not been updated. Updated data through 2014 showed continuation of the declining trend in CPUE while the catch is comprised of a wide size distribution. The decline in CPUE is not surprising judging from the past influence of a strong year class on CPUE. There is also evidence of a new stronger year class recently entering the fishery in 2013 and 2014.

Commercial catch data

Total commercial landings (live weight) increased from less than 125 metric tons (mt) during 1967-1972 to more than 3,900 mt in 1979 and 1980. Annual landings have ranged between 666 and 1,838 mt from 1988 to 1998. Landings from 1999 to 2002 were below 900 mt (ranging from 506 to 874 mt). An annual quota of 905 mt was implemented in November of 2001. Landings in 2003 and 2004 were slightly above the quota at 1,130 mt and 1,215 mt respectively. Landing from 2005 to 2009 have been at or below the quota. Landings in 2010 at 922 mt were slightly above the quota (Table 1, Figure 1). Since 2010 landings have been below the quota. The preliminary landings retrieval for 2014 as of 2/5/15 was 814 mt. During the late 1970s and early 1980s Barnegat, NJ was the principal tilefish port; more recently Montauk, NY has accounted for most of the landings. Most of the commercial landings are taken by the directed longline fishery. Discards in the trawl and longline fishery appear to be a minor component of the catch. Recreational catches have also appeared to be low and were not included as a component of the removals in the assessment model.

Commercial CPUE data

A fishery independent index of abundance does not exist for tilefish. Analyses of catch (landings) and effort data were confined to the longline fishery since directed tilefish effort occurs in this fishery (e.g. the remainder of tilefish landings are taken as bycatch in the trawl fishery). Most longline trips that catch tilefish fall into two categories: (a) trips in which tilefish comprise greater than 90% of the trip catch by weight and (b) trips in which tilefish accounted

for less than 10% of the catch. Effort was considered directed for tilefish when at least 75% of the catch from a trip consisted of tilefish.

Three different series of longline effort data were analyzed. The first series was developed by Turner (1986) who used a general linear modeling approach to standardize tilefish effort during 1973-1982 measured in kg per tub (0.9 km of groundline with a hook every 3.7 m) of longline obtained from logbooks of tilefish fishermen. Two additional CPUE series were calculated from the NEFSC weighout (1979-1993) and the VTR (1995-2014) systems. Effort from the weighout data was derived by port agents' interviews with vessel captains whereas effort from the VTR systems comes directly from mandatory logbook data. In the SARC 48 assessment and in the 1998 and 2005 tilefish assessments, Days Absent was used as the best available effort metric. In the 1998 assessment an effort metric based on Days Fished (average hours fished per set / 24 * x number of sets in trip) was not used because effort data were missing in many of the logbooks and the effort data were collected on a trip basis as opposed to a haul by haul basis. In the SARC 48 assessment effort was calculated as:

Effort = days absent (time & date landed - time & date sailed) - number of trips.

For some trips, the reported days absent were calculated to be a single day. This was considered unlikely, as a directed tilefish trip requires time for a vessel to steam to near the edge of the continental shelf, time for fishing, and return trip time. Thus, to produce a realistic effort metric based on days absent, a one day steam time for each trip (or the number of trips) was subtracted from days absents and therefore only trips with days absent greater than one day were used.

The number of vessels targeting tilefish has declined since the 1980s (Table 2, Figure 2); during 1994-2003 and 2005-2014, five vessels accounted for more than 70 percent of the total tilefish landings. The number of vessels targeting tilefish has remained fairly constant since the assessment in 2005. The length of a targeted tilefish trip had been generally increasing until the mid 1990s. At the time of the 2005 assessment trip lengths have shorten to about 5 days. Trip length has increased slightly until 2008 and has subsequently declined until 2011. Trip lengths have been increasing slightly since 2011 to about 8 days in 2014 (Figure 2). In the weighout data the small number of interviews is a source of concern; very little interview data exists at the beginning of the time series (Table 2, Figure 3). The 5 dominant tilefish vessels make up almost all of the VTR reported landings.

The number of targeted tilefish trips declined in the early 1980s while trip length increased at the time the FMP was being developed in 2000 (Figures 2 and 4). During the 2005 assessment the number of trips became relatively stable as trip length decreased. The interaction between the number of vessels, the length of a trip and the number of trips can be seen in the total days absent trend in Figure 4. Total days absent remained relatively stable in the early 1980s, but then declined at the end of the weighout series (1979-1994). In the beginning of the VTR series (1994-2004) days absent increased through 1998 but declined to 2005. Days absent increased from 2005 to 2008 but subsequential declined until 2011. Since 2011 total days absent has been increasing slightly. When interpreting total days absent trends, it is important to note

with improvements in data collection more recently that the subset of CPUE landings makes up a greater proportion of the total dealer landings (Figure 4).

CPUE trends are very similar for most vessels that targeted tilefish. A sensitivity test of the GLM using different vessel combinations was done in SARC 41. The SARC 41 GLM was found not to be sensitivite to different vessels entering the CPUE series. Very little CPUE data exist for New York vessels in the 1979-1994 weighout series despite the shift in landing from New Jersey to New York before the start of the VTR series in 1994. Splitting the weighout and VTR CPUE series can be justified by the differences in the way effort was measured and difference in the tilefish fleet between the series. In breaking up the series we omitted 1994 because there were very little CPUE data. The sparse 1994 data that existed came mostly from the weighout system in the first quarter of the year. Very similar trends exist in the four years of overlap between Turner (1986) CPUE and the weighout series (Figure 5). At SARC 58 additional logbook data for three New York vessels was collected from New York fishermen from 1991-1994 and added to the VTR series. This was done to provide more information (years of overlap) in the modeling between the Weighout and the VTR series.

Since 1979, the tilefish industry has changed from using cotton twine to steel cables for the backbone and from J hooks to circle hooks. The gear change to steel cable and snaps started on New York vessels in 1983. In light of possible changes in catchability associated with these changes in fishing gear, the working group considered that it would be best to use the three available indices separately rather than combined into one or two series. The earliest series (Turner 1986) covered 1973-1982 when gear construction and configuration was thought to be relatively consistent. The Weighout series (1979-1993) overlapped the earlier series for four years and showed similar patterns and is based primarily on catch rates from New Jersey vessels. The VTR (1991-2014) series is based primarily on information from New York vessels using steel cable and snaps.

The NEFSC Weighout and VTR CPUE series were standardized using a general linear model (GLM) incorporating year and individual vessel effects. The CPUE was standardized to an individual longline vessel and the year 1984; the same year used in the last assessment. For the VTR series the year 2000 was used as the standard. Model coefficients were back-transformed to a linear scale after correcting for transformation bias. The updated GLM model that accounted for individual vessel effects appears to show more of an overall increasing trend in CPUE in comparison to the nominal series (Figure 6).

More recently changes in the CPUE can be generally explained with evidence of strong incoming year classes that track through the landings size composition over time (See below). Since the SARC 48 assessment there appear to be increases in CPUE due to one or two new strong year classes. In general, strong year classes appear to persist longer in the fishery after the FMP and after the constant quota management came into effect which is evident in both the CPUE and size composition data. The continued decrease in the CPUE in 2013 and 2014 is consistent with the ageing of the last strong year class.

