

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

DIVISION OF MARINE FISHERIES



2018 Finfish Sector Management Plan

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INTRODUCTION

This plan is developed and updated annually pursuant to RI Gen. Law 20-2.1-9(5), which states that the Director of the Department of Environmental Management (DEM) develop conservation and management plans in support of regulations that may restrict the issuance of commercial fishing licenses. Such restrictions were clearly contemplated by the Rhode Island General Assembly as a means to limit fishing effort and to rebuild depleted fishery resources. As articulated in statute, these plans shall focus on fishery resources with the greatest value to the state.

The primary goal for quota-managed fisheries is to maintain open seasons with economically viable possession limits while minimizing regulatory discards, avoiding harvest overages, maximizing harvest opportunities, and assuring equitable access to the fishery. However, due to the multi-species nature of the commercial fishing industry, increased effort can result in shorter seasons and higher discards for many species. Information contained in this plan seeks to aid in understanding if management goals are being realized under existing management.

To meet the purposes of the act, the commercial licensing program created two licensing endorsement categories for the commercial finfish fishery: *Restricted Finfish* and *Non-Restricted Finfish*.

The *Restricted* category is comprised of those finfish species in which commercial access to the fishery is limited (i.e., restricted), while species in the *Non-Restricted* category are available to all participants. At this time, five (5) finfish species are included in the restricted category: striped bass, scup (for part of the year), summer flounder, black sea bass, and tautog. Two other species, menhaden and monkfish, have been considered for inclusion in this category, however restrictions on effort were achieved through other methods including gear endorsements (menhaden) and management plan changes (monkfish). Species included in the *non-restricted* category include all species of regulated finfish not included in the restricted category. Entry into this endorsement category is currently open to all RI residents.

Within each endorsement category is an *exit/entry ratio*, or the number of new individual license opportunities provided for each license not renewed. Exit/entry ratios are reviewed annually by the Industry Advisory Committee (IAC) and Rhode Island Marine Fisheries Council (RIMFC), and presented for public comment at a public hearing in accordance with the requirements of the Administrative Procedures Act (RIGL Chapter 42-35). Determining the level of fishing effort, the impacts to the resource that a particular license type collectively represents, and thus determining the number of licenses desired in a given fishery as a means to limit such effort, is a primary goal of the licensing program.

RESTRICTED FINFISH

BLACK SEA BASS

Stock Status: The black sea bass stock is no longer considered overfished and overfishing is not occurring based upon the 2016 benchmark stock assessment that uses a forward projection statistical catch-at-age model called ASAP. In 2015, the terminal year of the assessment, Spawning Stock Biomass (SSB) was estimated to be 48.9 million pounds, a value above the target of 21.3 million pounds. Fishing mortality (F) was estimated to be 0.27, well below the target of 0.36.

Management Program: The black sea bass stock is managed jointly by the Atlantic States Marine Fisheries Commission (ASMFC) and the Mid-Atlantic Fishery Management Council (MAFMC). Rhode Island's share of the commercial coastwide quota is 11%. Through advice from the RIMFC and industry, DEM adopted regulations to allocate the RI quota into five seasonal sub-periods. The regulations also specified possession limits within each season. Current commercial regulations are as follows:

Min. Size	Target Allocation	Season	Target Allocation (lbs)	Possession Limit (lbs/vsl)	Days Closed
11"	25%	Jan. 1 – April 30	113,867	750/week	Open 7 Days
	25%	May 1 – June 30	115,506	50/day	Friday
	19.5%	July 1 – July 31	90,286	50/day	Friday
	0%	Aug. 1 – Sept. 14	0	CLOSED	Closed 7 Days
	19.5%	Sept. 15 – Oct. 31	81,946	50/day	Friday
	11%	Nov. 1 – Dec. 31	51,277	100/day	Open 7 Days

Performance of Fishery and Quotas: The coastwide quota for 2018 has been reviewed by the MAFMC's SSC and is anticipated to be 8.94 million pounds, a reduction of 15% from 2017. The first sub-period which opened on January 1 experienced both decreases and increases in the weekly possession limit in order to fully harvest the quota, with no early closures. The sub-period opening on May 1 closed early on June 9, however the sub-period beginning on July 1 opened 2 days early due to a quota underage of ~12,000 pounds in the previous sub-period. The sub-period beginning on July 1 closed early on July 20.

Marine Fisheries Management Recommendation: Maintain effort at or below current levels in 2018 and maintain as a restricted species.

SCUP

Stock Status: The scup stock is not considered overfished and overfishing is not occurring. The scup stock is assessed using a statistical catch-at-age model. An update

assessment was undertaken in 2017 and this model indicated that the 2016 SSB level for the scup stock is 397 million pounds, well above the SSB target of 192 million pounds. SSB is projected to remain above the target as indicated in the most recent assessment information. The overfishing definition for the scup resource is defined as $F40\% = F_{msy} = 0.220$. The most recent terminal year reference point from the stock assessment update for scup concluded that overfishing was not occurring with $F2016 = 0.139$.

Management Program: Regional management of scup is the shared responsibility of the MAFMC and ASMFC. The Fishery Management Plan (FMP) for scup sets annual coast-wide quota specifications, of which RI receives 56.19% divided into three sub-periods. During the two winter sub-periods (January – April; November – December), the quota is available coast-wide and is managed through daily possession limits. The federal period structure will change in 2018, and Winter 2 will begin in October. The period allocations do not change even though the period length has changed. In RI, scup is classified as a non-restricted species during the two federal winter sub-periods, whereas in the summer it is classified as a restricted species. A state-by-state quota system is in place for the summer sub-period (May 1 – October 31), whereby quotas are distributed to the states based upon their percentage share of commercial landings for the period May through October 1983–1992. RI further divides the state quota into a general category (i.e., gear types other than floating fish traps) allocation (40%) and a floating fish trap allocation (60%), with allocations based on historical landings. To maintain an open season throughout the summer, floating fish trap allocation is routinely transferred to the general category fishery dependent upon available remaining quota. Current commercial regulations are as follows:

Min. size	Seasons	Sub-periods	Quota		Starting Poss. limit
9"	Winter I: (1/1 – 4/30)		Coastwide		50,000 lbs/vsl/day
	Summer: (5/1 – 10/31)	Gen. Cat. Summer: (5/1 – 9/17)	40% of sub-period quota	2/3 of Gen. Cat. quota	10,000 lbs/vsl/wk
		Gen. Cat. Fall: (9/18 – 10/31)		1/3 of Gen. Cat. quota	10,000 lbs/vsl/wk
		FFT: (5/1 – 10/31)	60% of sub-period quota		Unlimited
	Winter II: (11/1 – 12/31)		Coastwide		2,000/18,000 lbs/vsl/day*

Performance of Fishery and Quotas: The floating fish trap sector has harvested 9% of its quota so far in 2017. To date, 62% of the floating fish trap quota has been transferred in to the general category fishery.

The coastwide quota for 2018 has been reviewed by the MAFMC’s Scientific and Statistical Committee (SSC) and is anticipated to be 27 million pounds, an increase of 22.5% from 2017. To date, no early closures or possession limit changes have been implemented indicating current management measures are effective (Table 2).

Marine Fisheries Management Recommendation: Recommend maintaining effort in 2018 at current levels or allowing for small increases in effort given good stock status and increasing quotas during the summer state quota period. This species should be maintained at its current restricted category in the state allocated summer period and non-restricted category during the winter federal sub periods.

STRIPED BASS

Stock Status: The most recent Atlantic striped bass stock assessment update conducted in 2016 showed that the stock is not overfished and overfishing is not occurring (ASMFC 2016). The assessment update estimated SSB in 2015 to be 129 million pounds, above the threshold and below the target, 127 million pounds and 159 million pounds respectively. Total F was estimated to be F=0.16, between the threshold and target levels, F=0.22 and F=0.18 respectively. The next benchmark stock assessment is scheduled to be peer reviewed at the end of 2018.

Management Program: Striped bass are managed by ASMFC through Amendment 6 to the interstate FMP, which requires possession limits for the recreational fishery, state quotas for the commercial fishery, and minimum sizes for both the commercial and recreational fisheries.

In Rhode Island state waters, regulations include minimum sizes, possession limits, gear and area restrictions, seasons, and quotas. The commercial quota is divided between two sectors, floating traps (39%) and a general category (61%). The general category quota is then divided into two sub-periods, where the first sub-period is allocated 70% and the second sub-period is allocated the remaining 30% of the general category quota. Current commercial regulations are as follows:

Commercial General Category	Min. Size	Season	Allocation	Sub-allocation	Possession Limit
Commercial General Category	34"	May 28 – Aug. 31	61%	70%	5 fish/day
		Sept. 10 – Dec. 31		30%	5 fish/day
Commercial Floating Fish Traps	26"	April 1 – Dec. 31	39%	N/A	Unlimited

Other key aspects of the current regulations include Friday and Saturday closures for the general category fishery, and the ability for DEM to transfer unused floating fish trap quota into the general category beginning on October 15 of each year. This transfer provision has allowed for the full harvest of the RI striped bass quota each year.

Performance of Fishery and Quota: The RI commercial striped bass quota for the general category in 2018 is 111,459 pounds, which is split between two sub-periods with 70% allocated to the first sub-period and 30% to the second. As of the writing of this plan, the first sub-period quota was fully harvested in 29 days with an average of 9,087 pounds. The first sub-period was originally closed after 25 fishing days as it was projected that the quota would be reached. Due to lower than average daily landings, the last few days the fishery was open, there was an underage of ~12,000 pounds. As a result, the fishery was re-opened for four additional days. During these four days, daily landing rates were more than double what was anticipated resulting in the aforementioned overage. The second sub-period has ~24,000 pounds available for harvest.

The floating fish trap quota is 70,113 pounds in 2018, minus any overages that may occur in 2017. As of the writing of this report, 43% of the floating fish trap quota has been harvested with ~40,000 pounds remaining.

Marine Fisheries Management Recommendation: Maintain 2018 effort at or below current levels and maintain as a restricted species.

SUMMER FLOUNDER

Stock Status: In 2016, the stock assessment and biological reference points for the summer flounder stock were updated and reviewed through an update assessment process. The update assessment results, using a statistical catch-at-age modeling approach (ASAP), indicated that the summer flounder resource is not overfished but is experiencing overfishing relative to the established biological reference points in 2015. The summer flounder stock is defined as overfished if the stock's SSB falls below the biomass (SSB) threshold, currently defined as $\frac{1}{2}SSB_{MSY} = 68.78$ million lbs. The SSB for 2015 was estimated to be 79.90 million lbs. This is 42% below the SSBtarget = 137.55 million lbs. The overfishing definition for the summer flounder stock is defined as $F_{msy} = 0.31$. The 2015 fishing mortality rate estimate ($F_{2015} = 0.39$) is above the fishing mortality reference point. Fishing mortality in 2015 may have been higher, as a retrospective analysis indicated that the current assessment method tends to underestimate F in recent years. A data update done in 2017 did not indicate any improvement in stock status.

Management Program: Regional management of summer flounder is the shared responsibility of the MAFMC and ASMFC. In state waters, DEM regulations provide a framework to manage the annual summer flounder quota allocated to RI through possession limits and seasons. Current commercial regulations are as follows:

Min. size	Target Allocation	Sub-period	Starting Poss. Limit (lbs/vsl/day)	Starting Aggregate Poss. Limit (lbs/vsl)	Days Closed
14"	54%	Winter (1/1 – 4/30)	200	1,300/bi-week	Open 7 days
	35%	Summer (5/1 – 9/15)	50	200/week	Fri./Sat./Sun.
	11%	Fall (9/16 – 12/31)	100	No agg. program	Open 7 days

Performance of Fishery and Quota: The coastwide quota for 2018 has been reviewed by the MAFMC’s SSC and is anticipated to be 11.05 million pounds, an increase of 17% from 2017. To date, no early closures or possession limit changes have been implemented indicating current management measures are effective (Table 2).

Marine Fisheries Management Recommendation: Due to the continued low quota, it is recommended that effort remain at or below current levels. This species should be maintained as a restricted category species.

TAUTOG

Stock Status: The ASMFC Tautog Technical Committee completed the most recent benchmark stock assessment of tautog in 2015 (ASMFC 2015). This assessment was approved for management use, and is the first approved assessment to create regionally discrete assessments for this stock. The benchmark assessment was then updated in 2016 (approved for management use in February 2017). Rhode Island (RI) is in a northern region with Massachusetts (MARI). The assessment results indicate in the MARI region the stock is not overfished as spawning stock biomass is at 2,196 metric tons (mt), which is above the threshold of 2,004 mt, but under the target of 2,684 mt. Additionally, overfishing is not occurring; currently the fishing mortality 3 year average is 0.23, below both the target (0.28) and the threshold (0.49).

