

RHODE ISLAND AND PROVIDENCE PLANTATIONS DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT

DIVISION OF FISH AND WILDLIFE
MARINE FISHERIES



2016 Crustacean Sector Management Plan

Authority: R. I. Gen. Laws Chapter 42-17.1, Section 20-1-4, and Section 20-2.1-9, in accordance with Chapter 42-35 of the Rhode Island General Laws of 1956, as amended.

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INTRODUCTION

Rhode Island general law pertaining to commercial fishing licenses requires 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 licenses (RIGL 20-2.1-9(5)). Restrictions on commercial licenses were clearly contemplated by the Rhode Island General Assembly as a means to limit fishing effort and to rebuild depleted fishery resources (RIGL 20-2.1-2, 20-3.1-2 (4)). Such plans are to be developed with advice from the Rhode Island Marine Fisheries Council (RIMFC) (RIGL 20-2.1-10) and shall focus on fishery resources with the greatest value to the state. The current DEM commercial licensing program recognizes three fishery sectors; crustaceans, finfish, and shellfish. The following is the plan for the crustacean sector with recommendations for licensing in 2016. Two crustacean sector license endorsements, *lobster* and *crustaceans other* (e.g., crab, shrimp) are offered by DEM and are considered here. This plan emphasizes American lobster in recognition of their great commercial and recreational value to Rhode Island citizens.

AMERICAN LOBSTER ENDORSEMENT

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 over exploited for many years (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 Lobster Conservation Management Area 2 (Area 2), which includes Rhode Island state waters. The two 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, is below the abundance threshold, is at or near the fishing mortality threshold, is depleted and at the overfishing threshold (ASMFC 2006a), and is below the effective exploitation threshold (ASMFC 2009) (Table 1).

Agency trawl surveys clearly document the abundance decline that triggered the 2002 ASMFC emergency action in Area 2. Rhode Island Division of Fish and Wildlife (DFW) 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 (Figure 1). Although surveys conducted during 2005-2008 caught slightly more lobster, abundance has not recovered to former levels and remains below the time-series average. URI scientists have observed a similar pattern in lobster catches made by the Graduate School of Oceanography survey in state waters (Figure 2). 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 (Figure 3). These abundance patterns are consistent with the generally accepted time lag of 6-7 years between first settlement and attainment of adult size. In addition to reduced settlement, shell

disease, oil spills, and increasing predation by finfish 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 post-settlement survivorship have impacted the fishery, reducing recruitment, landings and catch per unit effort (CPUE) to lower levels (Figure 4). Given the time lag from settler to adult, the increase in legal abundance observed in 2004-2006 was not unexpected. Although settlement from 2007-2012 was poor, on an optimistic note the 2013-2014 settlement index did increase.

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 2009. 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, at their spring 2009 meeting, accepted the assessment results and peer review which have since been published for public information (ASMFC 2009). 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 depleted (Figure 5). The above cited assessment results and peer review comments pertain to a broader stock area than the Rhode Island marine waters under jurisdiction of the state. In response to the assessment and peer review, the ASMFC lobster management board authorized development of several addenda to the fishery management plan for lobster pending public comment and further board deliberations. An updated lobster stock assessment based on data through 2013 has been completed and results, following a peer review will be released in late 2015 or early 2016.

The ASMFC lobster technical committee recently examined data collected since the 2009 lobster stock assessment (i.e. 2008-2012 data). 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 (Figure 5) even though exploitation rates have declined since 2000. More importantly, the 2009 assessment documented recruitment at very low levels throughout the SNE stock between 1998 and 2005. A number of empirical stock status indicators were examined to judge the stock's overall health independent of assessment model results. Abundance indicators for SNE are generally negative or neutral while fishing mortality indicators are mixed. In the offshore waters covered by the NMFS survey and deeper near shore waters covered by the RI survey, exploitation rates have been neutral or positive for the 2005–2007 time period. However, exploitation for Long Island Sound and the inshore waters of NJ are negative, with the exception of the NJ Fall Survey which is neutral. Fishery performance indicators are generally negative, reflecting the fact that catches and abundance are cascading downward. 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.

Management Program: Lobsters are managed within state waters by the DEM with advice from the RIMFC. 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 with Rhode Island state waters being part of Area 2. DEM complies with the Area 2 plan through a set of management measures that includes minimum gauge and escape vent sizes, trap limits, protection of egg-bearing females, and v-notching. Both state (RI-MA) and federal waters are included in Area 2 making cooperative management essential. The plan for Area 2 initially required reductions in trap deployment in addition to a set of gauge and escape vent size increases in order to rebuild egg production to the minimum F10% level. The Addendum VII plan was structured to include transferability of lobster trap allocation, and includes a 10% conservation tax on trap allocation transfers which is expected to result in further reductions in the amount of traps deployed in Area 2 over time. The transferability provisions for Addendum VII have been developed by ASMFC Addenda XII, XVIII, XIX, and XXI. New interim biological reference points were adopted via ASMFC addendum VIII in 2006 and a rebuilding timeline with technical measures via ASMFC addendum XI were adopted in 2007. These actions were taken to remedy the over-fished condition identified in the 2006 stock assessment. ASMFC addendum XVI established new reference points for determination of lobster stock status and was adopted in November 2009.

Additionally, in response to the April 2010 ASMFC Lobster Technical Committee report on recruitment failure in the SNE lobster stock, the ASMFC Lobster Management Board called for development of an addendum (addendum XVII) to address a recommended 50-75% reduction in the exploitation rate on lobster in the SNE stock. The NMFS contracted the services of the Independent Center of Experts (ICE) to conduct a review of the 2009 stock assessment and technical committee report on recruitment failure in SNE. The ICE review produced a consensus that 1) natural mortality rate (M) had likely increased, 2) the stock was in poor condition, and 3) severe reductions in fishing mortality rate were needed immediately. The ASMFC Lobster Management Board approved Addendum XVII to the Interstate Fishery Management Plan for American Lobster in February 2012. This addendum presents a suite of management options to reduce fishing exploitation on the southern New England (including LCMA 2) lobster stock by 10% starting in July 2013. The proposed 10% reduction would come from changes in the minimum size limit, maximum size limit, and/or closed seasons. Proposals would be developed for each affected lobster conservation management area (LCMAs 2, 3, 4, 5, and 6) to meet the 10% reduction in exploitation. In lieu of a closed season, a conservation equivalency program was approved for LCMA 2 to allow the states of Rhode Island and Massachusetts to implement a mandatory v-notch program for all legal sized egg bearing females beginning June 1, 2012. If the measures do not meet the conservation objectives, an annual four month closed season from January 1 to April 30 will be implemented. As part of the Southern New England area-specific measures, LCMA 3 will implement a minimum size of 3 17/32" effective January 1,

2013. In July 2014 staff biologists analyzed available fishery dependent data and determined that the 10% reduction in exploitation had not been met mostly because of further declines in lobster abundance.