Commercial market category and size composition data

Seven market categories exist in the database. From smallest to largest they are: extra small, small, kitten, medium, large/medium, large and extra-large as well as an unclassified category. Differences in the naming convention among ports tend to cause some confusion. For example small and kitten categories reflect similar size fish. Smalls is the naming convention used in New Jersey whereas the kitten market category is used primarily in New York ports. A new code was recently developed for the large/medium category in 2013 and 2014. In 2014 it appears that fish which would have been called unclassified in the past are now correctly coded as large/mediums.

The proportion of landings in the kittens and small market categories increased in 1995 and 1996. Evidence of several strong recruitment events can be seen tracking through the market category proportions (Table 3, Figures 7). The proportion of the large market category has been relatively low in the 1990s until around 2004. The proportion of larges has increased since 2005. The strong year class tracking through the small kitten and mediums in the late 1990s did not materialize into the large market category.

Evidence of two strong recruitment events can be seen tracking through these market categories. At the time of the 2005 tilefish assessment the proportion of large market category had declined since the early 1980s. However more recently a greater proportion of the landings are coming from the large market category as the last strong year class (1999) has grown (Table 3, Figure 7). Commercial length sampling was inadequate over most of the early time series. However some commercial length sampling occurred in the mid to late 1990s. More recently there has been a substantial increase in the commercial length sampling from 2003 to 2014.

Commercial length frequencies were expanded for years where sufficient length data exist (1995-1999 and 2002-2014). The large length frequency samples from 1996 to 1998 were used to calculate the 1995 to 1999 expanded numbers at length while the large length samples from 2001 and 2003 were used to calculate the 2002 expanded numbers at length. No lengths for extra small (xs) exist in 2013. In 2013 kittens lengths were used to characterize the extra small category.

Evidence of strong 1992/1993 and 1998/1999 year classes can be seen in the expanded numbers at length in the years when length data existed (1995-1999, 2002-2008, and 2008-2014) (Figures 8 to 11). The matching of modes in the length frequency with ages was done using Turner's (1986) and Vidal's (2009) growth studies and the 2007-2013 catch at age information. In 2004 and 2005 the 1998/1999 year class can be seen growing into the medium market category and in 2006 and 2007 the year class has entered the large market category (Figure 9). From 2002 to 2007 it appears that most of the landings were comprised of this year class.

A similar pattern occurred with the 2005 year class from 2009-2013. An increase in the landings and CPUE can be seen when the 1992/1993, 1998/1999 and 2005 year classes recruit to the longline fishery. As the year classes gets older the catch rates decline. At this point the catch also gets more widely distributed over multiple year classes. This can be seen in 2007-2008 and

2012-2014 (Figure 9). CPUE appears to decline as the strong year classes get older than about 6 years. In 2013 and 2014 catch appears to be comprised of multiple year classes with a wide distribution of fish sizes being caught as the catch rates have declined in the VTR series (Figure 10).

Concern was expressed at SARC 48 (2009) with little evidence of an incoming year class, catch rates declining and the mismatch between the biomass trends predicted by the surplus production model in comparison to the observed CPUE at the end of the time series. However, since the 2009 assessment there is evidence of a strong year class (2005) tracking through the landings size distributions. In 2012 that year class has entered the large market category and as expected, there is a decline in the CPUE since 2011. However, there is also some evidence of a broader size distribution of the fish being caught from 2011 to 2014 which suggests the fishery is less reliant on a single year class. Nevertheless, some concern remains on whether another strong year class will increase CPUE and stock biomass in the future. At SARC 58 industry indicated that signs of another large year class has recently entered the catch but are not yet reflected in the data or projections used for that assessment. In this data update the extra small market category has increased in 2013. From 2012 to 2013 landings have more than doubled in the extra small market category (Table 3). There are some indications in the catch at length and increases in catch of the extra small, small and kitten categories in 2013 and 2014 which may suggest that a recent stronger year class has begun to enter the fishery. However, it may be too early to quantify the exact strength of this new year class at this time.

Conclusions

Landings have remained between 814 and 845 mt from 2012 to 2014. Updated CPUE has declined in 2013 and 2014 as a strong 1999 year class enters the large and extra large market categories which is similar to historical patterns of year class effects on CPUE. The catch continues to be comprised of a wide size distribution. Large fish remain an important component of the catch. In addition, there are signs of a strong year class entering the fishery with higher proportions of the catch in the extra small, small and kitten market categories which is also reflected in the catch at length. However determination of the strength of this year class is difficult since these fish have just recently begun to enter the fishery and are likely not yet fully selected.

Gary Shepherd, Mark Terceiro, and Paul Rago reviewed this report.

Table 1. Landings of tilefish in live metric tons from 1915-2014. Landings in 1915-1972 are from Freeman and Turner (1977), 1973-1989 are from the general canvas data, 1990-1993 are from the weighout system, 1994-2003 are from the dealer reported data, and 2004-2014 is from Dealer electronic reporting. - indicates missing data. * Preliminary data retrieved on 2/3/15.

year	mt	year	mt	year	mt
1915	148	1960	1,064	2005	676
1916	4,501	1961	388	2006	907
1917	1,338	1962	291	2007	749
1918	157	1963	121	2008	737
1919	92	1964	596	2009	864
1920	5	1965	614	2010	922
1921	523	1966	438	2011	864
1922	525	1967	50	2012	834
1923	623	1968	32	2013	845
1924	682	1969	33	2014	*814
1925	461	1970	61		
1926	904	1971	66		
1927	1,264	1972	122		
1928	1,076	1973	394		
1929	2,096	1974	586		
1930	1,858	1975	710		
1931	1,206	1976	1,010		
1932	961	1977	2,082		
1933	688	1978	3,257		
1934	-	1979	3,968		
1935	1,204	1980	3,889		
1936	-	1981	3,499		
1937	1,101	1982	1,990		
1938	533	1983	1,876		
1939	402	1984	2,009		
1940	269	1985	1,961		
1941	-	1986	1,950		
1942	62	1987	3,210		
1943	8	1988	1,361		
1944	22	1989	454		
1945	40	1990	874		
1946	129	1991	1,189		
1947	191	1992	1,653		
1948	465	1993	1,838		
1949	582	1994	786		
1950	1,089	1995	666		
1951	1,031	1996	1,121		
1952	964	1997	1,810		
1953	1,439	1998	1,342		
1954	1,582	1999	525		
1955	1,629	2000	506		
1956	707	2001	874		
1957	252	2002	851		
1958	672	2003	1,130		
1959	380	2004	1,215		

Table 2. Total commercial and vessel trip report (VTR) landings in live mt and the commercial catch-per-unit effort (CPUE) data used for tilefish. Dealer landings before 1990 are from the general canvas data. CPUE data from 1979 to the first half of 1994 are from the NEFSC weighout database, while data in the second half of 1994 to 2012 are from the vtr system (below the dotted line). Effort data are limited to longline trips which targeted tilefish (= or >75% of the landings were tilefish) and where data existed for the days absent. Nominal CPUE series are calculated using landed weight per days absent minus one day steam time per trip. Da represents days absent.