RI has been proactive in its management of tautog, making management adjustments through the 2000s even with no mandate to do so. Despite these reduction measures, the tautog stock continues to be subject of high recreational landings in the fall months, and is not showing much in the way of rebuilding. Commercial landings have not risen appreciably since plan implementation in RI due to the constraint of a quota.

Management Program: Regional management of the tautog resource is conducted by ASMFC through Addendum VI to the Tautog FMP, which was adopted in 2011. The

FMP in part requires a reduction in fishing mortality in order to achieve an appreciable increase in spawning stock biomass. States were required to implement regulations that meet the required reductions by the start of their respective fisheries in 2012. Although not specifically required by the FMP, RI established a commercial quota, which in part achieves the fishing mortality targets required by the FMP. The state commercial quota has not increased in several years, and is managed through a combination of seasons, quotas, and possession limits. In 2016, the commercial quota of 51,348 pounds was divided equally into three seasons with a daily possession limit of 10 fish. In 2017, the distribution of the quota was changed, increasing the spring and fall seasons while reducing the summer, current commercial regulations are as follows:

Min. Size	Target Allocation	Sub-period	Target Allocation (lbs)	Possession Limit
16"	40%	April 15 – May 31	20,539	10 fish/day
	20%	Aug. 1 – Sept. 15	10,270	10 fish/day
	40%	Sept. 16 – Dec. 31	20,539	10 fish/day

Performance of Fishery and Quota: The state quota for 2018 is anticipated to be 51,348 pounds (minus any 2017 overages), consistent with 2017. In order to keep the tautog fishery open throughout each of the defined seasons, a substantial increase in the quota would be needed. Such an increase is not realistic due to the stock status. Spring is typically the hardest season to manage with early season closures, and high discard mortality. However, a switch in period allocations for the 2017 fishing year was made (an additional 3,432lbs was added) the spring season gained an additional 10 days before closing in 2017. There was an overage of 1,673lbs in 2017 in this spring sub season.

Marine Fisheries Management Recommendation: Maintain effort in 2018 at or below current levels and maintain as a restricted species.

LICENSING RECOMMENDATIONS- RESTRICTED FINFISH ENDORSEMENT

In 2015, due to concerns about the ageing commercial fishing population, a 2:1 exit/entry ratio for the restricted finfish endorsement was changed to 1:1 to provide for a limited increase of new licenses to replace effort from those licenses not renewed. This ratio was adopted to be reflective of both current fishing effort, and assuming that latent effort was accounted for with the activity requirement of the license. Referring to Table 1, the number of licenses eligible to harvest restricted finfish has remained relatively stable in the last three years with 1055 licenses issued in 2015, 1054 in 2016 and 1055 in 2017. This indicates that the recommendation to increase the number of restricted finfish licenses issued annually has achieved the desired effect of maintaining consistent effort in the fishery.

Marine Fisheries Licensing Recommendation: In 2017, 1,055 licenses were issued with the ability to harvest restricted finfish in state waters (Table 1). Between 2016 and 2017, 16 restricted finfish licenses were not renewed (12 Multipurpose, 4 Principal Effort Licenses). Only 2 of these retired licenses had landings of restricted finfish in the prior year. Under the current exit/entry ratio regulations 18 PEL restricted finfish endorsements would be issued for 2018. It is anticipated that the 2018 fishery specifications for quota managed species (restricted finfish) will increase slightly or remain level. Marine Fisheries recommends maintaining effort at current levels by maintaining the 1:1 exit/entry ratio for the Principal Effort License (PEL) restricted finfish endorsement.

RI Marine Fisheries Council: The IAC met on August 10, and the Council met on October 2. No recommendations were offered for 2018 for any changes with the *Restricted Finfish endorsement* for 2018.

NON-RESTRICTED FINFISH

BLUEFISH

Stock Status: A benchmark stock assessment for bluefish completed in 2015 indicates that the stock is not overfished and overfishing is not occurring (NEFSC 2015). The assessment adopted new spawning potential ratio-based (SPR-based) reference points instead of using maximum sustainable yield-based (MSY-based) reference points as was used in previous assessments. This was due to the fact that there is a lack of information available regarding recruitment at smaller stock sizes, thus the stock-recruitment relationship is poorly defined. The assessment estimated spawning stock biomass in 2014, the terminal year of the assessment, to be 191 million pounds, a level above the SSB threshold but below the SSB target, 191 million and 223 million pounds respectively. The assessment also estimated fishing mortality in 2014 to be 0.157, well below the fishing mortality threshold ($F_{MSY\ PROXY} = F_{35\%SPR} = 0.19$).

Management Program: Regional management of bluefish is the shared responsibility of the ASMFC and MAFMC through Amendment 1 to the Bluefish FMP. Amendment 1 dictates that 17% of the resource shall be allocated to commercial fisheries which are controlled through state-by-state quotas. The remaining 83% of the resource is allocated to recreational fisheries which are controlled through a 15-fish bag limit. RI receives 6.8% of the coastwide bluefish commercial allocation and uses a minimum size limit, seasons, and possession limits to control harvest levels throughout the year. Current commercial regulations are as follows:

Min. Size	Sub-period	2018 Projected Allocation (lbs)	Possession Limit (lbs/vsl/wk)
12"	Jan. 1 – April 30	17,154	500
	May 1 – Nov. 11	529,585	6000
	Nov. 12 – Dec. 31	34,824	500

Performance of Fishery and Quota: In 2017 RI's commercial bluefish quota is 581,563 pounds. During the first sub-period in 2017, Marine Fisheries made several possession limit adjustments to maximize harvest and avoid going over the projected allocation. An underage of 5,839 pounds for the first sub-period was carried over into the second sub-period which is still in progress as of this report writing. The second sub-period currently has ~470,000 pounds remaining and due to lower than expected catch rates, Marine Fisheries was able to raise the weekly possession limit at the end of May to 10,000 pounds/vessel/week and again at the end of July to 15,000 pounds/vessel/week. The most recent ASMFC FMP review, detailing the 2014 and 2015 fishing years for the Atlantic coast, can be found on the ASMFC website (<http://www.asmfc.org/uploads/file/57b231d72016BluefishFMPReview.pdf>).

RI's initial commercial bluefish quota for 2018 is 493,160 pounds, a 19% increase from the initial 2017 quota and a 15% decrease from the final 2017 quota. The initial quota allocation for 2018 is subject to change depending on the performance of the recreational fishery in 2017 and any potential transfers that may occur from the recreational sector to the commercial sector.

Marine Fisheries Management Recommendation: Hold a public workshop and public hearing to discuss the efficacy of the 2017 management of bluefish and seek additional input on bluefish management for 2018 that would continue to control harvest through size limits, possession limits, and/or seasons. In the future, if effort increases and/or the commercial quota decreases, Marine Fisheries will re-assess whether bluefish needs to be placed in to the restricted species category.

COD

Stock Status: The 2015 George's Bank (GB) Atlantic cod (*Gadus morhua*) operational assessment was not accepted by the peer review panel. Therefore, the most recent biological reference points (BRPs) are from the SAW 55 benchmark assessment which shows historically low biomass (NEFSC 2013). SAW 55 estimated total biomass (SSB2011) at 13,216 mt; fishing mortality (F2011) at 0.43; the biomass threshold of $\frac{1}{2}$ Bmsy at 93,268 mt; and the fishing mortality target Fmsy proxy (F40%) at 0.18. The 2015 peer review concluded that the stock remains overfished based on the benchmark formulation used in SAW 55 (SSB2011 = 13,216 mt < $\frac{1}{2}$ SSBmsy = 93,268); however, overfishing status is considered unknown.

Management Program: Atlantic cod are managed under the New England Fishery Management Council (NEFMC) Northeast Multispecies FMP. RI State waters are considered part of the GB cod stock. The 2017 FY Annual Catch Limit (ACL) is unchanged from the 2016 FY at 730 mt (1,609,374 lbs). In an effort to satisfy statutory requirements to complement federal fishery management plans, RI has adopted a minimum size limit, daily possession limit, and state quota set at 1% of the GB ACL (equal to 16,093 lbs for the 2017 FY). Current management is as follows:

Min. Size	Season	Possession Limit (lbs/vsl/day)
22"	May 1 – April 30	1,000

Performance of Fishery and Quota: The state quota for cod has not been met since its inception in 2009. Between the 2009 and 2016 FYs total state-water landings have ranged from 5,233 lbs to 31,868 lbs. State-water landings for RI during the 2016 fishing year totaled 13,507 lbs, which is 84% of the RI state-water quota.

Cod abundance in state waters is ephemeral and potential landings for a given year cannot be accurately projected. This fishery still appears to be resource limited; however, given the dramatic reduction in ACL and associated the state water quota (62% reduction from 2015 FY) landings could approach the 2017 FY quota.

Marine Fisheries Management Recommendation: Allow effort to increase above current levels and maintain in the non-restricted species category.

ATLANTIC HERRING

Stock Status: The latest stock assessment update, conducted by the Northeast Regional Stock Assessment Workshop in 2015, indicates Atlantic herring are not overfished and overfishing is not occurring. Spawning stock biomass in 2014 is estimated at 623,000 mt, well above the SSB threshold and target of 155,573 mt (342 million pounds) and 311,145 mt (685 million pounds), respectively. Current fishing mortality is estimated at 0.16, below the fishing mortality threshold of 0.24.

Management Program: Atlantic Herring is a jointly managed species by both ASMFC and NOAA Fisheries. Annual specifications are calculated and regional ACLs (quotas) are broken out into fishing areas. Area 2 encompasses Southern New England (SNE) waters including RI state waters. The 2017 Atlantic Herring quota for area 2 was 31,227 metric tons. River herring bycatch is a concern within the Atlantic herring fishery and also has regional ACLs (catch caps) that are set by fishing area. When the catch cap for river herring is reached in any given area the Atlantic herring fishery closes until the next fishing year. The 2017 area 2 river herring catch cap was set at 130 metric tons.

At the state level, all vessels participating in the state waters Atlantic herring fishery to acquire a permit from Marine Fisheries. In 2017 there were 20 participating vessels.

Vessels must provide contact information in the form of an email address to receive messages warning of aggregations of river herring that should be avoided. RI participates in a river herring avoidance program administered by MADMF that monitors river herring bycatch by observing catch at shore side facilities. Vessel captains indicate where the catch originated from on a grid of the SNE fishing area and the data is used to create charts indicating areas where river herring has been observed in the catch. If any given area has been observed to have greater than 0.6 % river herring bycatch a warning is issued to the fleet to alert them to move on from that area.

Performance of Fishery and Quotas: A state quota does not exist. In 2016 9,538,587 pounds of Atlantic herring was landed in RI worth \$1,525,423.

Marine Fisheries Management Recommendation: Recommend continuing the current permitting program and participation in the MADMF river herring avoidance program.

MENHADEN

Stock Status: The ASMFC Atlantic Menhaden Stock Assessment Subcommittee last assessed the menhaden stock in 2015. The population is not overfished and overfishing is not occurring relative to the new maximum spawning potential (MSP) reference points. Full fishing mortality in 2013 was estimated at $F_{2013}=0.22$, a level that is below both the threshold and target levels, $F_{15\%MSP}=1.26$ and $F_{30\%MSP}=0.38$ respectively (ASMFC, 2015a).

Two additional items being worked on for Atlantic menhaden include a socioeconomic study on the commercial bait and reduction fisheries as well as the development of ecosystem based reference points. The socioeconomic study was released in the summer of 2017 (http://www.asmfc.org/uploads/file/5952c992ASMFC_MenhadenSocioeconomicReport_June2017.pdf). The Biological Ecological Reference Point (BERP) working group has been tasked with developing ecosystem based reference points for Atlantic menhaden and anticipates they will be ready in 2019. Although the BERP will not be completed with this task in time for the finalization of Amendment 3, and amendment that is currently in development that will revisit BRPs and quota allocation, the amendment may provide an option for the board to consider these reference points for management use when they do become available.

Management Program: Menhaden are managed in state waters by the ASMFC under Amendment 2 to the Interstate FMP for Atlantic Menhaden. The Atlantic menhaden management board sets an annual Total Allowable Catch (TAC) for menhaden which is then allocated to the Atlantic coast jurisdictions based on landings history. The RI menhaden allocation is 0.02% of the overall TAC. Once the RI allocation is met, the landing of menhaden in RI is prohibited, except for non-directed fisheries which have a

bycatch allowance of 6,000 pounds/vessel/day, or 12,000 pounds/vessel/day if two licensed fishermen are on board the vessel. A TAC set-aside of 1% is used each year by states in the New England region for episodic events, or periods of time when large amounts of biomass are present. RI participates in the episodic event set-aside annually which allows RI state waters to re-open to the landing of menhaden until the set-aside is used up or the program ends.