In May 2012 the ASMFC American Lobster Management Board approved Draft Addendum XVIII for Public Hearing. The draft Addendum proposed a consolidation program for LCMA's 2 and 3 to address latent effort and reduce the overall number of traps allocated. The specific management tools being considered include trap allocations, trap banking and controlled growth for participants in the fishery. Addendum XVIII was approved in August 2012 with the goal of scaling the southern New England lobster fishery to the size of the resource, with an initial goal of reducing qualified trap allocation by 25% - 50% over a 5-10 year period of time. Addendum XIX was approved in February 2013 as essentially a revision to Addendum XVIII to change the LCMA 3 transfer tax from 20% down to 10%. Addendum XXI is a continuation and refinement of aspects of Addendum XVIII and addresses mechanisms for reductions in fishing capacity for LCMA's 2 and 3 and rules governing lobster trap allocation transferability. In May 2014 and November 2014, the DEM and NOAA Fisheries respectively, implemented a State licensed and Federally permitted Lobster Trap Reduction and Lobster Trap Transferability program which allows State licensed and Federally permitted fishers to transfer traps within the pool of State licenses and Federal Permits along with a 10% transfer tax to further reduce traps in conjunction with an annual trap reduction schedule for both management areas. The 2016 fishing season will be the first reduction in all Lobster Trap Allocations by 25% in Area 2 and 5% in Area 3.

Current Rhode Island lobstermen fishing in state waters must hold either a multipurpose license, lobster principal effort license, or commercial fishing license endorsed for lobster to fish for lobster, as allowed for by existing state and ASMFC regulations. The licensing statutes require that the Director of DEM specify by rule the status of the lobster resource each year and the availability of new lobster licenses. A limited number of individuals were issued limited access, basic commercial fishing licenses in 2003. These licenses allowed for a 100-pot deployment rather than the 800 pot, full access deployment. As a result of implementation of Addendum VII, all license holders are now limited to fishing a number of traps based on their individual lobster landings and trap deployment history during the years 2001-2003 (or 1999-2000 in cases of a proven medical or military service hardship during the years 2001-2003). No new lobster licenses were recommended or issued by DEM for 2015, and none are recommended by DEM for 2016. Table 2 shows Rhode Island commercial fishing license and lobster license/endorsement issuance data for 2003-2014.

Fishery Management Goals and Objectives:

Goal: The following goal is adapted from the coast wide goal of the Atlantic States Marine Fisheries Commission (ASMFC 1996).

Rhode Island will have a healthy American lobster resource and a fishery management regime, which provides for sustainable harvest, cooperative management by stakeholders, and appropriate opportunities for fishery participation.

Objectives:

1. Maintain fishing mortality rates and brood stock abundance at levels, which minimize the risk of stock depletion and recruitment failure.
2. Extend size-age composition of the resource and increase yield per recruit in the fishery while maintaining harvest at a sustainable level.
3. Maintain existing social and cultural characteristics of the fishery wherever possible
4. Promote economic efficiency in harvesting and use of the resource
5. Provide for adaptive management that is responsive to unanticipated short-term events or circumstances.
6. Increase understanding of American lobster biology and improve data collection, stock assessment models, and relationships between harvesters and scientists.

Future Management Considerations: Industry has worked closely with the ASMFC, NOAA Fisheries, and DFW to implement the effort control program approved by the ASMFC lobster management board. Continued agency/industry cooperation is needed as implementation of transferability and historic participation schemes proceeds throughout the region. These programs, although controversial in some quarters, provide the best long-term mechanism to reduce lobster fishing effort. Industry has also expressed support for a replacement for the North Cape v-notching program that ended in July of 2006. As noted above, this has come in the form of ASMFC Addenda VII, XII, XVIII, XIX, and XXI to the American Lobster FMP. The former program had reduced the fishing mortality rate on female lobsters locally and egg production by v-notched females was a substantial component of egg production during 2002-2006. However, this component of egg production has decreased drastically since the termination of the North Cape v-notching program. Re-institution of this program in the context of achieving ASMFC stock rebuilding targets is set to occur. DEM strengthened v-notch protection by implementing a more restrictive v-notch definition on September 12, 2006. The intent was to increase the longevity of v-notched lobsters and encourage industry to practice voluntary notching. Abundance of v-notched lobsters has declined during 2006-present. This warrants close monitoring since industry based v-notching post North Cape is needed in conjunction with the effort control plan to keep mortality rates low on female lobster. The mandatory v-notch program for all legal sized egg bearing females as part of Addendum XVII to the Interstate Fishery Management Plan for American Lobster is currently still in effect. Finally, industry supports continuation of the un-vented trap survey begun in 2006 as the primary abundance-monitoring tool for lobster. Continued federal funding to Rhode Island is needed to continue this survey.

The state should continue to work with the RIMFC and ASMFC to further reduce fishing mortality and to rebuild the lobster resource throughout the region. Attrition is clearly occurring in the industry and contributing to reduced fishing effort. The state is preparing 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.

It is clear from the above information that the regional lobster resource has undergone a decline in abundance and fishery performance. The decline has imposed substantial economic hardship on industry that has responded with attrition. Recently, the local stock has shown signs of increase but biomass remains below that needed for MSY. The regional rebuilding effort undertaken by the ASMFC has not yet been completed. Additional restrictions may be placed on existing fishers via addendums to the interstate fishery management plan including a continued prohibition on issuance of new Area 2 permits. This prohibition includes state lobster licenses and landing permits applicable to lobster. The finding of reduced resource status (biomass below threshold level) is inconsistent with Rhode Island fishery conservation standard A of RIGL 20-2.1-9.

Division Recommendations: In view of ASMFC compliance requirements and state law, it is recommended that status quo be maintained and the moratorium on the issuance of new lobster licenses be continued for 2016.

RI Marine Fisheries Council: The RIMFC's Industry Advisory Committee (IAC) met on July 21st and voted to maintain status quo. At their meeting on October 5, the Council concurred with the Division and the IAC.

HORSESHOE CRAB

Stock Status: The horseshoe crab (*Limulus polyphemus*), although not a true crab, were found to be over-fished and at low abundance in the first DFW assessment (Gibson and Olszewski 2001) and analysis of data through early 2013 shows a continuing trend of low abundance. An updated coastwide Horseshoe Crab stock assessment was conducted in 2013 and declining abundance was evident in the New England region. These declines were evident in the previous 2004 and 2009 stock assessments, and trends have not reversed. The status of horseshoe crabs in the New England region appears worse than what it was during the 2009 stock assessment, with more indices now likely less than their 1998 reference points.

A commercial quota system with additional seasonal harvest restrictions and possession limits is being proposed to better distribute the annual catch to multiple user groups and gear types. The updated stock assessment shows that the fishing mortality rate is slightly above the F_{msy} reference point and stock abundance has not yet recovered toward B_{msy} (Figures 9 and 10).

Management Program: Horseshoe crabs and are managed in state waters by the DEM with advice from the RIMFC. DEM uses time and area closures, quotas, and possession limits to manage the state waters fishery. Compliance with an ASMFC management plan is required in the case of horseshoe crabs and is achieved with a commercial quota and permitting system.