	Weighout		Commerical CPUE data subset								
	& Dealer	vtr	interview	No.	% interview	No.	subset	days	No.	da per	nominal
year	landings	landings	landings	interviews	trips	vessels	landings	absent	trips	trip	cpue
1979	3,968		0.0	0	0.0%	20	1,807	1,187	330	3.6	1.93
1980	3,889		0.8	1	0.3%	18	2,153	1,390	396	3.5	1.99
1981	3,499		35.0	4	1.2%	21	1,971	1,262	333	3.8	1.95
1982	1,990		90.7	13	5.7%	18	1,267	1,282	229	5.6	1.10
1983	1,876		85.8	16	8.9%	21	1,013	1,451	179	8.1	0.73
1984	2,009		140.1	25	18.2%	20	878	1,252	138	9.1	0.72
1985	1,961		297.1	64	30.6%	25	933	1,671	209	8.0	0.59
1986	1,950		120.7	31	16.5%	23	767	1,186	188	6.3	0.71
1987	3,210		198.5	38	18.5%	30	1,014	1,343	206	6.5	0.82
1988	1,361		148.2	30	19.4%	23	422	846	154	5.5	0.56
1989	454		92.8	11	15.7%	11	165	399	70	5.7	0.46
1990	874		32.4	8	11.9%	11	241	556	68	8.2	0.45
1991	1,189		0.8	3	2.8%	7	444	961	107	9.0	0.48
1992	1,653		58.0	9	8.6%	13	587	969	105	9.2	0.62
1993	1,838		71.9	11	10.5%	10	571	959	105	9.1	0.61
1994	-		0	0	0.0%	7	127	385	42	9.2	0.34
1994	786	30				4	53	150	18	8.3	0.37
1995	666	547				5	466	954	99	9.6	0.50
1996	1,121	865				8	822	1,318	134	9.8	0.64
1997	1,810	1,439				6	1,427	1,332	133	10.0	1.09
1998	1,342	1,068				9	1,034	1,517	158	9.6	0.70
1999	525	527				10	516	1,185	133	8.9	0.45
2000	506	446				11	421	932	110	8.5	0.47
2001	874	705				8	691	1,046	116	9.0	0.68
2002	851	724				8	712	951	114	8.3	0.78
2003	1,130	790				7	788	691	101	6.8	1.22
2004	1,215	1,153				12	1,136	811	134	6.1	1.54
2005	676	808				11	802	470	93	5.1	1.95
2006	907	870				12	852	682	105	6.5	1.35
2007	749	710				12	691	727	101	7.2	1.01
2008	737	675				14	672	1,119	124	9.0	0.62
2009	864	812				12	800	1,106	130	8.5	0.75
2010	922	871				11	853	694	108	6.4	1.33
2011	864	822				9	781	517	89	5.8	1.68
2012	834	799				12	795	651	100	6.5	1.32
2013	845	844				10	796	831	112	7.4	1.02
2014	814	790				11	716	961	120	8.0	0.78

Table 3. Landing (metric tons) by market category. A large/medium (lg/med) code was developed in 2013 and 2014. Smalls and Kittens were combined since these categories possess similar size fish.

year	xs	small & kittens	medium	lg/med	large	xl	unclassified	total
1990	0	38	103	-	46	0	687	874
1991	0	59	154	-	85	0	891	1189
1992	0	330	88	-	86	0	1,149	1653
1993	0	368	206	-	66	4	1,193	1838
1994	0	19	89	-	54	7	617	786
1995	0	99	88	-	91	2	386	666
1996	0	592	149	-	156	2	221	1121
1997	0	1,130	260	-	111	2	307	1810
1998	0	475	700	-	103	6	58	1342
1999	0	181	201	-	106	8	29	525
2000	0	210	153	-	115	8	20	506
2001	0	564	161	-	124	6	19	874
2002	0	369	311	-	128	3	40	851
2003	0	776	171	-	144	5	35	1130
2004	20	397	523	-	129	9	137	1215
2005	0	18	335	-	149	1	173	676
2006	1	16	233	-	369	1	287	907
2007	3	96	142	-	397	4	106	749
2008	17	149	195	-	299	17	60	737
2009	35	334	179	-	226	28	61	864
2010	16	269	373	-	166	17	81	922
2011	6	142	339	-	216	10	152	864
2012	8	95	308	-	285	17	121	834
2013	19	138	281	14	290	21	82	845
2014	13	227	195	88	238	47	4	814

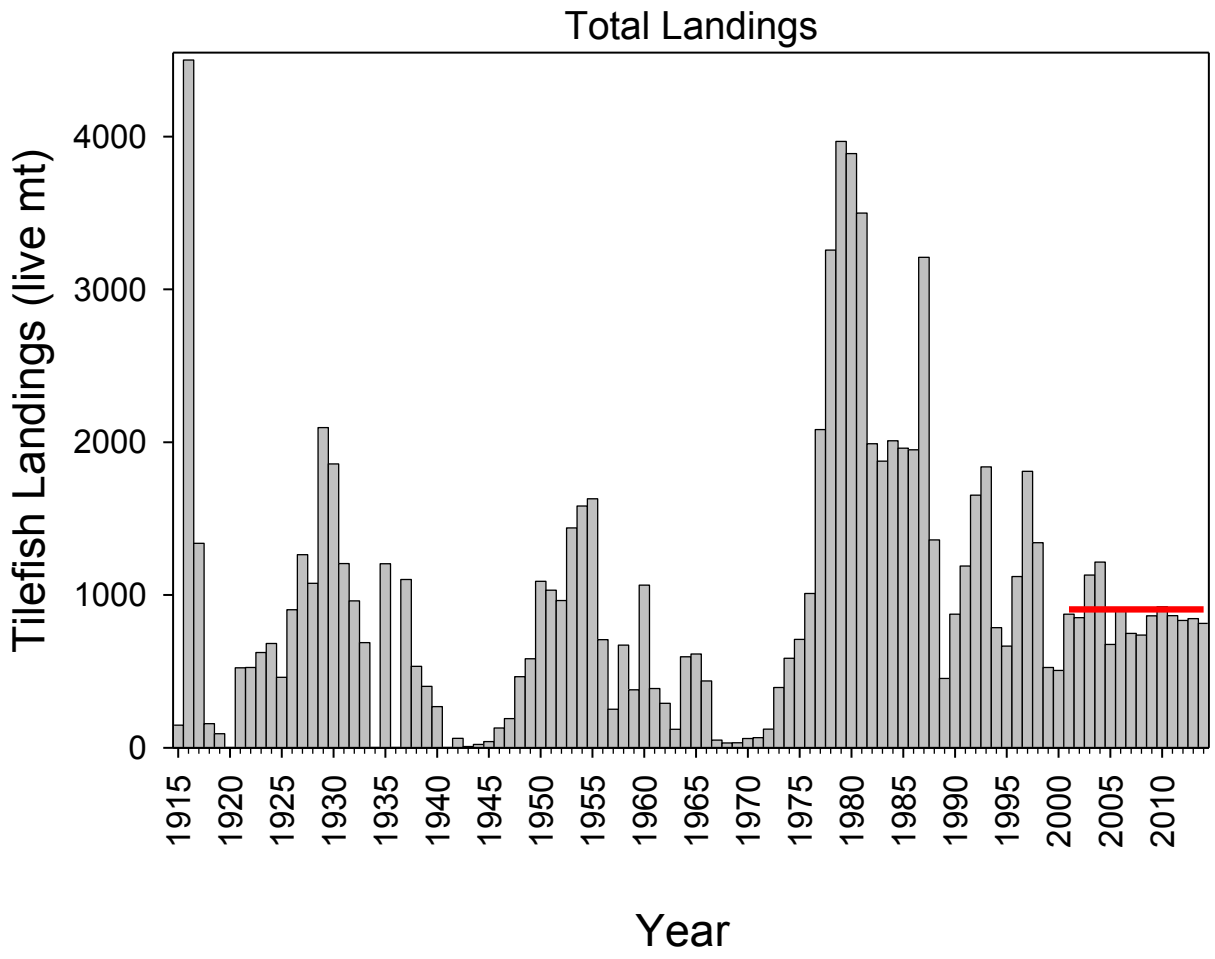

Figure 1. Landings of tilefish in metric tons from 1915-2004. Landings in 1915-1972 are from Freeman and Turner (1977), 1973-1989 are from the general canvas data, 1990-1993 are from the weighout system, 1994-2003 are from the dealer reported data, and 2004-2012 is from dealer electronic reporting. Preliminary landings data for 2012 retrieved on 2/5/13. Red line is the constant TAC of 905 mt.