In addition to the ASMFC management of menhaden, Narragansett Bay in its entirety is designated a Menhaden Management Area through RI statute, which provides DEM the ability to manage menhaden through additional management measures afforded only to those areas with management area status. These measures include areas permanently closed to purse seining (The Providence River and Greenwich Bay), a daily possession limit of 120,000 pounds/vessel, net size certification, vessel capacity restrictions, call-in requirements to both Marine Fisheries and the Division of Law Enforcement (DLE), a threshold amount of fish that needs to be present in Narragansett Bay before the commercial bait fishery can begin (2 million pounds), an overall cap on the amount of fish that could be removed from the Bay (50% of the standing stock in the Bay), and a threshold amount of fish that needs to be present for the commercial bait fishery to remain open (1.5 million pounds). Once the biomass drops below 1.5 million pounds, the commercial bait fishery in the Narragansett Bay Management Area closes. Biomass levels in the menhaden Management Area are monitored on a weekly or bi-weekly basis through a contractor spotter pilot who provides Marine Fisheries with school counts and an estimate of pounds in the management area. A depletion model for open systems (Gibson 2007) uses these spotter pilot estimates, commercial bait landings, and biological information to provide an overall estimate of biomass present in the management area. These model derived estimates are what is used to determine if the fishery can open or must close based on the thresholds above.

Performance of Fishery and Quotas: In 2017, RI’s commercial menhaden quota is 78,195 pounds and has been fully harvested. RI also participated in the Episodic event set-aside in 2017 until the program closed. The table below details the events that have occurred for the commercial menhaden fishery in RI thus far in 2017.

RI’s initial commercial menhaden quota for 2018 is 78,195 pounds, the same as 2017, minus any overages that occur. The initial quota allocation for 2018 is subject to change depending on the timeline and outcome of Draft Amendment 3, expected to go to public comment in the Fall of 2017.

Date	Action	Area	Reason
5/14/17	CLOSED* (Landing & Possession)	All State waters	State quota fully harvested
5/21/16	OPEN (Landing & Possession)	All State waters	Biomass Threshold and RI opted into Episodic Event set aside program

7/3/17	CLOSED* (Landing Only)	All State Waters	Episodic Event set aside program ended
7/13/17	CLOSED (Landing & Possession)	All State Waters	Biomass Threshold

* Closed to the landing of menhaden except for non-directed gear types who have a bycatch allowance.

Marine Fisheries Management Recommendation: Maintain effort at or below current levels in 2018 and maintain as a non-restricted species. In the future, if existing latent effort should become active, consider using the existing purse seine endorsement control date to restrict effort, or move menhaden into the restricted finfish category.

MONKFISH

Stock Status: The federal monkfish (*Lophius americanus*) fishery is jointly managed by the NEFMC and MAFMC, with the NEFMC having the administrative lead. The fishery is managed as two stocks, with RI State waters considered part of the Southern Fishery Management Area (SMA) stock.

The National Marine Fisheries Service (NMFS) conducted an operational assessment in 2016 (Richards, 2016), but due to uncertainty of growth rates the SCALE model could not be updated in this assessment. An alternative method to advise catch limits was developed, which calculates the proportional rate of change in smoothed survey indices over the most recent 3 years to revise catch limits. Since the SCALE model could not be updated for the 2016 assessment, updated BRPs and stock status could not be updated. Thus, the most recent BRPs are from the 2013 operational assessment, which showed: fishing mortality (F) was 0.11; updated Fthreshold was 0.37; and the corrected total biomass (B) estimate of 88,806 mt was above both Btarget of 71,667 mt (Bmsy proxy) and the 2013 corrected Bthreshold of 23,204mt (1/2*Btarget). The 2013 BRPs indicated monkfish are not overfished and overfishing is not occurring in the SFMA; however, high levels of uncertainty in the BRPs due to gaps in the input data and a persistent retrospective pattern that underestimates F and overestimates B in each area.

Management Program: The SMA monkfish stock is regulated by the NEFMC through minimum size limits, gear restrictions, and days at sea (DAS) restrictions. In an effort to meet statutory requirements to complement federal FMP, RI has adopted a minimum size limit, daily possession limit, and state quota on monkfish harvested in state waters.

The RI state-water quota is set at 3% of the SMA Total Allowable Landings (TAL) (595,976 lbs whole weight) with a possession limit reduction to 50 lbs tail weight when state-water landings reach 2% of the SMA TAL (397,317 lbs whole weight). In July

2017, management was amended to update the daily possession limit. Current management is as follows:

Min. Size	Season	Possession Limit (lbs/vsl/day)
17"	May 1 – April 30	700 tail/3,027 whole

Performance of Fishery and Quotas: RI state-water landings for the 2016 FY were 260,316 lbs, representing ~66% of the state possession limit reduction threshold (2% SMA TAL) and 44% of the state quota (3% SMA TAL).

Marine Fisheries Management Recommendation: Under the current management program it appears this fishery could withstand a modest increase in effort and still provide for the directed fishery to remain open for the entire fishing year. Maintain in the non-restricted species category.

WINTER FLOUNDER

Stock Status: The 2015 SNE/MA stock assessment update indicates the stock is overfished, but overfishing is not occurring. Spawning stock biomass in 2014 was estimated to be 13.6 million pounds which is 23% of the biomass target (59.4 million pounds). Fishing mortality was estimated to be 0.16 which is 49% of the overfishing threshold. Since 1981, SNE/MA recruitment has been declining, and 2013 is the lowest in the time series which is approximately 4% of the estimated recruitment in 1981 (the highest in the time series). While the 2014 SNE/MA recruitment estimate increased slightly, overall stock productivity continues to decline. The stock did not meet its rebuilding target in 2014, in part due to low recruitment. In 2014, NOAA Fisheries partially implemented Framework Adjustment 50 to revise the rebuilding end date to 2023. Heavy fishing pressure, habitat degradation, and low genetic variability hinder winter flounder recovery.

Management Program: The NEFMC manages the winter flounder resource through the Northeast Multispecies (Groundfish) FMP. Under the NEFMC Framework 50 for groundfish for the 2018 fishing year, harvest of winter flounder is allowed in the federal SNE/MA stock management area, and federally permitted vessels participating in a sector are allowed to fish with no limit until they reach their sector allowable catch limit. Federally permitted vessels in the “common pool” are currently restricted to a possession limit of 2,000 lb/vsl/day, or 4,000 lbs/vsl/trip limit, which is adjustable by the NMFS regional administrator. The SNE/MA management area remains open to common pool vessels until the allowable catch limit is reached.

At the state level, ASMFC manages the inshore winter flounder stocks through Addendum I to Amendment 1 to the interstate FMP, which includes minimum size, daily possession limits, mesh size restrictions, and areas closed to harvest. Current state

regulations including a commercial possession limit of 50 lbs/vsl/day and areas within state waters closed to harvest, including Point Judith Pond, the Harbor of Refuge, Potters Pond, and Narragansett Bay north of the Colregs line, which aim to protect a recovery of the population in these areas due to the SNE closure (Gibson 2010). In order to maintain a stream of commercial landings for biological data collection used in the stock assessment, RI adopted the 50 pound daily possession limit all state waters. Recreational management measures for winter flounder also remain in place in an effort to greatly reduce F, including a minimum size of 12 inches, daily possession limit of 2 fish / person, and season from March 1st through December 31st

Performance of Fishery and Quotas: A state quota has not existed since 2006. In 2016 299,896 pounds of winter flounder was landed in RI worth \$818,165.

Marine Fisheries Management Recommendation: Recommend considering changes in management to allow more liberal commercial possession limit in state waters. Any changes in state waters management would need approval of the ASMFC Winter Flounder Management Board.

LICENSING RECOMMENDATIONS - **NON-RESTRICTED FINFISH ENDORSEMENT**

Division Recommendations: In 2017 1,201 licenses were issued with the ability to harvest non-restricted finfish in state waters (Table 1). Between 2016 and 2017 there was a net gain of 1 license issued for non-restricted finfish (+5 Commercial Fishing Licenses, -12 Multipurpose, +7 Principal Effort Licenses). For the 2018 fishing season, Marine Fisheries recommends maintaining open entry into the non-restricted license endorsement category.

IAC/RI Marine Fisheries Council: This section to be completed and plan finalized upon inclusion of IAC/Council recommendations: IAC meeting tentative date August 10; Hearing tentative date Sept 18-19; Council meeting date Oct. 2.

RI Marine Fisheries Council: The IAC met on August 10, and the Council met on October 2. No recommendations were offered for 2018 for any changes with the *Non-Restricted Finfish endorsement* for 2018.

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TABLES

Table 1. Historical commercial license counts.

License Type	2013	2014	2015	2016	2017
MULTI-PURPOSE LICENSE	829	816	804	802	789
GILLNET ENDORSEMENT	227	221	218	218	214
DOCKSIDE SALE ENDORSEMENT	241	236	236	245	242
MIDWATER/PAIR TRAWL ENDORSEMENT	132	133	137	139	145
PURSE SEINE ENDORSEMENT	134	134	129	136	140
FLOATING FISH TRAP ENDORSEMENT	5	3	5	7	7
PRINCIPAL EFFORT LICENSE	655	615	593	580	586
LOBSTER ENDORSEMENT	30	27	21	20	19
NON-LOBSTER CRUSTACEAN ENDORSEMENT	35	36	33	33	35
QUAHOG ENDORSEMENT	376	347	340	322	321
RESTRICTED FINFISH ENDORSEMENT	262	258	251	252	266
NON-RESTRICTED FINFISH ENDORSEMENT	135	133	130	152	159
SOFTSHELLED CLAM ENDORSEMENT	235	204	194	183	186
WHELK ENDORSEMENT	118	79	62	53	63
DOCKSIDE SALE ENDORSEMENT	13	12	11	13	15
MIDWATER/PAIR TRAWL ENDORSEMENT	8	9	7	10	9
PURSE SEINE ENDORSEMENT	7	6	5	9	9
OTHER SHELLFISH ENDORSEMENT (replaces non-quahog endorsement)	211	186	177	177	173
COMMERICAL FISHING LICENSE	420	404	412	416	429
LOBSTER ENDORSEMENT	15	14	14	12	11
NON-LOBSTER CRUSTACEAN ENDORSEMENT	100	101	95	95	104
QUAHOG ENDORSEMENT	165	181	189	197	217
RESTRICTED FINFISH ENDORSEMENT	0	0	0	0	0
NON-RESTRICTED FINFISH ENDORSEMENT	256	240	243	248	253
SOFTSHELLED CLAM ENDORSEMENT	163	155	148	139	129
WHELK ENDORSMENT	92	75	65	58	56
DOCKSIDE SALE ENDORSEMENT	14	16	16	15	18
MIDWATER/PAIR TRAWL ENDORSEMENT	46	39	39	40	37
PURSE SEINE ENDORSEMENT	40	42	43	41	40
OTHER SHELLFISH ENDORSEMENT (replaces non-quahog endorsement)	160	149	152	142	129
OVER 65 SHELLFISH LICENSE	268	289	309	350	369
STUDENT SHELLFISH LICENSE	48	47	37	48	39

Table 2. Possession limits (pounds), seasons, and quotas established for Rhode Island commercial fisheries in 2017 (through July).

Month/Species	Black Sea Bass	Scup General Category	Striped Bass General Category	Summer Flounder w/out Exemption Certificate	Summer Flounder w/ Exemption Certificate	Tautog
January	750/wk (1/1) 500/wk (1/22)	50,000/day (1/1)	CLOSED (1/1)	200/day (1/1)	200/day (1/1)	CLOSED (1/1)
February	500/wk	50,000/day	CLOSED	200/day	200/day 1,300/bi-wk or 200/day (2/5)	CLOSED
March	500/wk	50,000/day	CLOSED	200/day	1,300/bi-wk or 200/day	CLOSED
April	500/wk 600/wk (4/2) 700/wk (4/16)	50,000/day	CLOSED	200/day	1,300/bi-wk or 200/day	CLOSED 10 fish (4/15)
May	50/day (5/1) (closed Fridays)	10,000/wk	CLOSED 5 fish/day (5/28) (closed Fri. & Sat.)	50/day (5/1) (closed Fri., Sat., Sun.)	50/day (5/1) (closed Fri., Sat., Sun.)	10 fish CLOSED (5/19)
June	50/day CLOSED (6/10) 50/day (6/28) closed Fridays	10,000/wk	5 fish/day (closed Fri. & Sat.)	50/day (closed Fri., Sat., Sun.)	200/wk or 50/day (6/1) (closed Fri., Sat., Sun.)	CLOSED
July	50/day (7/1) (closed Fridays) CLOSED (7/20)	10,000/wk	5 fish/day (closed Fri. & Sat.) CLOSED (7/3) 5 fish/day (7/10) (closed Fri. & Sat.) CLOSED (7/16)	50/day (closed Fri., Sat., Sun.)	200/wk or 50/day (closed Fri., Sat., Sun.) CLOSED (7/30)	CLOSED
Days in Season	320	365	209	365	365	171
Days Closed	SIP	SIP	SIP	SIP	SIP	SIP

Table 2 cont'd. Possession limits (pounds), seasons, and quotas established for Rhode Island commercial fisheries in 2016.