The spawning period closures have greatly restricted the horseshoe crab fishery and reduced fishing mortality rates. Currently, the Rhode Island Horseshoe Crab assessment is being updated with the most recent data available. Currently there is not an endorsement category specifically for the harvest of horseshoe crabs. This current management approach has proven to be difficult for enforcement and does not allow multiple gear types and user groups an equal opportunity for harvest on a seasonal basis. Additional limits may be needed in the future. New commercial licenses for most of these species need not be limited and can likely sustain harvest levels equal to current licensees. In order for the DFW to react in a timely fashion to fishery landings, the reports should continue to be submitted in the current manner. However it should be noted that with somewhat un-restricted access to the horseshoe crab fishery, the likelihood of an early closure date due to an exhausted quota is high unless more restrictive daily possession limits are implemented. With a quota based management regime, there is no biological reason for limiting access, however as effort increases so do landings.

Division Recommendation: Maintain open entry for the issuance of Horseshoe Crab harvest permits; however the Division feels that this management approach is not providing adequate management of this resource. Creating an endorsement category should be continued to be reviewed as a future management option for the horseshoe crab fishery.

RI Marine Fisheries Council: The Industry Advisory Committee (IAC) of the RIMFC met on July 21st and did not provide a recommendation. At their meeting on October 5, the Council concurred with the Division.

OTHER CRUSTACEANS ENDORSEMENT

Stock Status: The commercial crab fisheries in state waters consists of landings of green (*Carcinus maenas*), Jonah (*Cancer borealis*), rock (*Cancer irroratus*), and blue crabs (*Callinectes sapidus*). Total Rhode Island landings of these species is currently (2014) about 4.5 million pounds and worth about 3.38 million dollars (Atlantic Coastal Cooperative Statistics Program 2014). However, only a small amount of this is taken from state waters. Landings of deep-sea red crabs (*Chaceon quinqueedens*) are also made, but these come strictly from federal waters and participation is limited by federal permit.

An ASMFC Fishery Management Plan is currently under development for the Jonah Crab (*Cancer borealis*) fishery. Probable elements of the management plan could be

but not limited to permitting, minimum size requirements, the prohibition of egg bearing females and incidental bycatch limits. Fishing mortality rate on the two *Cancer* crab species (Jonah and Rock crabs, species combined) has recently exceeded the F_{msy} level (Figure 5). Biomass is below the B_{msy} level so the Jonah and Rock crab resource is considered over-fished at this time. Figure 7 shows the URIGSO trawl survey time-series for the two *Cancer* crab species (Jonah and Rock crabs, species combined). Recent (2006-2014) *Cancer* crab abundance is below the time-series mean.

Figure 8 shows the URIGSO trawl survey time-series for blue crabs.

There is not sufficient data to assess other crab species in state waters at this time. The introduction of the Japanese shore crab (*Hemigrapsus sanguineus*) has been noted and may have as yet unknown consequences for other crab species.

Management Program: Crustaceans other than horseshoe crabs and lobster are managed in state waters by the DEM with advice from the RIMFC. DEM uses time and area closures, quotas, and possession limits to manage the state waters fishery.

Crab abundance is stable or declining so that additional restrictions may be needed. The recent increase in crab landings should be monitored.

Division Recommendation: Maintain open entry into this endorsement category.

RI Marine Fisheries Council: The Industry Advisory Committee (IAC) of the RIMFC met on July 21st and recommended status quo. At their meeting on October 5, the Council concurred with the Division and the IAC.

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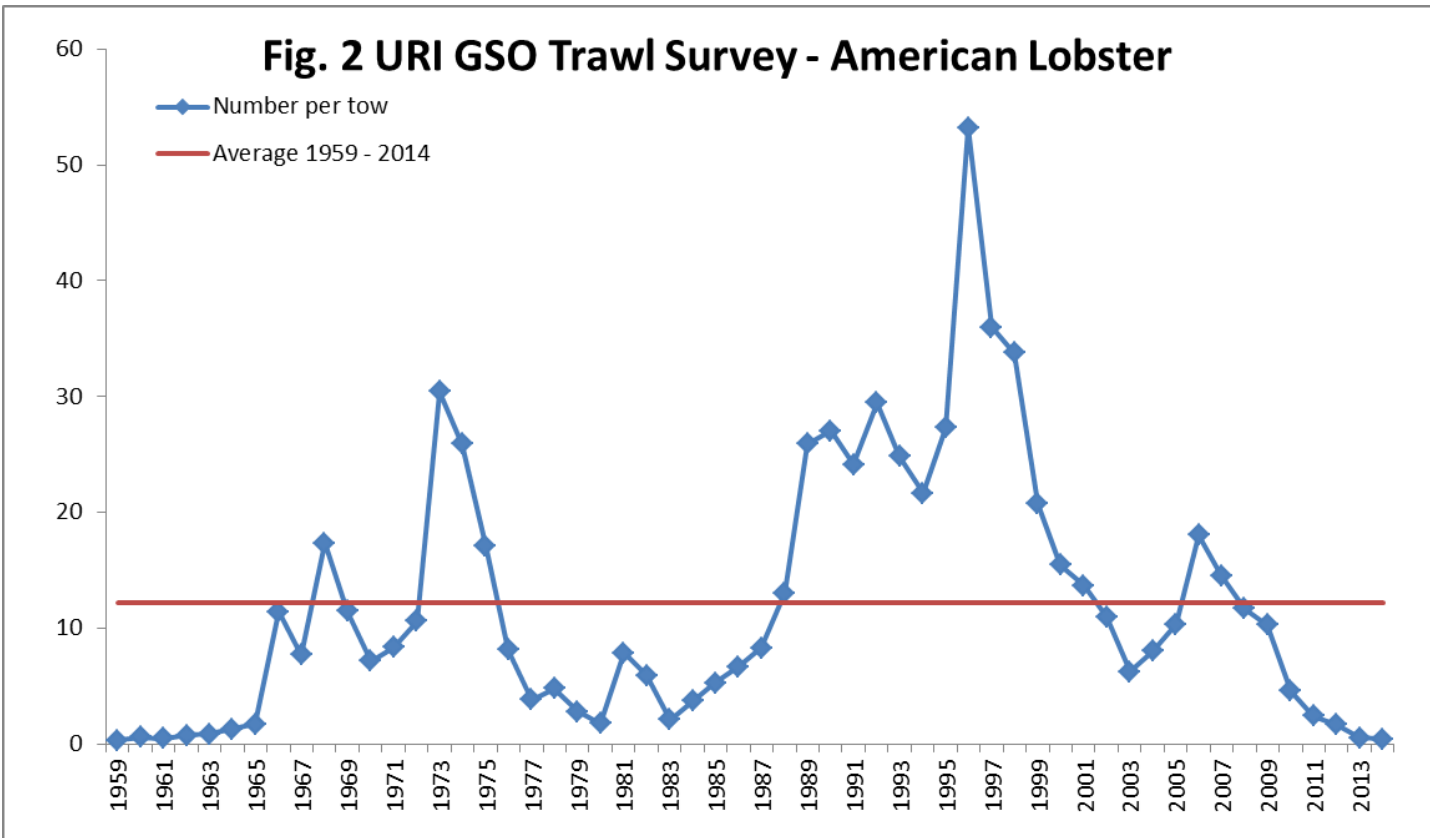
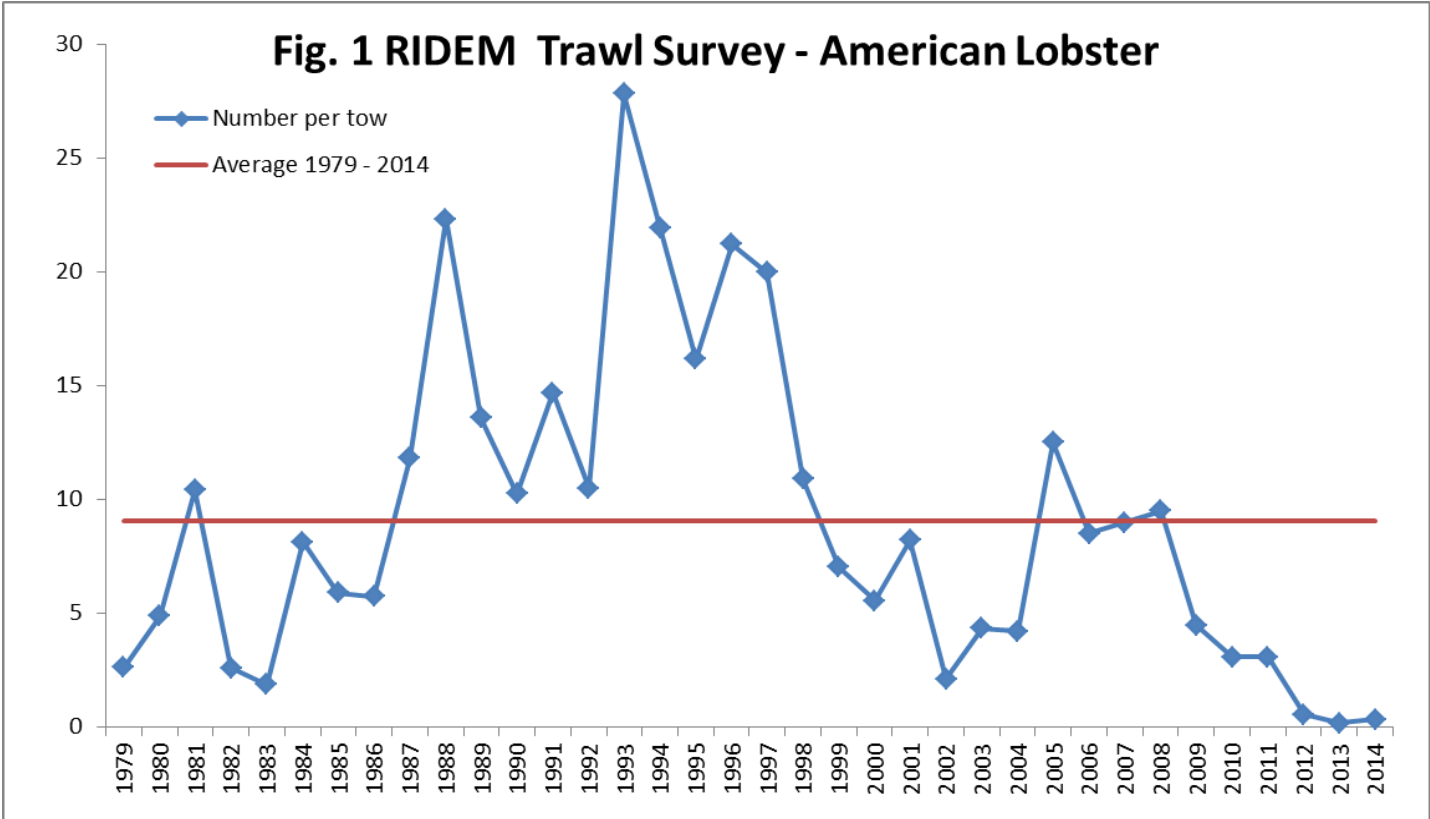
TABLES AND FIGURES