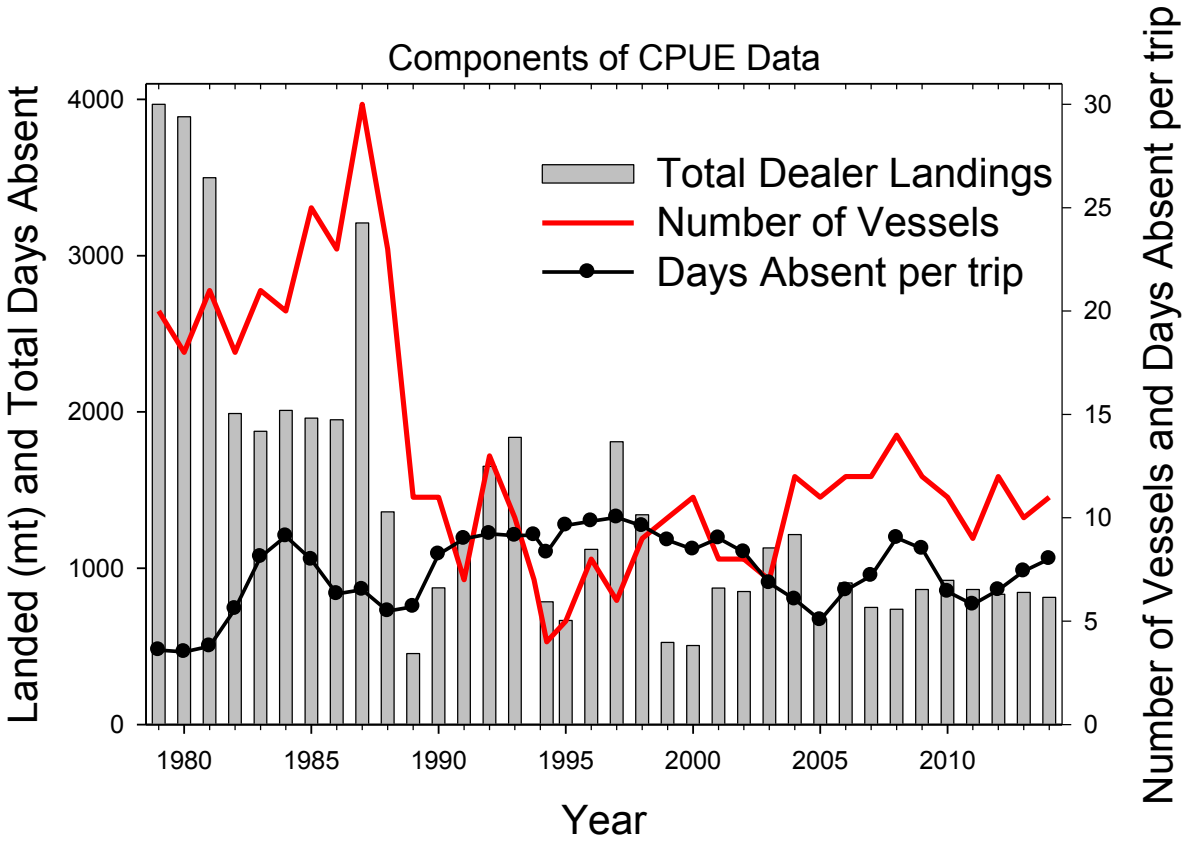

Figure 2. Number of vessels and length of trip (days absent per trip) for trips targeting tilefish (= or >75% tilefish) from 1979-2014. Total Dealer landings are also shown.

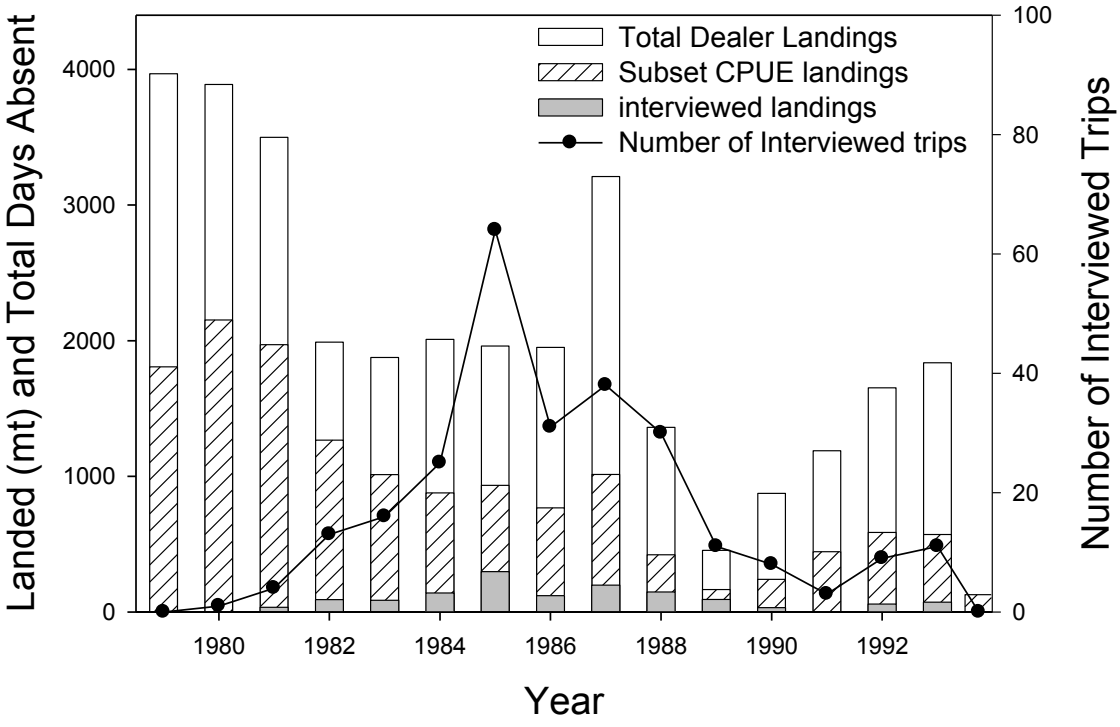

Figure 3. Number of interviewed trips and interviewed landings for trips targeting tilefish (= or >75% tilefish) for the Weighout data from 1979-1994. Total Weighout landings and the subset landings used in CPUE estimate are also shown.