Month/ Species	Black Sea Bass	Scup General Category	Striped Bass General Category	Summer Flounder w/out Exemption Certificate	Summer Flounder w/ Exemption Certificate	Tautog
January	1,000/wk (1/1) 750/wk (1/24)	50,000/day (1/1)	CLOSED (1/1)	200/day (1/1)	200/day (1/1)	CLOSED (1/1)
February	750/wk 500/wk (2/14)	50,000/day	CLOSED	200/day	200/day; 2,500/bi-wk or 200/day (2/7)	CLOSED
March	500/wk	50,000/day	CLOSED	200/day	2,500/bi-wk or 200/day; 3,000/bi-wk or 200/day (3/20)	CLOSED
April	500/wk CLOSED (4/3)	50,000/day	CLOSED	200/day 100/day (4/17)	3,000/bi-wk or 200/day; 1,000/wk or 100/day (4/17)	CLOSED 10 fish (4/15)
May	50/day (5/1) (closed fridays)	10,000/wk (5/1)	CLOSED 5 fish (5/29) (closed fri. & sat.)	50/day (closed fri. & sat.)	50/day (closed fri. & sat.)	10 fish CLOSED (5/9)
June	50/day (5/1) (closed fridays) CLOSED (6/5)	10,000/wk	5 fish (closed fri. & sat.) CLOSED (6/23)	50/day (closed fri. & sat.)	250/wk or 50/day (6/1) (closed fri. & sat.)	CLOSED
July	50/day (7/1) (closed fridays) CLOSED (7/13)	10,000/wk	CLOSED	50/day (closed fri. & sat.)	250/wk or 50/day (closed fri. & sat.)	CLOSED
August	CLOSED	10,000/wk	CLOSED	50/day (closed fri. & sat.)	250/wk or 50/day (closed fri. & sat.)	10 fish (8/1)
September	CLOSED 50/day (9/15) (closed fridays) CLOSED (9/29)	10,000/wk	CLOSED 5 fish (9/8) (closed fri. & sat.) CLOSED (9/25) 5 fish (9/29) (closed fri. & sat.)	50/day 200/day (9/11) 100/day (9/16)	250/wk or 50/day (closed fri. & sat.) 200/day (9/11) 100/day (9/16)	10 fish; CLOSED (9/16)
October	CLOSED	10,000/wk	5 fish (closed fri. & sat.) CLOSED (10/10)	100/day	100/day	CLOSED; 10 fish (10/15); CLOSED (10/26); 10 fish (10/31)
November	50/day (11/1) CLOSED (11/10)	18,000/day (11/1)	CLOSED	100/day	100/day	10 fish; CLOSED (11/3)
December	CLOSED	18,000/day	CLOSED	100/day 200/day (12/11)	100/day 200/day (12/11) 300/day (12/18) 400/day (12/26)	CLOSED
Days in Season	307	365	200	365	365	168
Days Closed	158	0	149	0	0	88

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

DIVISION OF MARINE FISHERIES



2018 Shellfish Sector Management Plan

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INTRODUCTION

This plan is developed pursuant to RI Gen. Law 20-2.1-9(5), which states that the Director of the Department of Environmental Management (DEM) develop conservation and management plans in support of regulations that may restrict the issuance of commercial fishing licenses. Such restrictions were clearly contemplated by the Rhode Island General Assembly as a means to limit fishing effort and to rebuild depleted fishery resources. As articulated in statute, these plans shall focus on fishery resources with the greatest value to the state.

To meet the purposes of the act, the commercial licensing program created four endorsement categories for the commercial shellfish fishery: *Bay quahaug*, *Soft-shell clam*, *Whelk*, and *Shellfish Other*.

Within each endorsement category is an *exit/entry ratio*, or the number of new individual license opportunities provided for each license not renewed. Exit/entry ratios are reviewed annually by the Industry Advisory Committee (IAC) and Rhode Island Marine Fisheries Council, and presented for public comment at a public hearing in accordance with the requirements of the Administrative Procedures Act (RIGL Chapter 42-35) prior to finalization. Sector Management Plans are designed specifically to provide needed resource information to discuss effort control measures such as exit/entry ratios.

In addition to the licensing program, management of shellfish in state waters is accomplished using various measures including gear and harvest restrictions, minimum sizes, seasons, possession limits, and tagging areas. Establishment of Shellfish Management Areas (SMA) provide for additional management measures, including more restrictive possession limits and areas closed to harvest to protect spawning stock. The following SMAs are currently in place: Conimicut Point, Potowomut, High Banks, Bissel Cove/Fox Island, Mill Gut, Bristol Harbor, Kickemuit River, Jenny's Creek, Sakonnet River, Pt. Judith Pond, Potter Pond, Ninigret (Charlestown) Pond, Quonochontaug Pond, Winnapaug Pond, Green Hill Pond, Narrow River, Little Narragansett Bay/Pawcatuck River, Providence/Seekonk Rivers, Warren River, and Town Pond.

This management plan is updated annually in support of the commercial licensing program in accordance with RIGL 20-2.1-9(5).

BAY QUAHAUG

Resource Assessment: Since 1993 DEM has conducted bay quahaug surveys in Narragansett Bay on an annual basis (Ganz et al. 1999) in both fished and unfished (i.e., closed) areas (Figure 1). The sampling consists of towing a small hydraulic dredge (0.36 meter sweep) for a target distance of 30.5 meters (100 ft) at each station. Pressurized water is delivered to the dredge manifold which dislodges shellfish from the substrate. The dredge is designed to retain legal-sized quahaugs (> 25.4mm hinge width). All species retained in the dredge when

hauled are identified and all shellfish are counted and measured. In 2006, the Division evaluated the quahog dredge survey design and suggested a change from randomly sampling 20% of the entire bay in a year to a rotational design that would accommodate additional sampling in each strata. In 2008, the Division started to implement these revisions. In 2012, the annual survey employed a fully reconfigured design to increase sampling in specific strata in a given year, ultimately allowing all strata to be sampled over several years rather than in a single year as previously conducted. In general, the reconfiguration is designed to increase sampling intensity so that the number of samples per strata is sufficient to produce improved estimates of biomass by size class. Based on this survey, stratified mean density of quahaugs in Narragansett Bay has been fairly constant through the duration of the survey, typically around 2-3 quahaugs per square meter. In the 2015-2016 sampling seasons, mean abundances were greatest in the Conditional Areas and West Passage (Table 1). Dredge efficiency by sediment type will be evaluated in 2017 through a collaboration with academia and industry, where side-by-side tows using the dredge, bullrakes, and quadrat sampling on SCUBA will be performed. These results will be used to inform the Division on where the dredge is and isn't fishing effectively as well as provide appropriate calibrations for abundance data.

Performance of Fishery: There are two very distinct peaks in commercial landings of bay quahaugs in Rhode Island since 1946, the first occurred in 1955 followed by a rapid decline until 1974 and then a second peak in 1985 (Figure 2). Landings and catch per unit effort (CPUE) in 2016 decreased compared to 2015 (Figure 3). In 2016, landings were primarily harvested from Conditional Areas A, followed by Conditional B and the East Passage of Narragansett Bay, and consist of littlenecks (70.5%), top-necks (21.4%), chowders (5.5%) and cherrystones (2.6%) (Table 1).

Licensing Activity and Landings: In 2015, the exit/entry ratio for the *Bay quahaug* endorsement was changed from 2:1 to 1:1, believing that the number of active fishermen and corresponding effort is more an industry-based economic issue than a resource management or availability issue. As such, the Division believes that the number of people participating in the fishery is becoming less relevant from a resource management perspective. Improvements in landings data and reporting compliance, continued resource surveys, refinements to tagging areas and management area harvest schedules will all contribute to improved management.

In 2017 1,735 licenses were issued with the ability to harvest Quahaugs in state waters (Table 2). Between 2016 and 2017, 31 restricted Quahaug licenses were not renewed (12 Multipurpose, 9 Principal Effort Licenses, 10 Commercial Fishing Licenses). Under the current exit/entry ratio regulations (1:1) 33 CFL Quahaug endorsements would be issued for 2018.

Division Recommendation for the Bay Quahaug Endorsement: There are no major changes in Quahaug management anticipated in 2018. DFW recommends maintaining effort at current levels by maintaining the 1:1 exit/entry ratio for the Commercial Fishing License (CFL) Quahaug endorsement.

RI Marine Fisheries Council: The IAC met on August 10, and the Council met on October 2. No recommendations were offered for 2018 for any changes with the *Bay Quahaug endorsement* for 2018.

Future Management Considerations: DEM needs to continue to work with industry to ensure a healthy and sustainable quahaug fishery and a licensing system that will maintain the viability of the commercial fishing industry. Improvements in landings data and reporting compliance, continued resource surveys to provide for accurate evaluation of standing stock, refinements to tagging areas and management area harvest schedules will all contribute to improved management.

Of particular interest are improvements in water quality in the upper Narragansett Bay and Providence River as a result of the Narragansett Bay Commission's combined sewer overflow project. Conditional Areas A, B, and the Conimicut Triangle are all experiencing a decreased frequency and duration of rainfall-induced closures, which has recently led to changes in rainfall-closure criteria in Conditional Areas A and B. Due to the high densities of quahaug broodstock in the Providence River and the potential for this area being opened to harvest in the future, area-specific assessment and management plans need be developed and implemented.

To assess how increased and/or future opening of the Providence River and Conditional Areas will influence the quahog population, several pieces of information will be evaluated. Of particular interest, the Division plans to update the quahog stock assessment model in early 2018. The Division will migrate its previous size-structured approach (Gibson 2010) into a more sophisticated modeling framework known as Stock Synthesis (Methot and Wetzel, 2013) in hope of deriving more accurate and informed biological reference points.

SOFT-SHELL CLAMS

Resource Assessment: A dynamic depletion model for open populations based on the work of Restrepo (2001) and Sosa-Cordero (2003) was developed and applied to monthly catch and effort data for the period 2006 to 2011 (Gibson 2012). The preliminary depletion model results suggested that the population declined from 2006 to 2011 with recruitment failing to replace fishery removals (Gibson 2012). Since 2012 the model has not been able to be updated due to a collapse in the fishery and lack of a depletion response (i.e., landings were so low that the model assumed there was no stock remaining to deplete). During the peak of the fishery in 2010 (Table 3) an increase in minimum size, by itself, did not stop overfishing and catch limits needed to be reduced to less than three bushels per day to bring fishing mortality rates into balance with resource productivity (Gibson 2012).

Prior to 2012, surveys and landings revealed that the bulk of the soft-shell clam biomass was located in upper Narragansett Bay, particularly in the Conimicut Point

area. Due to water quality improvements from the Narragansett Bay Commission's combined sewer overflow project, the Conimicut Triangle Conditional Area opened on June 13th, 2010. However, lacking management area status, the twelve bushel daily possession limit and 1½" minimum size resulted in the biomass being depleted to less than 10% of its former abundance (Gibson 2012). As a result, in April of 2011, the Conimicut Point SMA was established with a possession limit of three bushels per day, as well as an increase in minimum size to two inches state-wide.

Performance of Fishery: Commercial landings of soft-shell clams in Rhode Island have fluctuate greatly since the mid 1990's (Figure 4); however, recent years appear to show historically low landings (Figure 5). Landings in 2016 were down 57% from 2015 and represent the lowest levels in recent history (Table 3).

Licensing Activity: In 2017, 1,104 licenses were issued with the ability to harvest Soft Shell Clams in state waters (Table 2). Between 2016 and 2017, 26 Soft Shell Clam licenses were not renewed (12 Multipurpose, 4 Principal Effort Licenses, 10 Commercial Fishing Licenses). Under the current exit/entry ratio regulations (5:1) 6 CFL Soft Shell Clam endorsements would be issued for 2018. There are no major changes in Soft Shell Clam management anticipated in 2018.

Division Recommendation for the Soft-shell Clam Endorsement: DFW recommends maintaining effort at current levels by maintaining the 5:1 exit/entry ratio for the Commercial Fishing License (CFL) Soft Shell Clam endorsement.

Future Management Considerations: Landings of soft-shelled clams continues to decline (Table 3). Although the Division currently doesn't have a soft-shell clam survey, results from work in the coastal ponds combined with anecdotal observations and landings suggest that the stock is severally depleted. Research to better understand mortality sources, including presence or absence of neoplasia (i.e., leukemia-like cancer, see Metzger et al. 2015) could inform future management practices.