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, 2003-2014.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
License Type													
Total Multi-purpose Licenses MPL	1191	1135	1075	1019	973	939	917	891	868	853	829	816	799
MPL w/lobster endorsement*	1191	1135	1075	1019	973	939	917	891	868	853	829	816	799
MPL ordered trap tags (State only /Area 2)**	265	243	228	207	154	172	148	156	141	108	113	88	86
MPL w/lobster trap allocation (State only/Area 2)*					210	219	215	210	209	209	210	200	196
MPL ordered trap tags (Federal /Area 2)**	130	130	119	108	95	91	87	89	81	78	83	64	63
MPL w/lobster trap allocation (Federal/Area 2)*					112	111	112	110	110	104	107	108	102
Total Principal Effort Licenses PEL	1325	1148	997	930	862	810	776	737	717	690	655	615	590
PEL w/lobster endorsement*	61	56	52	46	45	44	40	38	37	36	30	27	20
PEL ordered trap tags (State only /Area 2)**	25	21	19	18	20	17	17	17	13	10	10	5	6
PEL w/lobster trap allocation (State only/Area 2)*					23	22	22	21	21	21	21	16	15
PEL ordered trap tags (Federal /Area 2)**	16	15	15	10	12	12	13	13	12	7	7	7	5
PEL w/lobster trap allocation (Federal/Area 2)*					14	14	15	15	14	14	13	13	10
Total Commercial Fishing Licenses CFL	271	283	317	397	464	421	433	450	394	398	420	404	404
CFL w/lobster endorsement***	50	48	41	38	32	27	22	19	17	16	15	14	14
CFL ordered trap tags (State only /Area 2)**	24	16	13	10	6	6	6	6	5	4	4	2	2
CFL w/lobster trap allocation (State only/Area 2)***					9	8	8	8	8	8	8	6	6
CFL ordered trap tags (Federal /Area 2)**	0	2	2	2	2	2	1	1	1	1	1	1	1
CFL w/lobster trap allocation (Federal/Area 2)***					2	2	2	1	1	1	1	1	1
Total Effective Lobster Licenses	1302	1239	1168	1103	1050	1010	979	948	922	905	874	857	833
Total Effective lobster Licenses w/trap allocation					370	376	374	365	363	357	360	344	330
* 800 trap limit during 2003-2006; individual history-based lobster trap allocation starting in 2007; all MPL licenses are endorsed to harvest lobster													
** 2003-2013 used trap tag orders as proxy for "effective" lobster licenses													
*** 100 trap limit during 2003-2006; individual history-based lobster trap allocation starting in 2007													