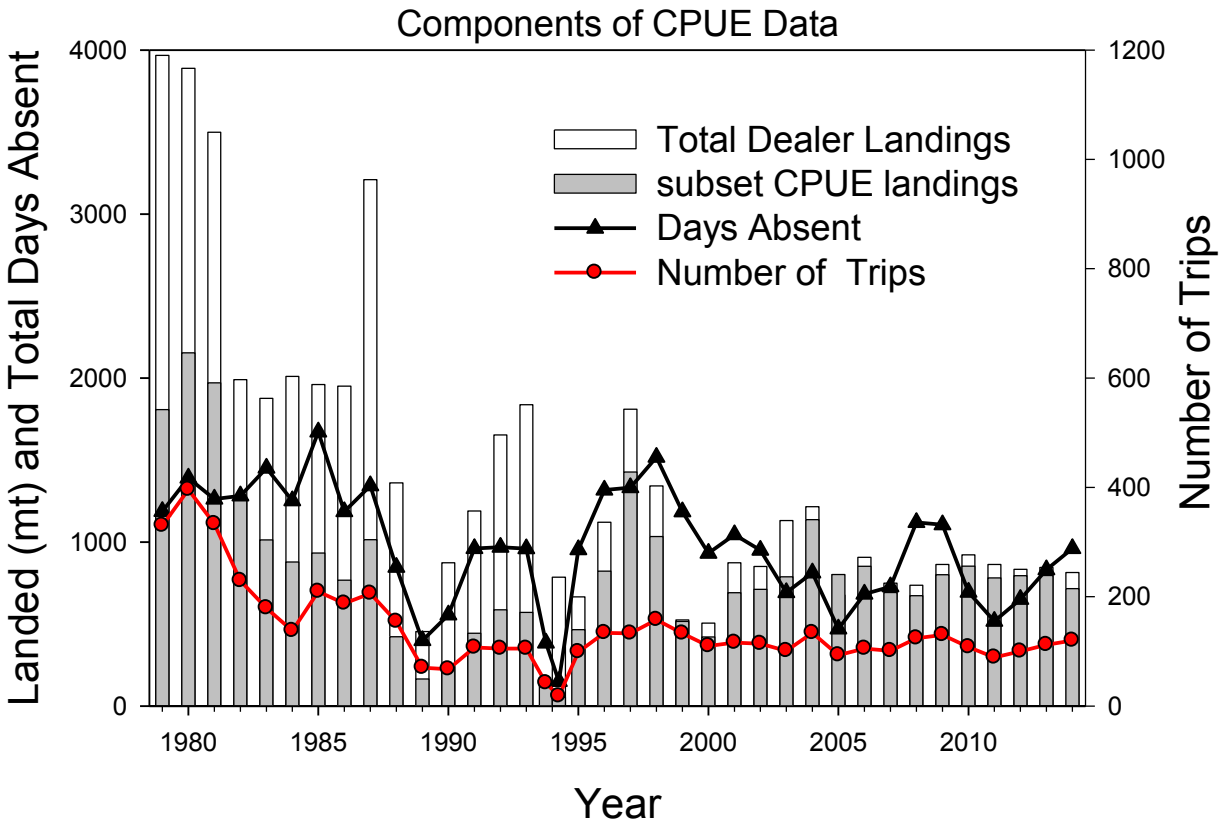

Figure 4. Total number of trips and days absent for trips targeting tilefish (= or >75% tilefish) from 1979-2014. Total Dealer and CPUE subset landings are also shown

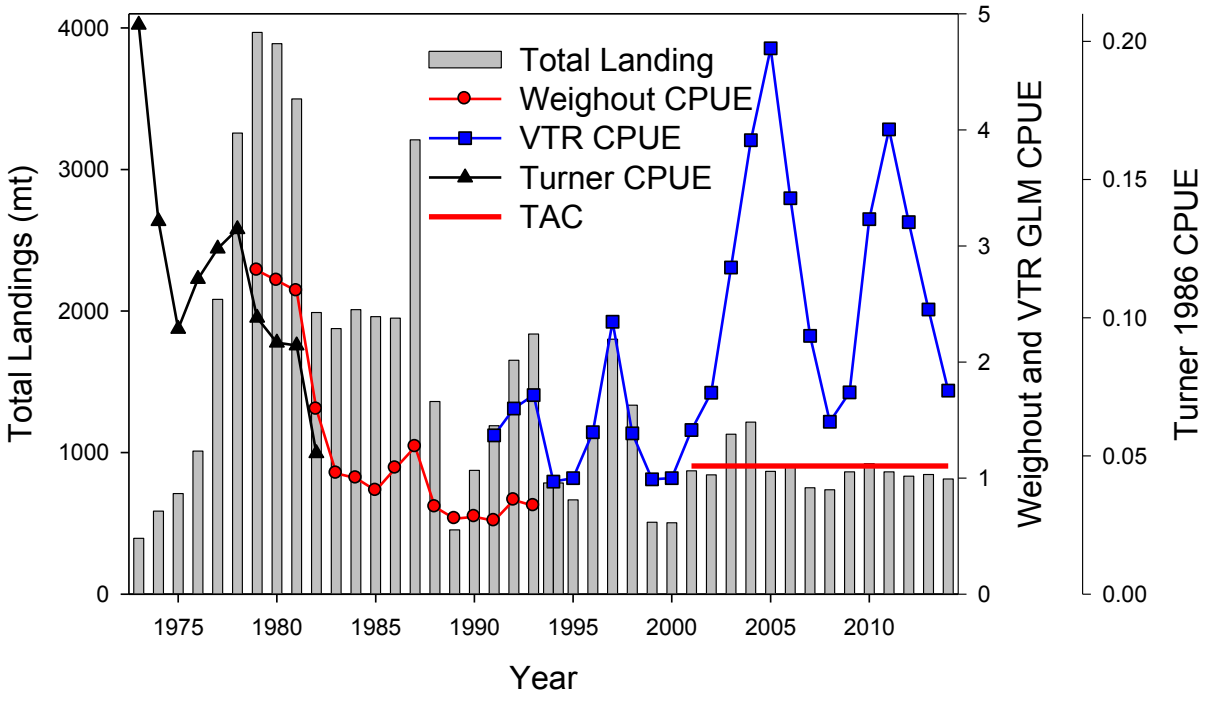

Figure 5. GLM CPUE for the Weighout and VTR data split into two series with additional New York logbook CPUE data from three vessels (1991-1994) added to the VTR series. Four years of overlap between Turner's and the Weighout CPUE series can also be seen. ASAP relative changes in qs amount CPUE series were not incorporated into the plot. Assumed total landings are also shown. Landing in 2005 was taken from the IVR system. Red line is the constant TAC of 905 mt.