RI Marine Fisheries Council: The IAC met on August 10, and the Council met on October 2. No recommendations were offered for 2018 for any changes with the *Soft-shell Clam endorsement* for 2018.

WHELK

Resource Assessment: In 2010, DEM conducted its first comprehensive analytical assessment on whelk resources in Rhode Island (Gibson 2010). This work constituted the first attempt to assess the stock status of the whelk fishery in Rhode Island waters. This initial stock assessment used a biomass dynamic model (BDM) and an overfishing reference point of $F_{msy}=0.33$ was calculated. The BDM clearly showed that whelk abundance is strongly influenced by fishing mortality rate (F). High F rates above the $F_{msy}=0.33$ level result in low biomass; high whelk abundance occurs when the F is less than F_{msy} (Figure 6). Based on the available data at that time, it was concluded that $F_{msy}=0.33$ was an appropriate overfishing reference point and a fishing mortality rate

target equal to 75% of F_{msy} ($F=0.25$) would provide a buffer to the overfishing threshold. Based on this initial stock assessment, F rate was at or below this level, indicating that overfishing was not occurring. Also, biomass was estimated to be near the B_{msy} reference level, so an overfished condition was not likely (Gibson 2010).

The whelk stock BDM assessment was updated to include data through 2016 and resulted in re-estimation of $F_{msy}=0.53$. As in the previous stock assessment, fishing mortality rates above F_{msy} result in low biomass; high whelk abundance occurs when the F is less than F_{msy} . The updated target F rate is 0.39. F has risen since the original assessment and is now estimated to be at or above F_{msy} (Figure 7), so overfishing is likely. Stock biomass is declining but remains above the threshold for overfished status. The fishery seems to have operated in a pulse fishing mode with periodic increases in abundance that attracted fishing effort (Gibson 2010). High fishing mortality rates ensued (1960's, 1980's), the stock declined, effort dissipated, and a biomass recovery followed. Also, in 2012, a comprehensive whelk fishery sampling program was conducted by DEM which may aid in future assessment of the resource.

Performance of Fishery: A commercial fishery for whelks has existed in Rhode Island for many years; however, until September 2009 it was not regulated or the subject of a stock assessment. There are two species commonly landed in RI, the channeled (*Busycotypus canaliculatus*) and knobbed (*Busycon carica*) whelk, with channeled whelk constituting 98% of reported landings. Since 2006, whelk landings by species have been monitored through the SAFIS reporting system, which captures landings from both state and federally permitted fishers. A sharp increase in whelk landings occurred from 2008 to 2009, and landings remained at peak levels through 2012. Since 2012, whelk landings have steadily decreased (Figure 8). Total landings of whelk (all species) in 2016 was 338,914 pounds (live weight), which was a 31% (493,166 live pounds) decrease compared to 2015. In 2016, the total value of the fishery was reported at \$909,068, which was a 29% decrease compared to 2015 (Figure 8). The average whelk landings per fisher show an overall decreasing trend from 2010 onward (30% decrease since 2010). Number of active whelk fishers have decreased annually since 2011 (45% decrease since 2011) (Figure 9). Ex-vessel value of whelks from 2006 to 2009 was steady at about \$1.04 per pound of live product. Price per pound of live product increased annually from 2010 to 2016, averaging \$2.15 for the timeframe and peaking at an average of \$2.68 in 2016 (SAFIS 2017). Effort during 2016 was reported at 2,629 fishing days by 137 individual fishers, a 9% and 15% decrease respectively, compared to 2015 (3,098 fishing days; 151 individual fishers).

Licensing Activity: In 2017, 908 licenses were issued with the ability to harvest whelk in state waters (Table 2). Between 2016 and 2017, there was a net loss of 4 whelk licenses (-12 Multipurpose, +10 Principal Effort Licenses, -2 Commercial Fishing Licenses). Whelk endorsements are not managed under an exit/entry ratio system. Only current license holders with Quahaug or Soft Shell Clam endorsements may acquire a whelk endorsement.

Division Recommendation: DFW recommends maintaining effort at current levels by maintaining the current issuance restrictions on the *Whelk* endorsement.

Future Management Considerations: A minimum size limit may not be sufficient to prevent overfishing. To limit fishing mortality, output control management measures such as quotas, daily possession limits, closed seasons, and a minimum size based upon sexual maturity should be considered. To avoid opportunistic expansions in effort, consideration will need to be given to effort limitation via license/permitting or through output controls such as catch limits and quotas (Gibson 2010). The data analyses resulting from the 2012 sampling program should be considered for future *whelk* fishery management plan strategies.

RI Marine Fisheries Council: The IAC met on August 10, and the Council met on October 2. No recommendations were offered for 2018 for any changes with the *Whelk endorsement* for 2018.

SHELLFISH OTHER ENDORSEMENT

Resource Assessment: The status of the RI oyster stock is currently unassessed, but is considered greatly depressed compared to historic levels. According to local researchers studying oyster populations within Narragansett Bay, the effects of disease, environmental conditions, poor sets of new recruits, and fishing pressure are all responsible for the sharp decline in abundance levels (Oviatt et al. 1998). It is a reasonable assumption that given such high rates of natural mortality, increased fishing pressure would only help facilitate local depletions of the resource. Recently dead oysters (open shells) are visual evidence of the effects of oyster disease. This occurs in both fished and unfished RI waters. Further investigation into the effects of fishing effort is warranted.

Other species of shellfish commercially harvested within Rhode Island waters include oysters, blue mussels, scallops and razor clams. These species are not routinely assessed by DEM, in large part because there is little data available to conduct comprehensive analytical assessments; however, landings data and anecdotal evidence from the commercial fishing industry are useful pieces of information in identifying populations that warrant further research.

Performance of the Fishery: Commercial landings of wild oysters prior to 2011 were extremely low (estimated range: 671 to 36,242 wild oysters per year) and need further investigation to ensure accuracy. Since 2011 landings of wild oysters have ranged from 17,943 oysters in 2011 to a peak of 315,517 oysters in 2013. Landings have decreased since 2013, with 2016 landings totaling during 59,082 oysters. Landings for blue mussels, scallops, and razor clams in 2016 are either zero or can't be disclosed due to confidentiality requirements.

Licensing Activity: In 2017 1,091 licenses were issued with the ability to harvest shellfish other than quahaug, softshell clam, and whelk in state waters (Table 2).

Between 2016 and 2017, there was a net loss of 29 shellfish other licenses (-12 Multipurpose, -4 Principal Effort Licenses, -13 Commercial Fishing Licenses). Shellfish other endorsements are not managed under an exit/entry ratio system. This is an open license category available to the general public during the application period.

Division Recommendation: Maintain status quo.

RI Marine Fisheries Council: The IAC met on August 10, and the Council met on October 2. No recommendations were offered for 2018 for any changes with the *Shellfish Other endorsement* for 2018.

Future Management Considerations: Several oyster restoration and enhancement projects are currently being conducting in RI waters, as well as research investigating factors influencing recruitment or lack thereof, on natural and restored reefs. Until levels of recruitment increase, the stock will likely remain a severally depleted. The Division should consider maintaining current and expanding future enhancement, monitoring, and research along with evaluating possession limits.

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Table 1. 2016 RI commercial quahaug landings by shellfish tagging area (A) and market category, and total 2016 landings by tagging area compared to mean abundances (2015-2016) sampled by the RI DEM Dredge Survey. Totals and means are also presented as percentages.

A

Shellfish Tagging Areas	Count of Quahogs Landed by Market Size					Total (#)	% of Total
	Little Neck	Top Neck	Cherry	Chowder	Unclassified		
RI 1A,M - Conditional Area A, Mill Gut Management Area	12,065,662	3,884,417	398,821	910,433	0	17,259,333	60.38
RI 1B - Conditional Area B	2,421,022	682,145	99,713	114,277	0	3,317,157	11.60
RI 1C - Conditional Area C	21,790	1,953	533	221	0	24,497	0.09
RI 2 - Greenwich Bay	969,450	213,148	42,709	24,520	0	1,249,827	4.37
RI 3A,C,F,H - West Passage Management Areas	30,590	3,155	1,359	300	0	35,404	0.12
RI 3W - West Passage	1,884,722	448,183	184,339	150,284	0	2,667,528	9.33
RI 4A,B - East Passage	1,821,600	738,792	8,179	319,387	0	2,887,958	10.10
RI 5A,K - Mount Hope Bay	28,127	11,976	454	4,970	0	45,527	0.16
RI 5B - Sakonnet River	34,602	26,844	0	17,379	0	78,825	0.28
RI 6B,N,P,Q,W - Coastal Ponds & Block Island	882,839	106,296	7,083	23,065	0	1,019,283	3.57
Grand Total	20,160,404	6,116,909	743,191	1,564,835	0	28,585,338	-

B

Shellfish Tagging Areas	Total Landings		Mean 2015-2016 Abundance	
	(#)	%	(# m ²)	%
RI 1A,M - Conditional Area A, Mill Gut Management Area	17,259,333	60.38	2.33	14.69
RI 1B - Conditional Area B	3,317,157	11.60	2.30	14.49
RI 1C - Conditional Area C	24,497	0.09	4.71	29.74
RI 2 - Greenwich Bay	1,249,827	4.37	0.82	5.16
RI 3A,C,F,H - West Passage Management Areas	35,404	0.12	3.21	20.24
RI 3W - West Passage	2,667,528	9.33	1.27	8.02
RI 4A,B - East Passage	2,887,958	10.10	0.90	5.66
RI 5A,K - Mount Hope Bay	45,527	0.16	0.08	0.49
RI 5B - Sakonnet River	78,825	0.28	0.24	1.51
RI 6B,N,P,Q,W - Coastal Ponds & Block Island	1,019,283	3.57	NA	-

Table 2. Historical commercial license counts.

License Type	2013	2014	2015	2016	2017
<i>MULTI-PURPOSE LICENSE</i>	829	816	804	802	789
<i>GILLNET ENDORSEMENT</i>	227	221	218	218	214
<i>DOCKSIDE SALE ENDORSEMENT</i>	241	236	236	245	242
<i>MIDWATER/PAIR TRAWL ENDORSEMENT</i>	132	133	137	139	145
<i>PURSE SEINE ENDORSEMENT</i>	134	134	129	136	140
<i>FLOATING FISH TRAP ENDORSEMENT</i>	5	3	5	7	7
<i>PRINCIPAL EFFORT LICENSE</i>	655	615	593	580	586
<i>LOBSTER ENDORSEMENT</i>	30	27	21	20	19
<i>NON-LOBSTER CRUSTACEAN ENDORSEMENT</i>	35	36	33	33	35
<i>QUAHOG ENDORSEMENT</i>	376	347	340	322	321
<i>RESTRICTED FINFISH ENDORSEMENT</i>	262	258	251	252	266
<i>NON-RESTRICTED FINFISH ENDORSEMENT</i>	135	133	130	152	159
<i>SOFTSHELLED CLAM ENDORSEMENT</i>	235	204	194	183	186
<i>WHELK ENDORSEMENT</i>	118	79	62	53	63
<i>DOCKSIDE SALE ENDORSEMENT</i>	13	12	11	13	15
<i>MIDWATER/PAIR TRAWL ENDORSEMENT</i>	8	9	7	10	9
<i>PURSE SEINE ENDORSEMENT</i>	7	6	5	9	9
<i>OTHER SHELLFISH ENDORSEMENT (replaces non-quahog endorsement)</i>	211	186	177	177	173
<i>COMMERICAL FISHING LICENSE</i>	420	404	412	416	429
<i>LOBSTER ENDORSEMENT</i>	15	14	14	12	11
<i>NON-LOBSTER CRUSTACEAN ENDORSEMENT</i>	100	101	95	95	104
<i>QUAHOG ENDORSEMENT</i>	165	181	189	197	217
<i>RESTRICTED FINFISH ENDORSEMENT</i>	0	0	0	0	0
<i>NON-RESTRICTED FINFISH ENDORSEMENT</i>	256	240	243	248	253
<i>SOFTSHELLED CLAM ENDORSEMENT</i>	163	155	148	139	129
<i>WHELK ENDORSMENT</i>	92	75	65	58	56
<i>DOCKSIDE SALE ENDORSEMENT</i>	14	16	16	15	18
<i>MIDWATER/PAIR TRAWL ENDORSEMENT</i>	46	39	39	40	37
<i>PURSE SEINE ENDORSEMENT</i>	40	42	43	41	40
<i>OTHER SHELLFISH ENDORSEMENT (replaces non-quahog endorsement)</i>	160	149	152	142	129
<i>OVER 65 SHELLFISH LICENSE</i>	268	289	309	350	369
<i>STUDENT SHELLFISH LICENSE</i>	48	47	37	48	39

Table 3. RI commercial soft-shell clam landings (lbs) for 2008-2015 by shellfish tagging area.