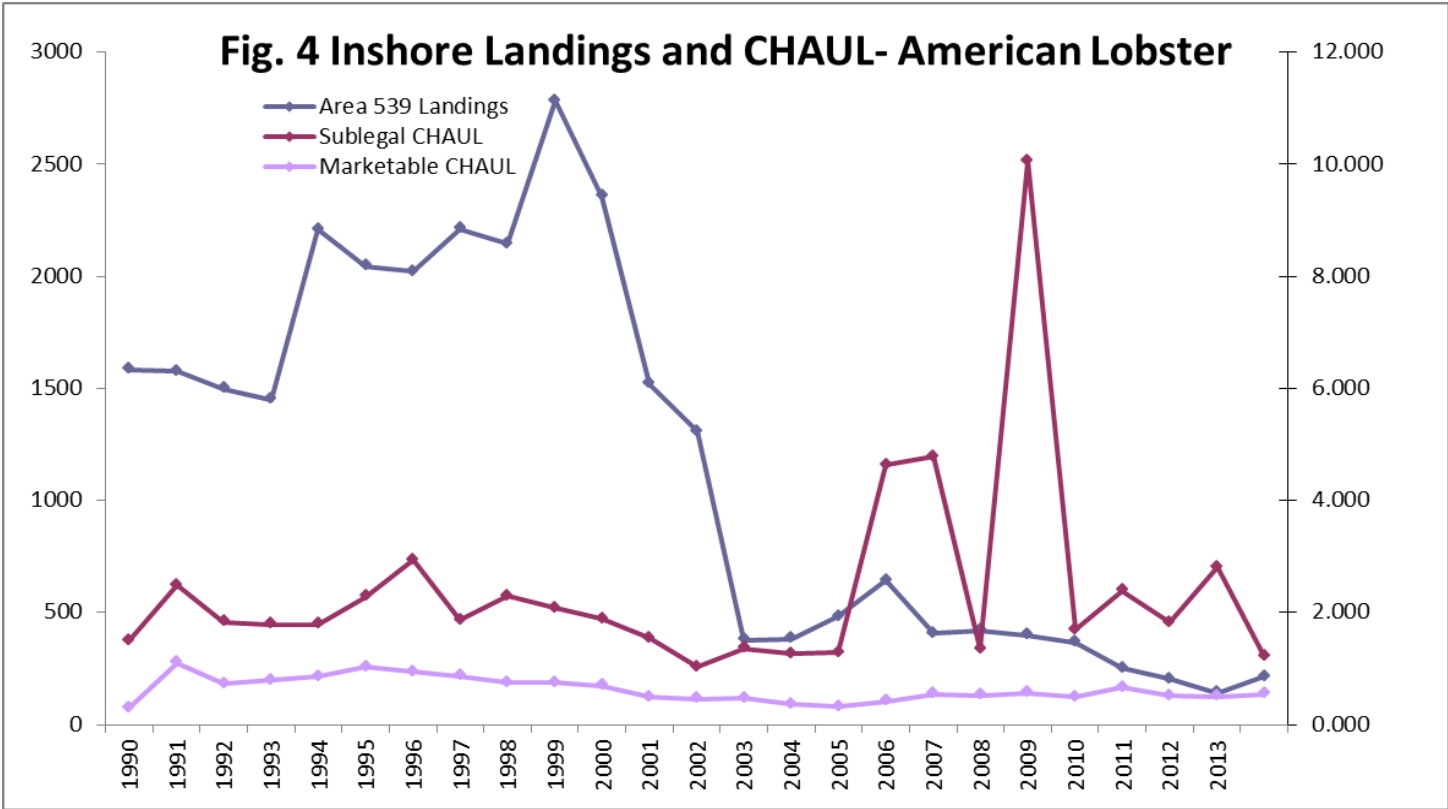
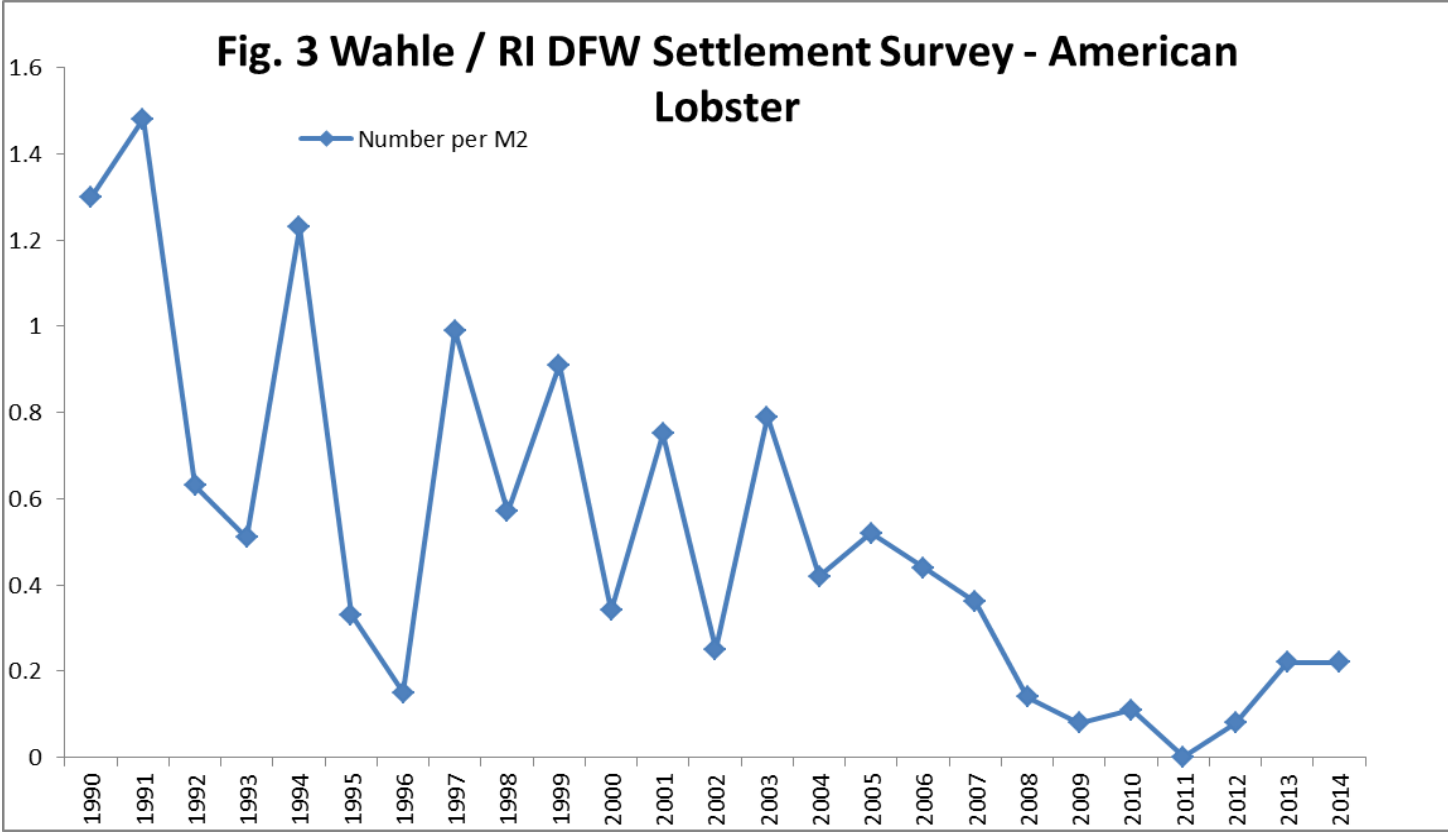


Fig. 5 Cancer Crabs - Exploitation Rate (U)