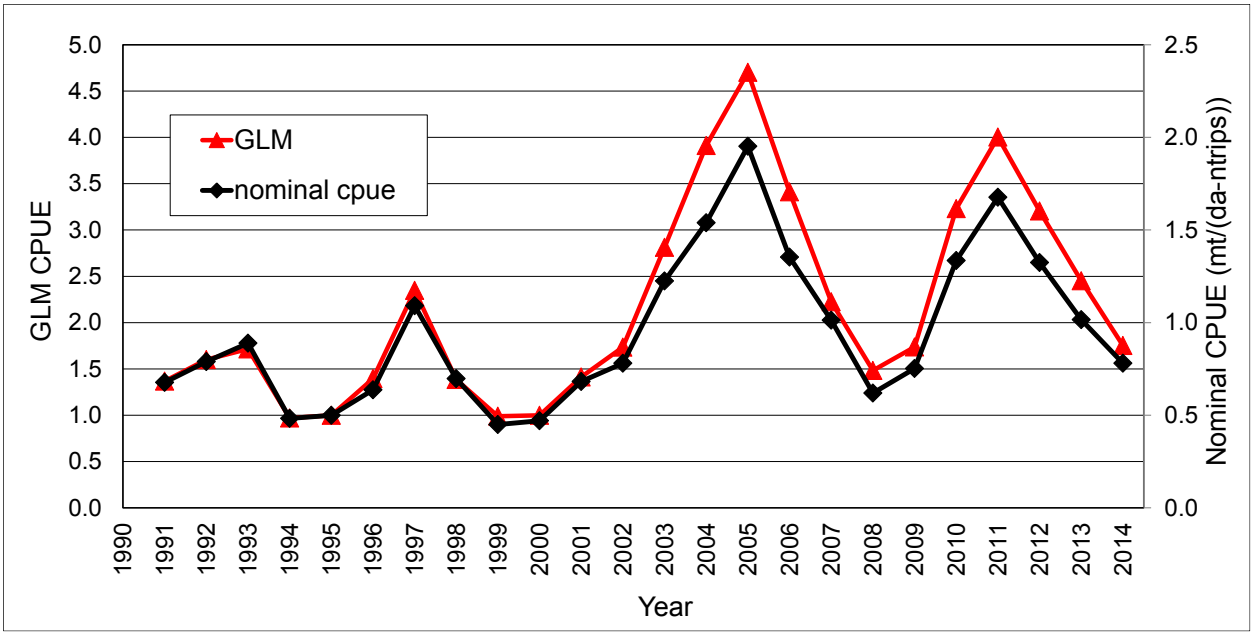

Figure 6. Comparison of the nominal and GLM VTR CPUE indices for golden tilefish with additional New York logbook CPUE data from three vessels (1991-1994) added to the VTR series.

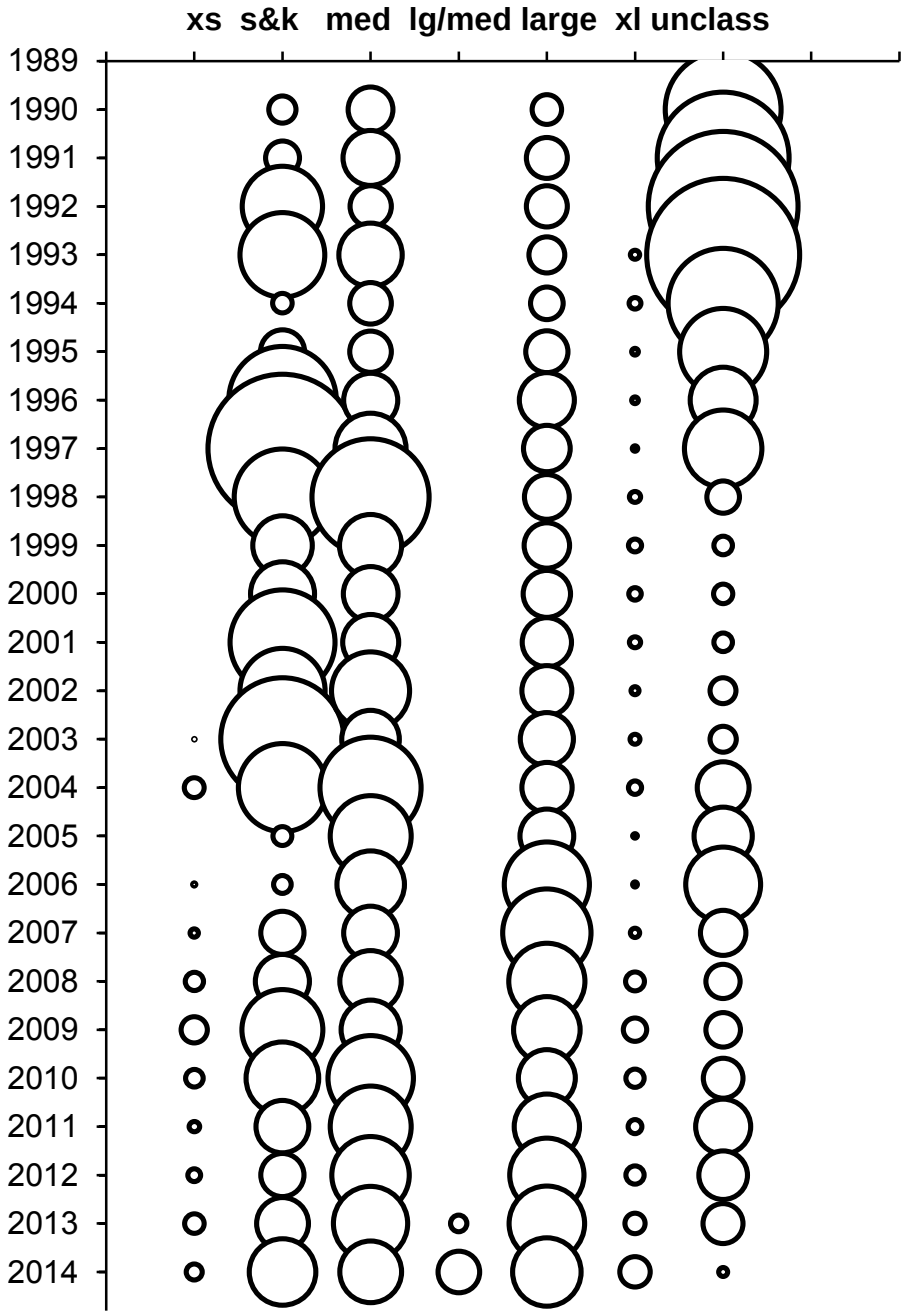

Figure 7. Bubble plot of Golden tilefish landings by market category. Large/medium market category code was added in 2013 and 2014. Smalls and Kittens (s&k) were combined since these categories possess similar size fish.