Shellfish Tagging Areas	Landings (count) by year per area									Average Catch (Count) 2016 (% of per Day total by area)	
	2008	2009	2010	2011	2012	2013	2014	2015	2016		
Unknown	8,820	46,169	7,922	183	1,134	410	740	-	-		
RI 1A - CONDITIONAL AREA A	519,762	351,635	138,754	66,576	2,371	999	5,225	586	1,198	33.3	4%
RI 1B,C - CONDITIONAL AREA B & C	-	-	498,901	46,476	192	92	6,255	13,637	885	49.2	3%
RI 2 - Greenwich Bay	5,704	4,182	70	358	286	-	1,073	148	-		-
RI 3 - F,W - Bissel Cove/Fox Island, West Passage	151,825	72,660	36,227	16,745	10,377	14,453	10,024	7,003	3,303	25.8	11%
RI 4 - East Passage	4,856	5,636	2,692	19,400	377	336	3,926	2,551	3,114	33.1	11%
RI 5 A,B,K - Mt Hope Bay, Sakonnet River, Kickemuit	860	1,930	427	394	97	157	231	528	523	34.9	2%
RI 6 - Coastal Ponds	22,333	12,421	13,602	33,619	27,053	29,334	10,420	4,792	3,520	22.7	12%
Total	714,160	494,633	698,595	183,751	41,887	45,781	37,894	29,245	12,543	33.2	43%

Figure 1. Recent sampling locations and survey strata in Narragansett Bay as measured by RI DEM Fish and Wildlife’s hydraulic dredge survey strata (light yellow) in 2015 (red) and 2016 (blue).

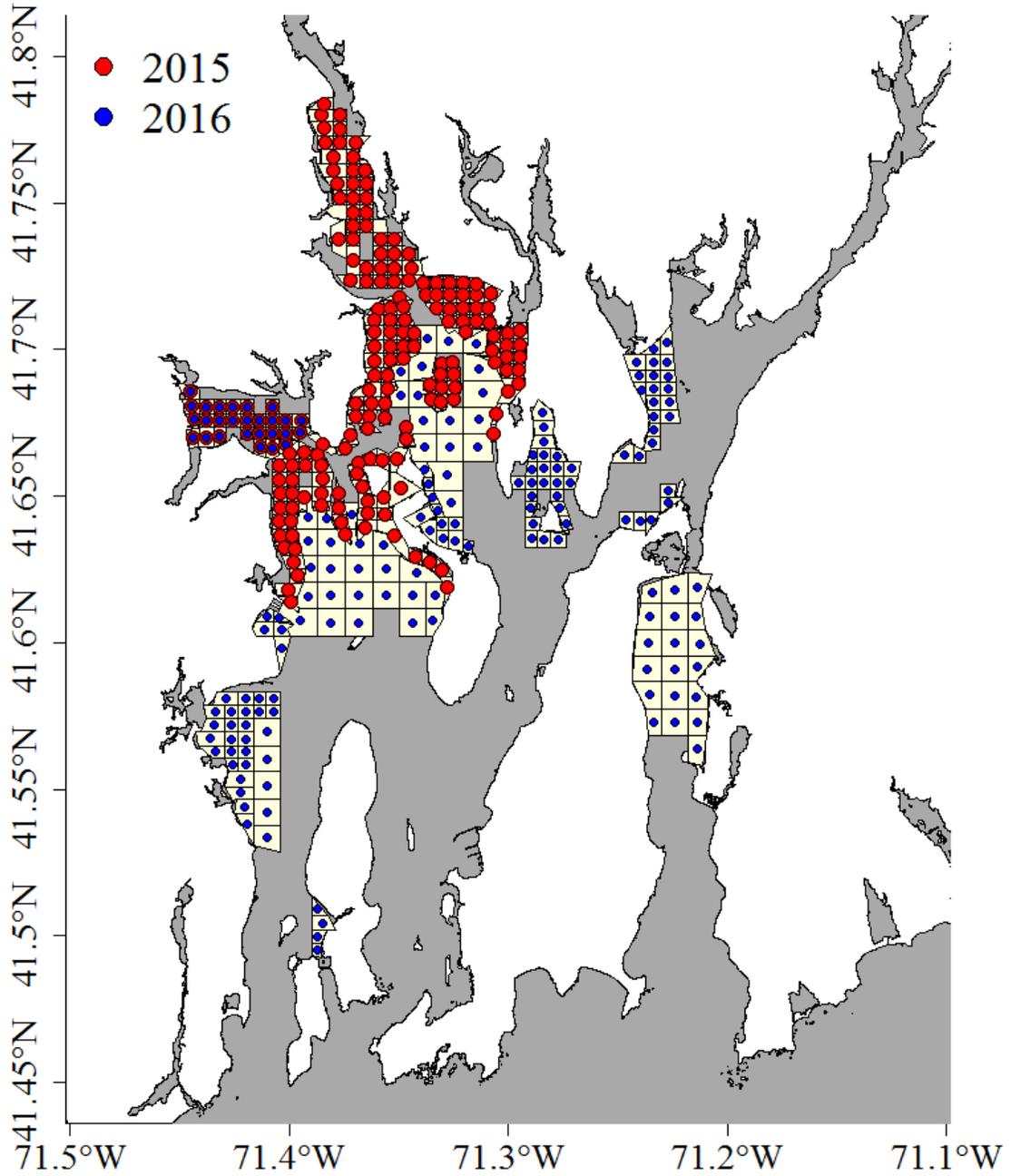


Figure 2. Shell weight (metric tons) of quahaugs commercially landed in Rhode Island from 1946 – 2015.



Figure 3. RI commercial quahaug landings in metric tons of shell weight (black solid line and circles) and catch per unit effort (CPUE; red dashed line) from 2006-2014. CPUE was calculated as metric tons landed per year divided by the total number of SAFIS trips.

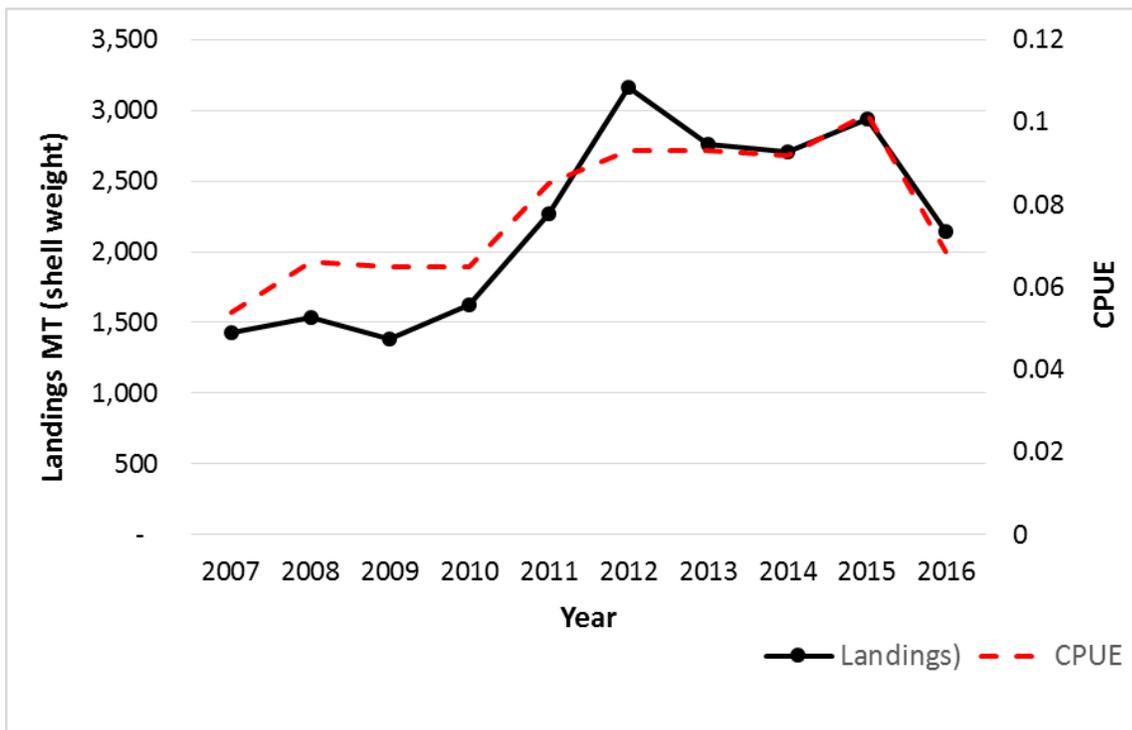


Figure 4. RI commercial soft-shell clam landings (shell weight, metric tons) from 1945-2016.

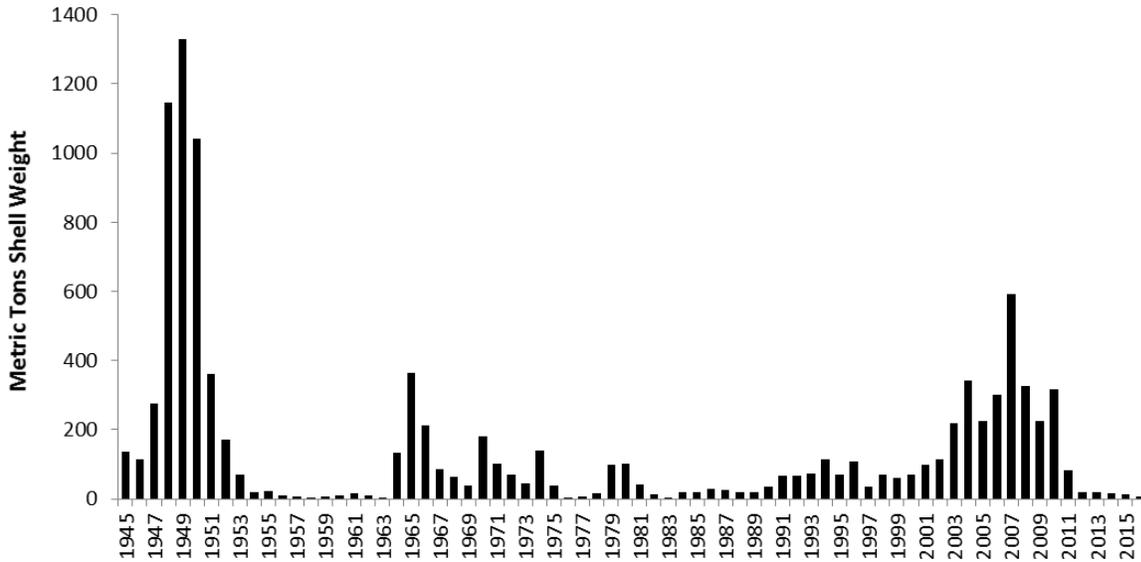


Figure 5. RI commercial soft-shell clam landings (black solid line and circles) and catch per unit effort (CPUE; red dashed line) from 2006-2016. CPUE was calculated as pounds landed divided by the total number of SAFIS trips per year.

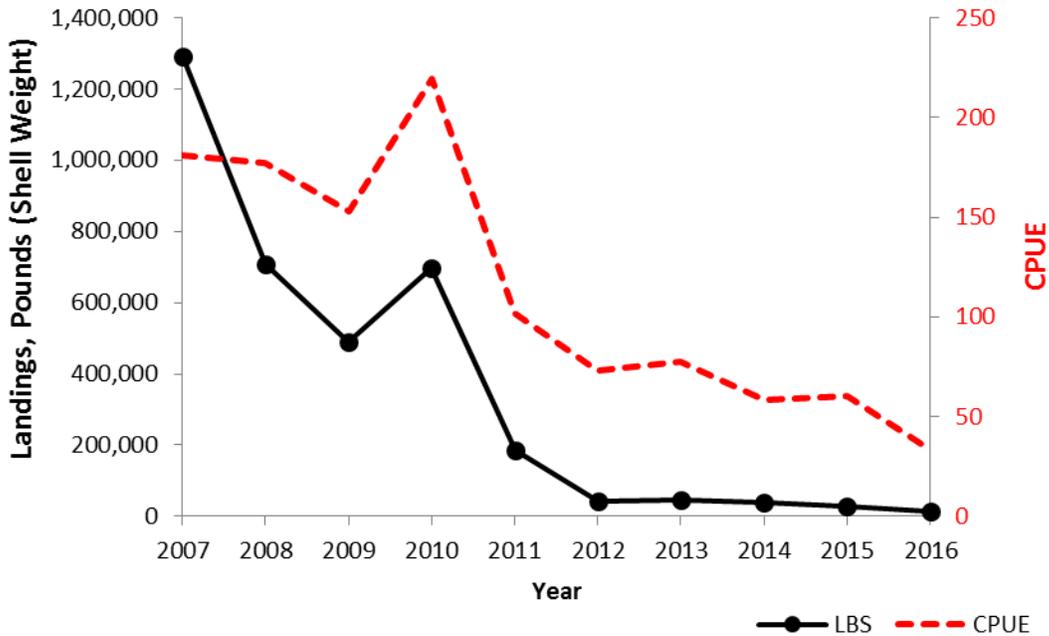


Figure 6. Phase plot for whelk fishing mortality rate (F) and stock biomass.