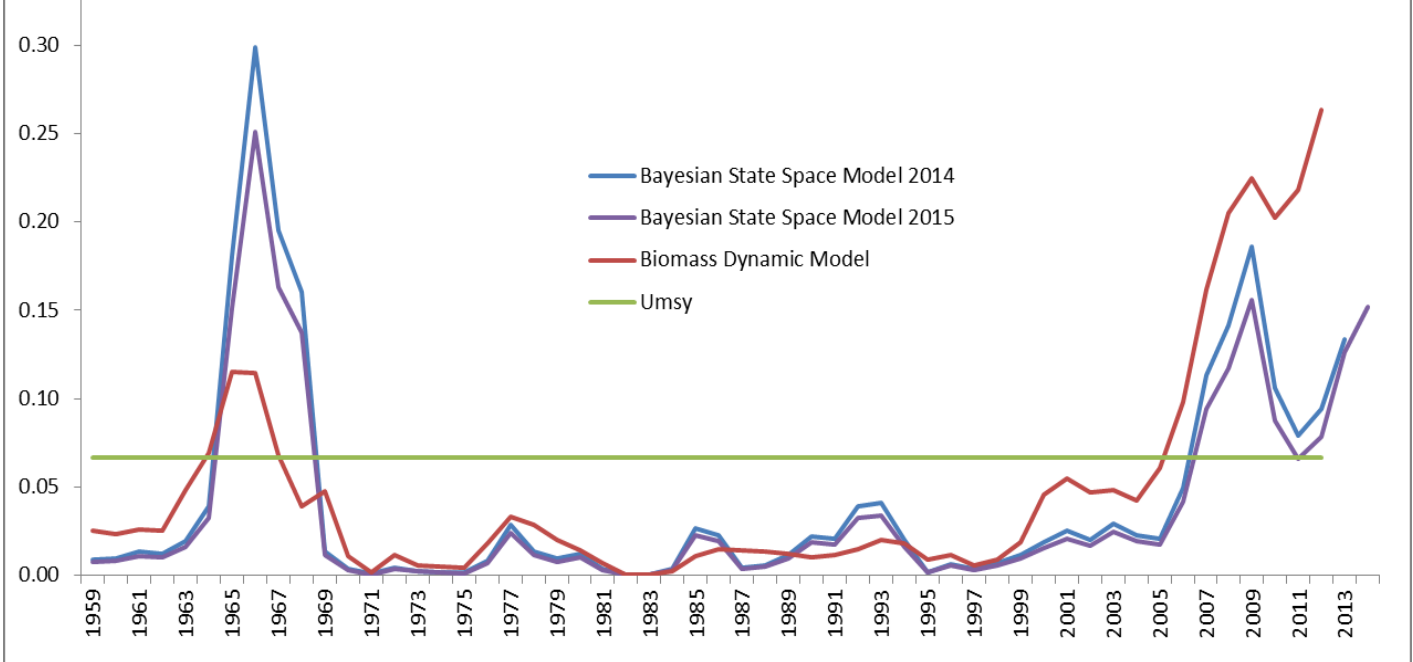


Fig. 6 Cancer Crabs - Biomass

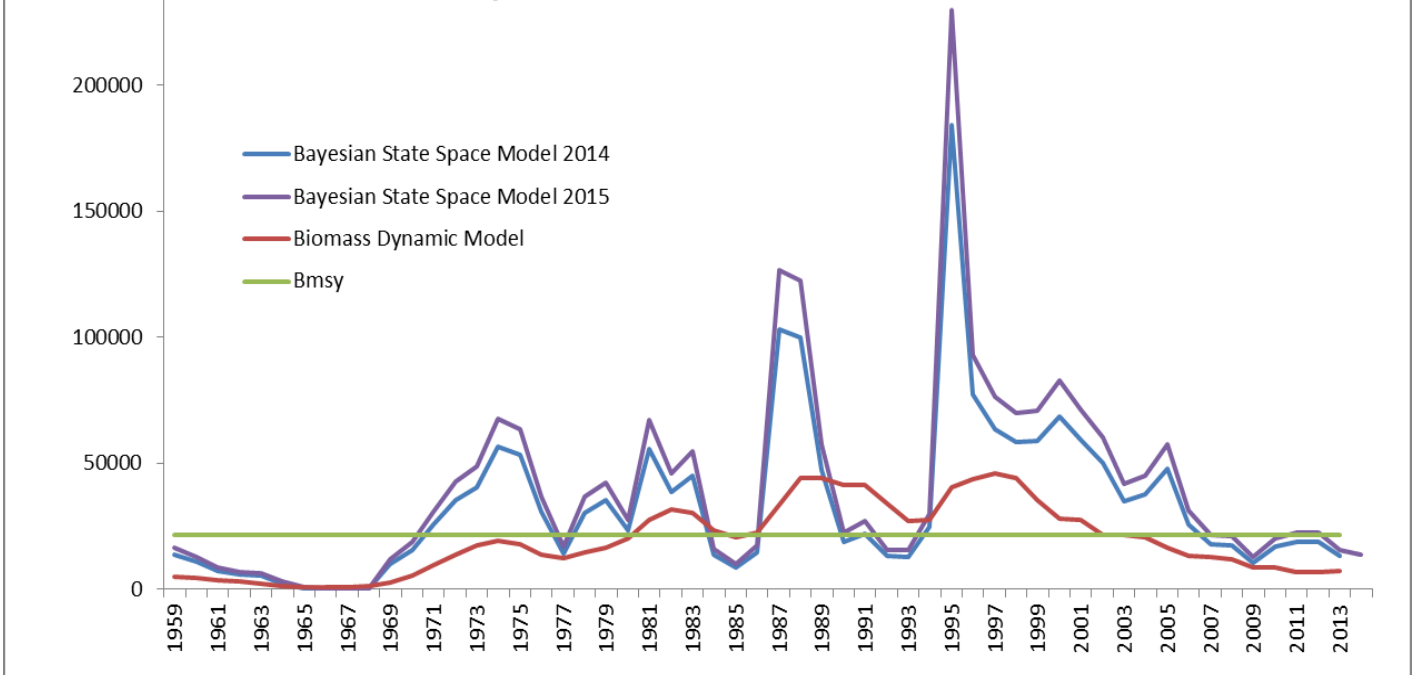
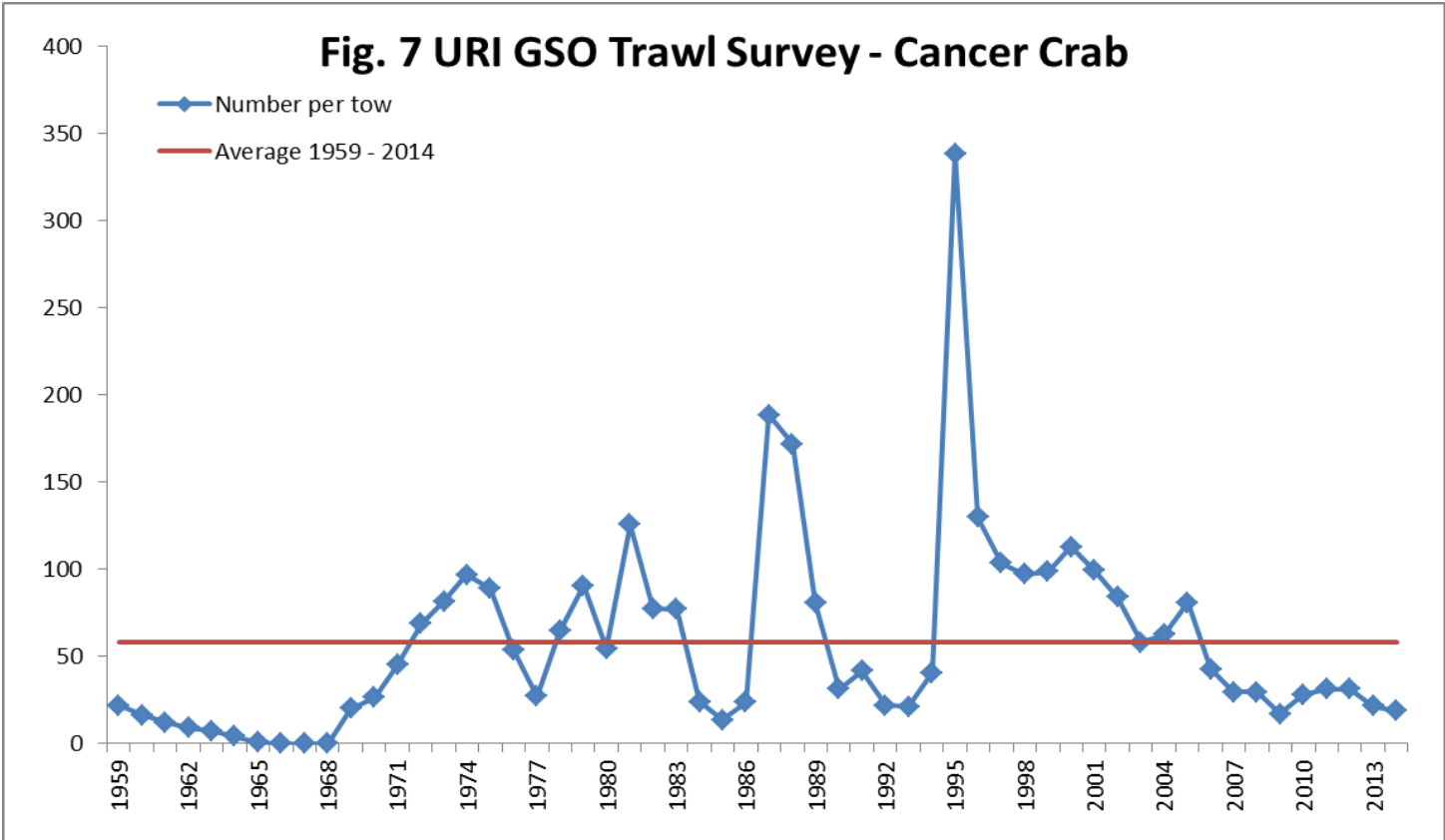