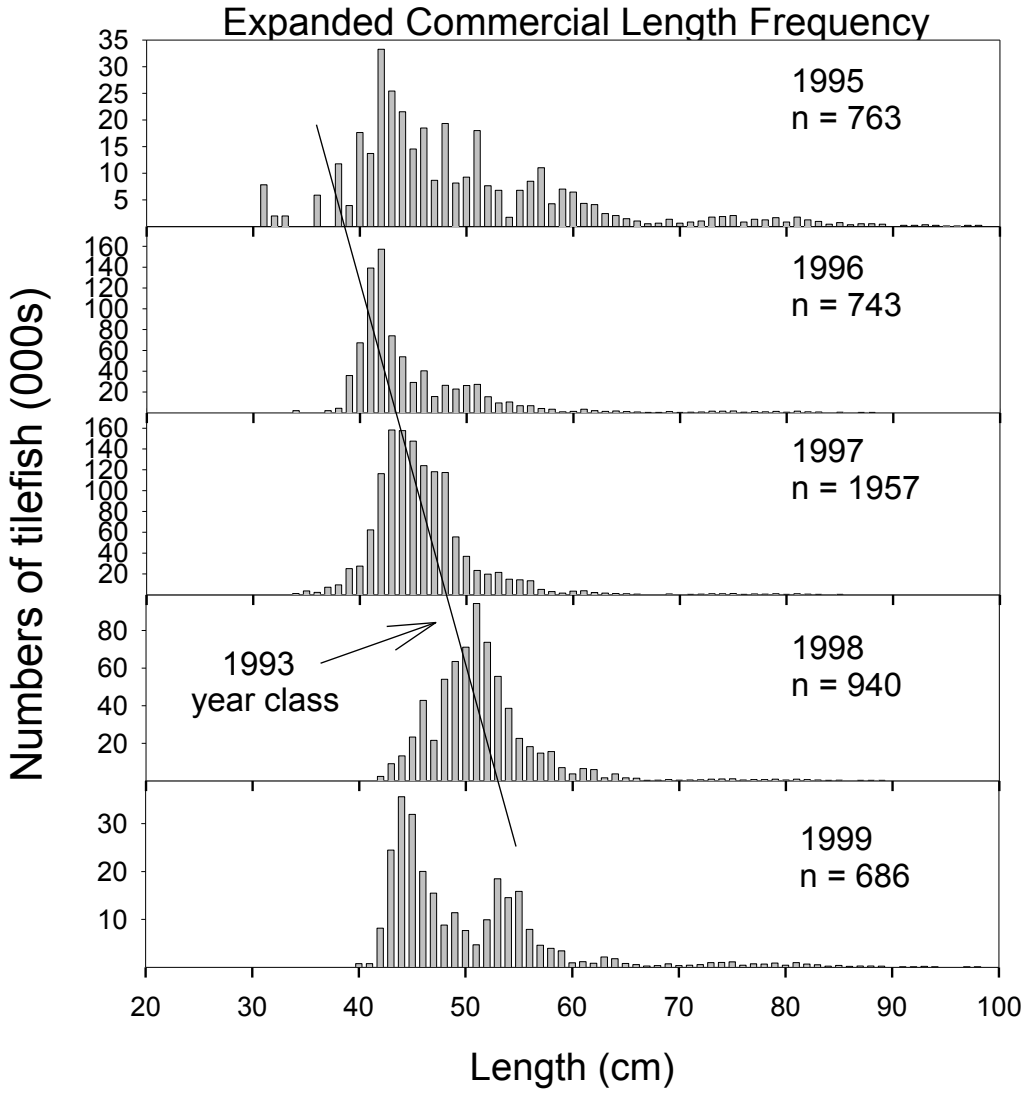

Figure 8. Expanded length frequency distributions by year. Large market category lengths used from 1995 to 1999 were taken from years 1996, 1998, and 1998. Smalls and kittens were combined and large and extra large were also combined.

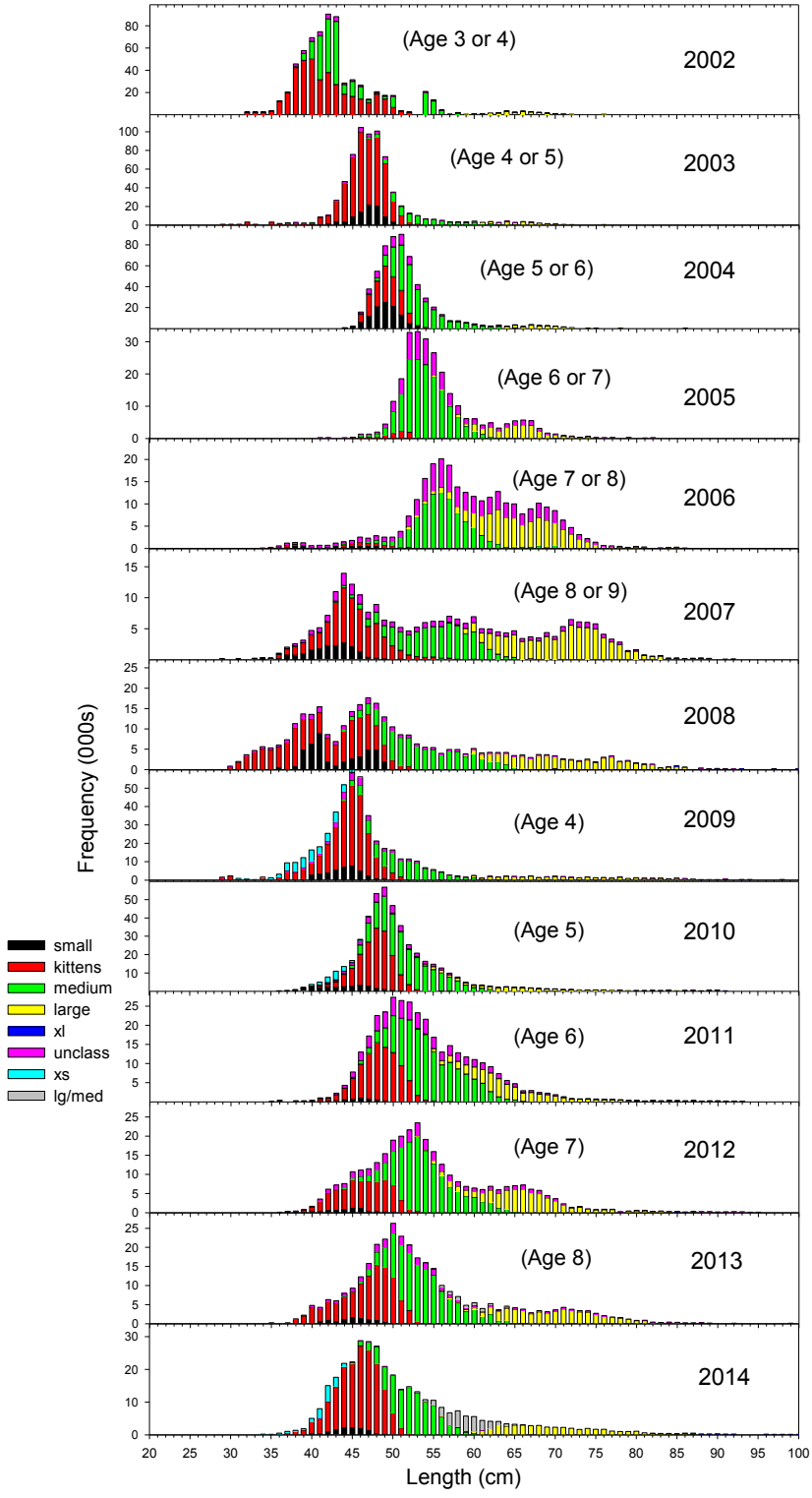

Figure 9. Expanded length frequency distributions from 2002 to 2014. Kittens lengths were used to characterize the extra small category in 2013. Y-axis is allowed to rescale.