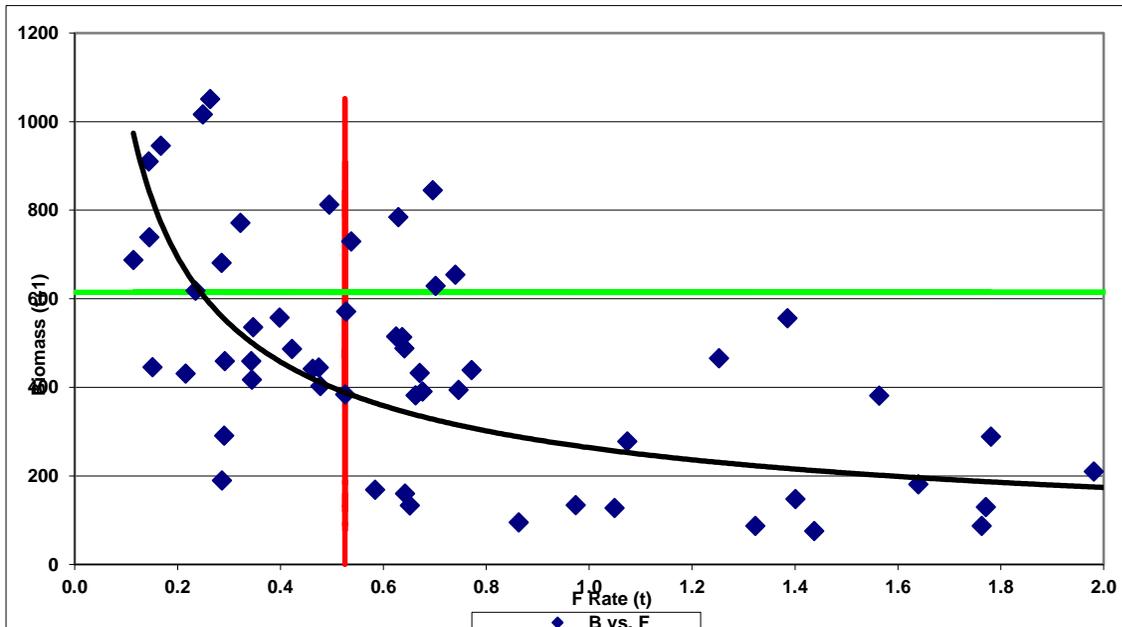


Figure 7. Estimated whelk fishing mortality rate (F) (blue line) compared to Fmsy (redline) and Ftarget (green line).

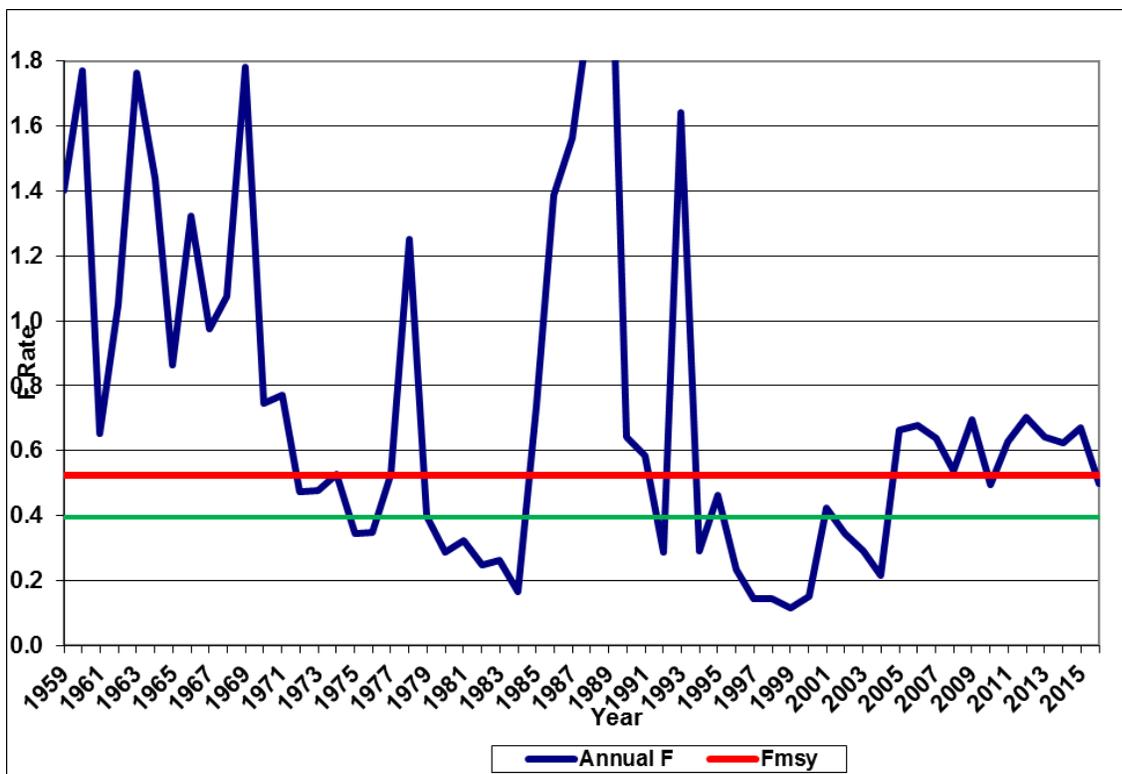


Figure 8. RI commercial whelk landings and value (species combined) for 2006-2016 (SAFIS 2017).

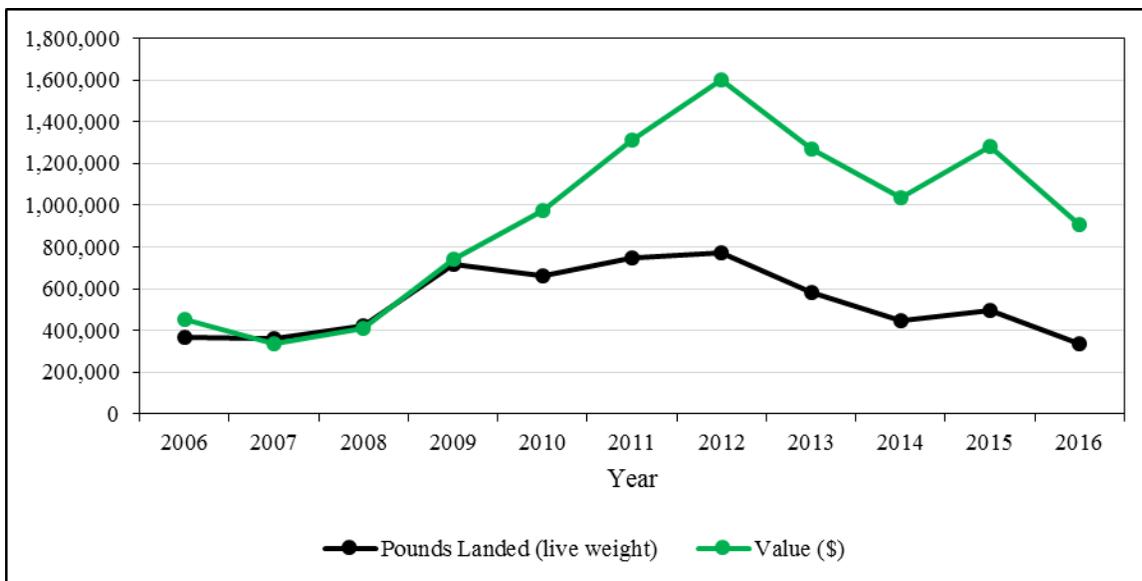
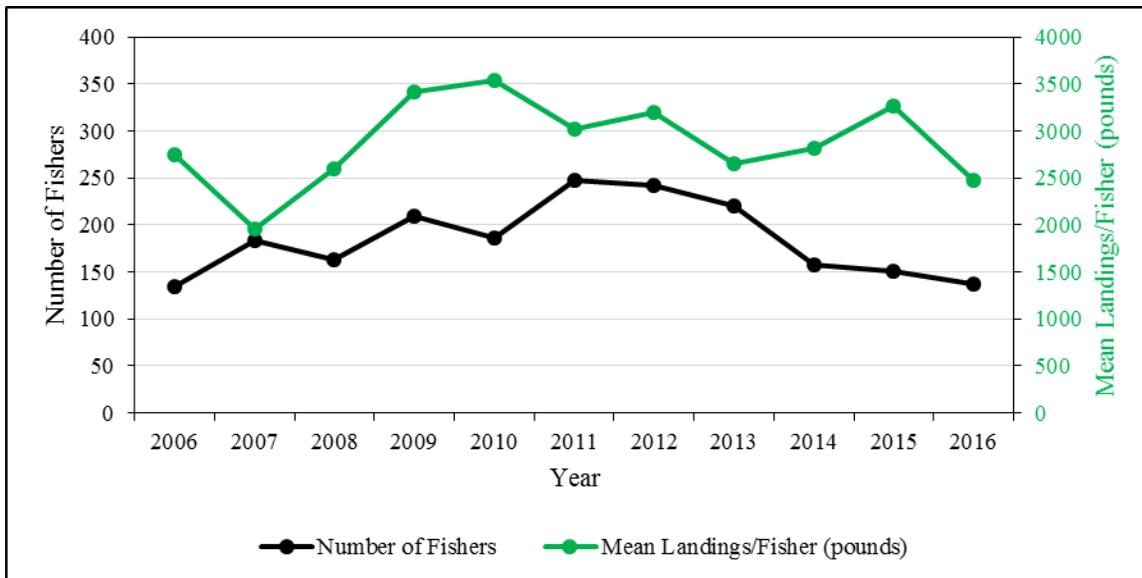


Figure 9. Number of active fishers and mean landings per fisher reported in the RI commercial whelk fishery from 2006-2016 (SAFIS 2017).



Plan approved:

Jason McNamee, Chief
Division of Fish and Wildlife
Office of Marine Resource Management

Date

RHODE ISLAND AND PROVIDENCE PLANTATIONS DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT

DIVISION OF MARINE FISHERIES



2018 Crustacean Sector Management Plan

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INTRODUCTION

This plan is developed and updated annually pursuant to RI Gen. Law 20-2.1-9(5), which states that the Director of the Department of Environmental Management (DEM) develop conservation and management plans in support of regulations that may restrict the issuance of commercial fishing licenses. Such restrictions were clearly contemplated by the Rhode Island General Assembly as a means to limit fishing effort and to rebuild depleted fishery resources. As articulated in statute, these plans shall focus on fishery resources with the greatest value to the state.

To meet the purposes of the act, the licensing program created two licensing endorsement categories for the commercial crustacean fishery: *Lobster* and *Crustaceans Other* (e.g., crab, shrimp).

Within each endorsement category is an *exit/entry ratio*, or the number of new individual license opportunities provided for each license not renewed. Exit/entry ratios are reviewed annually by the Rhode Island Marine Fisheries Council, and presented for public comment at a public hearing in accordance with the requirements of the Administrative Procedures Act (RIGL Chapter 42-35). Determining the level of fishing effort and impacts to the resource that a particular license type collectively represents, and thus determining the number of licenses desired in a given fishery as a means to limit such effort, is a primary goal of the licensing program.

This plan emphasizes American lobster in recognition of their great commercial and recreational value to Rhode Island citizens.

AMERICAN LOBSTER

Stock Status: The lobster resource in Narragansett Bay and Rhode Island coastal waters (Lobster Conservation Management Area 2, Southern New England lobster stock unit) has been deemed exploited over multiple decades (ASMFC 1996, 2000, 2006a, 2009, Gibson 2000). A stock decline in 2002 prompted the Atlantic States Marine Fisheries Commission (ASMFC) to initiate emergency remedial action in LCMA 2, which encompasses Rhode Island state waters. The three ASMFC lobster stock assessments conducted since 2002 have concluded that the southern New England lobster stock (including Area 2) is in poor condition based on the recommended biological reference points, below the abundance threshold, at or near the fishing mortality threshold, depleted and at the overfishing threshold (ASMFC 2006a), and below the effective exploitation threshold (ASMFC 2009, ASMFC 2015) (Table 1).