Fig. 7 URI GSO Trawl Survey - Cancer Crab



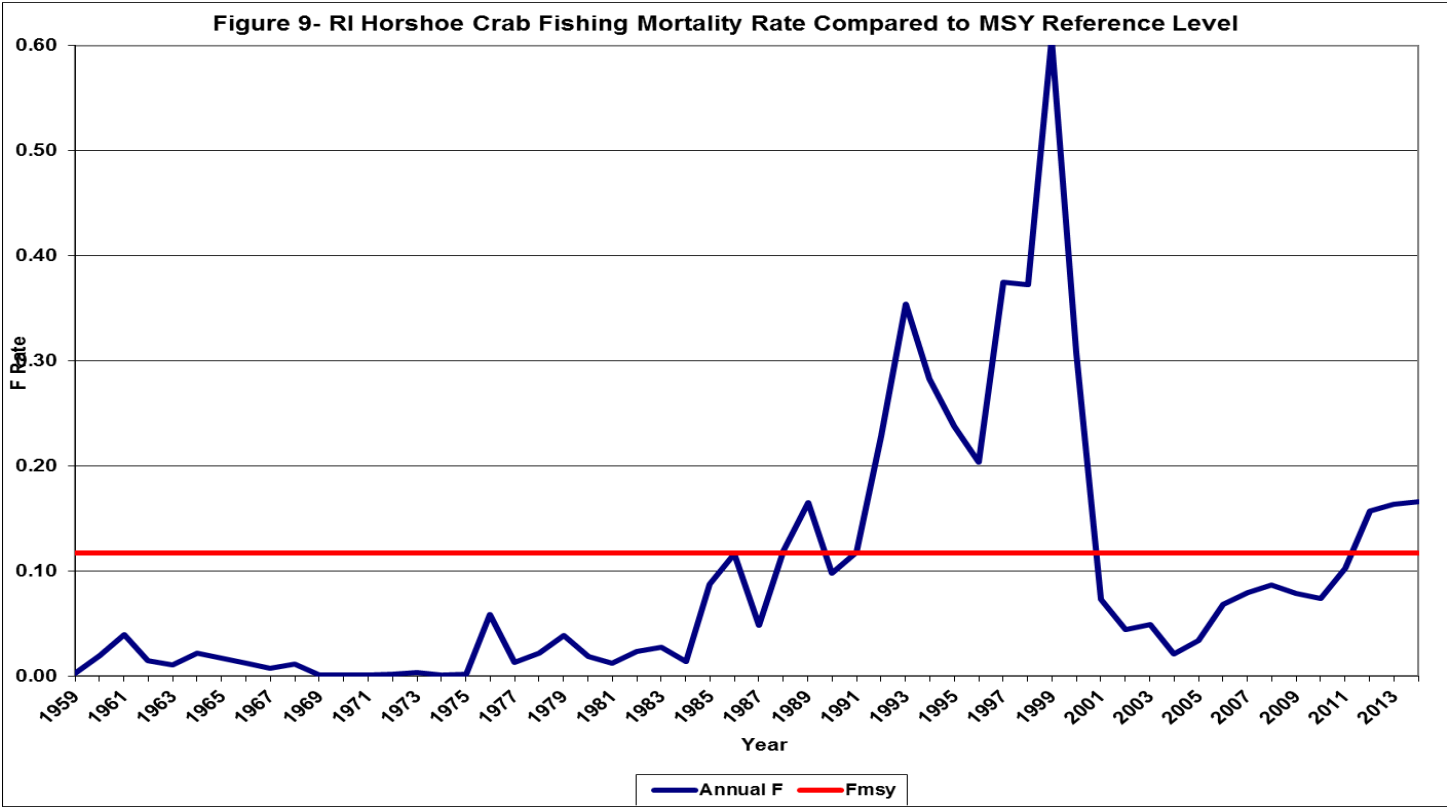
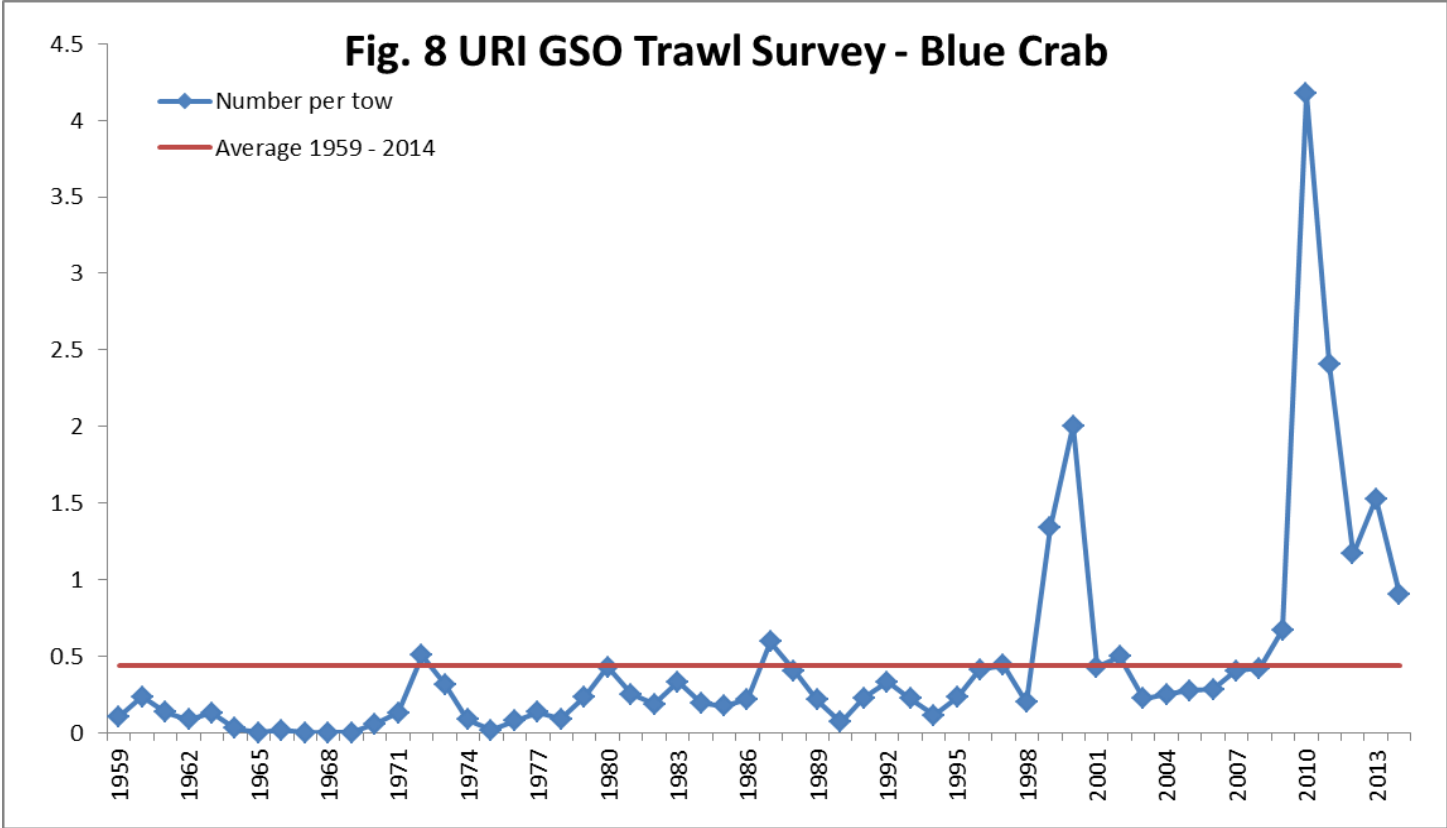
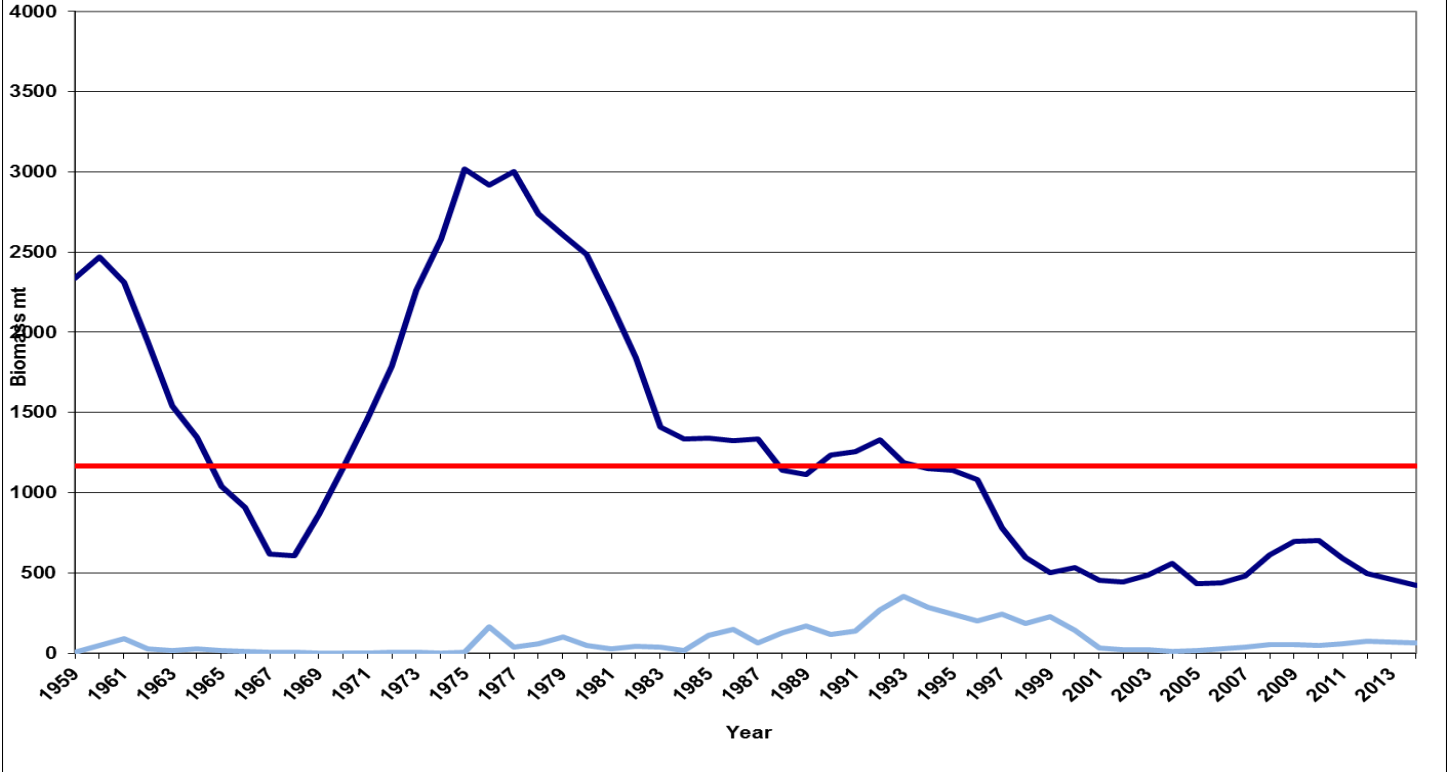


Figure 10- RI Horseshoe Crab Landings and Biomass from the BDM Assessment, 1959-2014



PLAN APPROVED:

 Jason McNamee, Chief
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 Office of Marine Resource Management

 Date