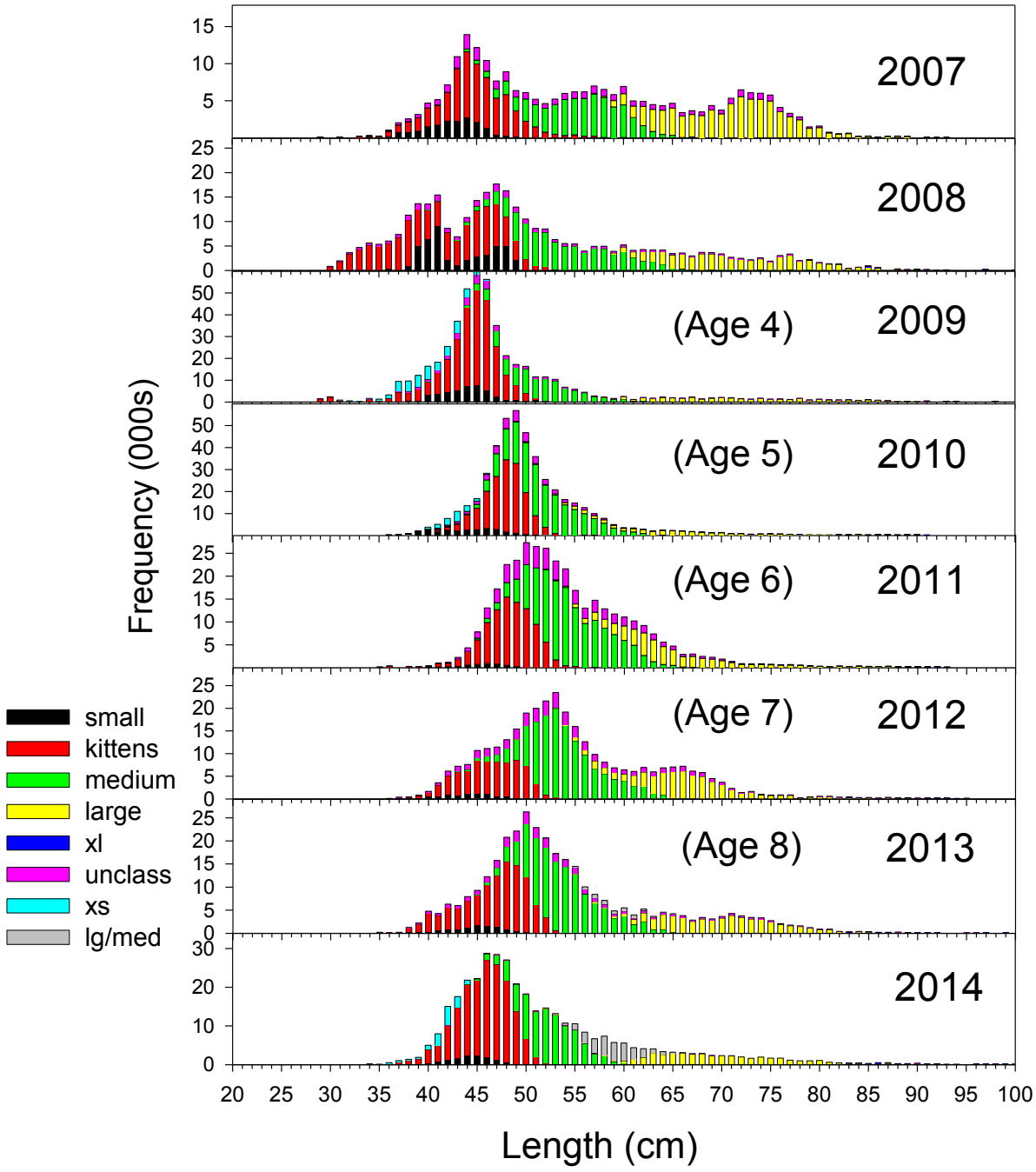

Figure 10. Expanded length frequency distributions from 2007 to 2014. No lengths for extra small (xs) exist in 2013. Kittens lengths were used to characterize the extra small category in 2013. Y-axis is allowed to rescale.

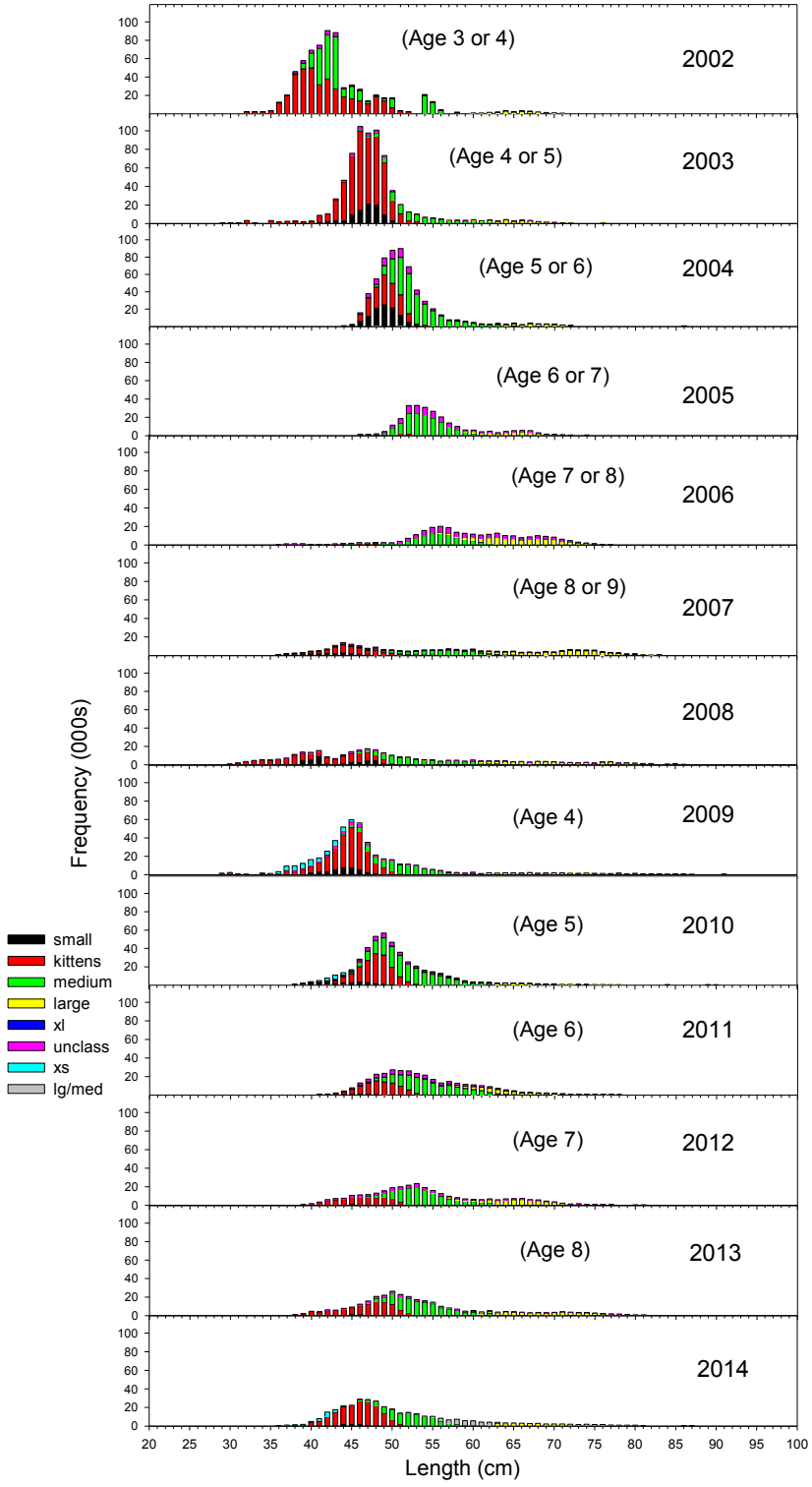

Figure 11. Expanded length frequency distributions from 2002 to 2014. Kittens lengths were used to characterize the extra small category in 2013. Y-axis scales is fixed.

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Richard B. Robins, Jr., Chairman | Lee G. Anderson, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: February 27, 2015

To: Chris Moore, Executive Director

From: José Montañez, Staff

Subject: Golden Tilefish Specifications Review for 2016 Fishing Year

As part of the 2015-2017 multi-year specification process for Tilefish, the Scientific and Statistical Committee (SSC) and Council will review the most recent information to determine whether modification of the current 2016 specifications is warranted.

The NMFS Northeast Fisheries Science Center provided a data update for golden tilefish to support this review, which includes data on commercial landings, catch-per-unit-effort, market category, and size composition. Based on a review of this information, staff recommends no change to the 2016 fishing year specifications. In 2016, the SSC and Council will again review the most recent information to determine if any changes to the 2017 fishing year are warranted.