Agency trawl surveys document the abundance decline that triggered the 2002 ASMFC emergency action in LCMA 2. RI DEM trawl surveys conducted in Narragansett Bay and Rhode Island coastal waters since 1979 show that local lobster abundance dropped from high levels in the mid-1990's to low levels in 2002-2003. Although surveys conducted during 2005-2008 caught slightly more lobster, abundance has not recovered

to former (1990s) levels and remains below the time-series average. URI scientists have observed similar time series patterns in lobster catches conducted by the University of Rhode Island Graduate School of Oceanography (URIGSO) survey in state waters. Both Massachusetts and Connecticut have reported lobster declines to the east in Buzzards Bay and to the west in Long Island Sound. The decline in abundance of both sub-legal and legal lobster from 1997 to 2002 was preceded by a steep decline in the abundance of newly settled lobster from 1990 to 1996. These abundance patterns are consistent with the generally accepted time lag of 6-7 years between first settlement and attainment of legal size. Warming waters, shell disease, oil spills and chemical contaminants, and increasing finfish predation have likely increased the natural mortality rate and reduced the number of lobster surviving from settlement to legal size. The combined effects of reduced settlement and declining early-life survivorship have impacted the fishery, reducing recruitment. RI DEMs ventless trap survey has shown slight increases in sublegal lobster abundance over the last few years, but still below the time series (2006-2016) average. Given the time lag from settler to adult, the increase in legal abundance observed in 2004-2006 was not unexpected. Settler abundance slightly increased from 2013-2015, but decreased in 2016.

The ASMFC lobster technical committee last updated the coast-wide lobster stock assessment, including evaluation of new models that can consider increased natural mortality rate, in 2015. Revisions to their definitions of stock areas and recommendations for new biological reference points were made at that time as well. The ASMFC lobster management board accepted the assessment results and peer review which have since been published for public information (ASMFC 2015). This last assessment showed that the southern New England (SNE) stock of lobster, spanning the region from Cape Cod to New Jersey, is at low abundance and considered severely depleted. The assessment results and peer review comments pertain to a broader stock area than the Rhode Island marine waters.

The ASMFC lobster technical committee recently reexamined various stock status indicators to understand the recent population (2008-2013) in relation to previous years. All abundance (spawning stock biomass, recruitment, YOY) indicators for the SNE stock are close to or below the median abundances for the entire time series, with several below the 25%ile (ASMFC 2015). The SNE stock continues to be below the reference abundance threshold and below the effective exploitation threshold, meaning *the stock is depleted but overfishing is not occurring* (Table 1). Current abundance of the SNE stock is the lowest observed since the 1980s even though exploitation rates have declined since 2000. In general, stock indicators and model results both reflect the same stock status: overall abundance, spawning stock biomass, and recruitment are all at low levels throughout SNE lobster stock; the stock has not rebuilt since the last assessment and is still in poor condition.

In response to the assessment and peer review, the ASMFC lobster management board tasked the ASMFC lobster technical committee to evaluate how changes to different management strategies (e.g. minimum and maximum gauge changes, trap reductions,

closed seasons) may result in increased egg production to increase recruitment under favorable conditions. In May 2017, the ASMFC American Lobster Management board approved moving forward with increasing SNE egg production by 5%. Lobster Conservation Management Teams (LCMT) have provided proposals to reach the 5% based on the suite of tools noted above. The proposals will be reviewed in August, 2017 by the ASMFC Lobster Board.

Management Program: Regional management of the lobster resource is the responsibility of the ASMFC. Amendment 3 to the fishery management plan (ASMFC 1997) and associated addenda govern the interstate management program and peer reviewed coast wide stock assessments (ASMFC 2000, 2006a, 2009, 2014) provide information on lobster biology and resource status. The ASMFC management program is organized by lobster management area (LCMA) with Rhode Island state waters being part of Area 2. DEM complies with the LCMA 2 plan through a set of management measures including minimum/maximum gauge and escape vent sizes, trap limits, protection of egg-bearing females, v-notching, a trap reduction schedule (to be implemented over a 6 year period), and a 10% conservation tax on trap allocation transfers designed to further reduce the number of traps deployed. Both state (RI-MA) and federal waters are included in LCMA 2 making cooperative management essential.

Performance of Fishery: The regional lobster resource has undergone a decline in abundance and fishery performance. The decline has resulted in removal of latent effort in the fishery and reduced landings compared to the 1990s. The number of lobster trap allocations (LTAs) in 2017 did not differ greatly than 2016 across fishing license type (Table 2). Most fishermen holding LTAs are have multipurpose licenses. The trap reduction program continued in 2016-2017, with total traps reduced based on the 5% reduction and the conservation tax (Table 3). Total lobster landings in 2016 were 2.26 million pounds, with an ex-vessel value of over \$12 million.

Division Management and Licensing Recommendations: The state should continue to work with the ASMFC to further reduce fishing mortality and to rebuild the lobster resource throughout the region. Attrition is clearly occurring in the industry, reducing the number of participants and active traps. The state began to neutralize latent effort through the trap reductions imbedded in Addendum XVIII starting in 2016 so that it cannot re-activate if resource conditions improve. Participation in Area 2 is based on historical performance and the state has reviewed lobster licensing and made appropriate changes in preparation for limited access-historical performance. A lobster trap allocation transferability program that was initiated with Addendum XII has been developed in consultation with ASMFC and NOAA Fisheries via Addenda XVIII, XIX, and XXI. This can be used to bring new individuals into the fishery without increasing effort above that qualified in the initial trap allocation.

In view of ASMFC compliance requirements and state law, it is recommended that the moratorium on the issuance of new lobster endorsements be continued for 2018.

RI Marine Fisheries Council: The IAC met on August 10, and the Council met on October 2. No recommendations were offered for 2018 for changes to the current moratorium on the issuance of new lobster endorsements.

HORSESHOE CRAB

Stock Status: An updated coast wide Horseshoe Crab stock assessment was conducted in 2013 showing that the fishing mortality rate is slightly above the F_{msy} reference point and stock abundance has not yet recovered toward B_{msy} . A regional update will be initiated in 2018 at the Commission level.

Management Program: The commercial horseshoe crab fishery is managed at the regional level by the ASMFC Interstate FMP for horseshoe crabs. In state waters, DEM uses time and area closures, possession limits and state established quotas, as well as a permitting/reporting program to achieve compliance with the FMP. For the 2017 fishing year, DEM regulations were adopted establishing broader time closures, improved reporting and reporting compliance measures, a minimum size of 7 inches (prosomal width), and daily possession limits for the bait fishery.

Performance of Fishery: The use of time closures and possession limits in the State's bait fishery has greatly restricted harvest during peak spawning activity and resulted in reduced fishing mortality rates and harvest equity among participants. However, due to a small quota and the nature of accountable commercial harvest, overages may occur annually and must be deducted from the following year possibly resulting in a shorter harvest season and may limit resource access.

Division Management and Licensing Recommendations: . The Division will continue to monitor harvest levels to determine the effects of the management measures and strategy implemented in 2017, however it is too soon to conclude if these measures are effective as intended. Considering the bait fishery has remained open longer than it has in the last 10 years would be an indication of its effectiveness. The Division recommends maintaining as an un-restricted species in the *Other Crustaceans* endorsement category for 2018.

RI Marine Fisheries Council: The IAC met on August 10, and the Council met on October 2. No recommendations were offered for 2018 for any changes with horseshoe crab licensing and permitting requirements.

JONAH CRAB

Stock Status: An ASMFC Fishery Management Plan for the Jonah Crab (*Cancer borealis*) fishery was implemented on June 1, 2016. The management plan ties Jonah Crab harvest to fishers holding a Lobster Trap Allocation (LTA) with elements including permitting, minimum size requirements, and the prohibition of egg bearing females. Additional addenda recently adopted by the ASMFC establishes incidental bycatch

limits for non-trap gear and non-lobster trap gear and limits on claw harvest. Recent *Cancer* crab abundance from the URIGSO trawl survey is below the time-series mean. Currently, there is an endeavor by state, federal, and academic scientists to collect data on Jonah crab life history and population characteristics to perform a formal stock assessment. No time table has been set for such an assessment.

Management Program: Jonah crab is managed at the regional level by the ASMFC FMP for Jonah crab, which was first adopted in 2016 with and includes an (LTA) requirement, a minimum size limit of 4.75 inches and the prohibition of egg bearing females. Additional addenda recently adopted by the ASMFC establishes incidental bycatch limits for non-trap gear and non-lobster trap gear and limits on claw harvest DEM achieves FMP compliance through state regulations adopted in 2016, including minimum size (i.e., 4.75”), minimum escape vent and trap size.

Per Addendum I, a bycatch limit of 1,000 crabs per trip for non-trap and non-lobster fishermen was set. To avoid the unintentional outcome of this addendum of creating small industries operating solely under this provision, the ASMFC Jonah Crab Board aimed to define bycatch. As per ASMFC, Jonah crab caught under the bycatch limit must comprise an amount lower, in pounds, than the target species the deployed gear is targeting. Target species is further defined as: “those species primarily sought by the fishermen in the fishery” and are “the subject of directed fishing effort.” Addendum II, adopted in early 2017 allows Jonah crab fishermen to detach and harvest claws at sea, with a required minimum claw length of 2.75” if the volume of claws landed is greater than five gallons. Claw landings less than five gallons do not have to meet the minimum claw length standard.

Performance of the Fishery: In 2016, over 3.65 million pounds of Jonah Crab were harvested for an ex-vessel value near \$300,000. Due to the infancy of the FMP and state regulations, it is too early to determine the effects of management measures.

Division Management and Licensing Recommendations: In view of ASMFC compliance requirements and state law, it is recommended that RI remains compliant with the ASMFC provisions, and continues its work toward collecting biological and fishery information on Jonah Crab for a future, formal stock assessment. No changes to Jonah crab licensing requirements are recommended for 2018.

OTHER CRUSTACEANS

Stock Status: Commercial landings of crustacean species other than lobster, horseshoe crabs and Jonah crabs include green crabs (*Carcinus maenas*), rock crabs (*Cancer irroratus*), blue crabs (*Callinectes sapidus*), deep-sea red crabs (*Chaceon quinque-dens*), and mantis shrimp (*stomatopoda*). Landings of deep-sea red crabs (*Chaceon quinque-dens*) come strictly from federal waters and participation is limited by federal permit.

Management Program: A control date of June 1, 2016 was established for Atlantic Rock crabs however no other management measures have been adopted or proposed in 2017. Blue crab harvested are subject to a minimum size of 5 inches from shell tip to tip. Harvest is limited to 25 individuals, unless using a scoop or crab net, trot, or hand line.

Performance of the Fishery: A total of 698,985 pounds of these species were landed in RI in 2017 for a total ex-vessel value of \$534,747. Ninety-seven (97) percent of the poundage can be attributed to Atlantic Rock Crab.

Division Management and Licensing Recommendations: Continue to include crustaceans species other than lobster in the *Crustacean Other* endorsement and maintain open entry into this endorsement category.

RI Marine Fisheries Council: The IAC met on August 10, and the Council met on October 2. No recommendations were offered for 2018 for any changes with *Crustaceans Other* endorsement for 2018.

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TABLES

Table 1 - Revised threshold reference points with stock status variables for the Southern New England lobster stock unit.

Variable	SNE
Effective Exploitation	
Effective Exploitation Threshold	0.41
Recent effective exploitation 2011-2013	0.27
Effective Exploitation Below Threshold?	YES
Reference Abundance (number of lobster)	
Abundance Threshold	24,000,000
Recent Abundance 2011-2013	10,000,000
Abundance Above Threshold?	NO

Table 2 - Rhode Island Commercial Fishing License and Lobster License/Endorsement Issuance Data, 2013-2017.

License Type	2013	2014	2015	2016	2017
MULTI-PURPOSE LICENSE	829	816	804	802	789
<i>MPL with Area 2 Lobster Trap Allocation (LTA)</i>	317	308	298	304	304
<i>DOCKSIDE SALE ENDORSEMENT</i>	241	236	236	245	242
PRINCIPAL EFFORT LICENSE	655	615	593	580	586
<i>LOBSTER ENDORSEMENT with LTA</i>	34	29	25	21	19
<i>NON-LOBSTER CRUSTACEAN ENDORSEMENT</i>	35	36	33	33	35
<i>DOCKSIDE SALE ENDORSEMENT</i>	13	12	11	13	15
COMMERICAL FISHING LICENSE	420	404	412	416	429
<i>LOBSTER ENDORSEMENT with LTA</i>	5	3	3	4	4
<i>NON-LOBSTER CRUSTACEAN ENDORSEMENT</i>	100	101	95	95	104
<i>DOCKSIDE SALE ENDORSEMENT</i>	14	16	16	15	18

Table 3. Description of allocated traps, maximum traps fished, and the reduction of traps in 2016. Traps retired include those associated with the reduction program decrease and the conservation transfer tax.

	# of Traps Allocated	# of Traps Transferred	Max # of Traps Fished	# of Traps Retired due to Reductions
Area 2	83259	1748	38815	4562
Area 3	40875	0	28450	2151

