RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PUBLIC NOTICE CONCERNING PROPOSED REGULATORY CHANGES

Pursuant to the provisions of Chapters 42-17.1 and 20-3 of the General Laws of Rhode Island as amended, and in accordance with the Administrative Procedures Act Chapter 42-35 of the General Laws, the Director of the Department of Environmental Management (DEM) proposes amendments to the Rhode Island Marine Fisheries Regulations and gives notice of intent to hold a public hearing to afford interested parties the opportunity for public comment.

Public comment will be solicited on the following proposals:

1) The DEM proposed Management Plans for the Shellfish, Finfish, and Crustacean sectors;
2) Amendments to the commercial fishing licensing regulations, titled "Rules and Regulations Governing the Management of Marine Fisheries", consistent, inter alia, with the proposed Management Plans referenced above;
3) Proposed amendments to the RI Marine Fisheries Regulations – Part III to allow more flexibility to adjust possession limits and seasons in accordance with federal fisheries management plans; and
4) Proposed amendments to the Fish Trap Regulations;

The public hearing will commence at **6:00 PM on Tuesday, October 19, 2010** in the University of Rhode Island, Graduate School of Oceanography, Corless Auditorium, South Ferry Road, Narragansett, RI 02882. The hearing room is handicap accessible. A recording of the hearing will be made and the DEM will provide interpreter services for the hearing impaired, provided such services are requested at least 48 hours prior to the hearing date. A request for this service can be made in writing or by calling (401) 222-6800 or TDD (401) 831-5508. Written comments concerning the regulations proposed for promulgation by the DEM may also be submitted to the Division of Fish and Wildlife, 3 Fort Wetherill Road, Jamestown, RI 02835 no later than 12:00 PM on October 19, 2010.

The Department has determined that small businesses may be adversely impacted by the proposed regulations. The public hearing is being conducted to solicit comment on the proposals and to allow public input from small businesses or any cities or towns, which may be adversely affected. Small businesses which are either currently licensed or in the future may seek permission to harvest, buy, sell, or produce seafood products as well as the small businesses that provide services related to those engaged in such industries and small businesses which buy, sell, or produce products or provide services related to fishing are requested to comment on the proposed regulations on how such proposed action can be changed to minimize the impact on those small businesses affected.

A copy of the proposed regulations will be available for examination from September 16 through October 19, 2010 by mail or at the offices of the Division of Fish and Wildlife located at 3 Fort Wetherill Road, Jamestown, RI 02835. Electronic copies of the proposed regulations will also be available on the DEM website at the following web address: http://www.dem.ri.gov/programs/bnatres/fishwild/pn101910.htm.

W. Michael Sullivan, PhD
Director, Department of Environmental Management

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Division of Fish and Wildlife
Marine Fisheries

2011 Management Plan for the Crustacean Sector

Developed in association with the
Commercial fishing licensing provisions set forth in the
"Rules and Regulations Governing the Management of Marine Fisheries"

August 19, 2010

These rules and regulations are promulgated pursuant to Chapter 42-17.1, Section 20-1-4, Section 20-2.1 and Public Laws Chapter 02-047, in accordance with Chapter 42-35 of the Rhode Island General Laws of 1956, as amended.

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STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

BUREAU OF NATURAL RESOURCES

FISH AND WILDLIFE &
LAW ENFORCEMENT

Rule 1. PURPOSE
The purpose of these rules and regulations is to manage the marine resources of Rhode Island.

Rule 2. AUTHORITY
These rules and regulations are promulgated pursuant to Chapter 42-17.1, Section 20-1-4, Section 20-2.1 and Public Laws Chapter 02-047, in accordance with Chapter 42-35 of the Rhode Island General Laws of 1956, as amended.

Rule 3. ADMINISTRATIVE FINDINGS
Rules and regulations are based upon the need to modify existing regulations (RIGL 20-3-2 through 20-3-6).

Rule 4. APPLICATION
The terms and provisions of these rules and regulations shall be liberally construed to permit the Department to effectuate the purposes of state law, goals, and policies.

Rule 5. DEFINITIONS
See Rhode Island Marine Statutes and Regulations, Part I, '1.3.

Rule 6. SEVERABILITY
If any provision of these Rules and Regulations, or the application thereof to any person or circumstances, is held invalid by a court of competent jurisdiction, the validity of the remainder of the Rules and Regulations shall not be affected thereby.

Rule 7. SUPERSEDED RULES AND REGULATIONS
On the effective date of these rules and regulations, all previous rules and regulations, and any policies regarding the administration and enforcement of this regulation shall be superseded. However, any enforcement action taken by, or application submitted to, the Department prior to the effective date of these Rules and Regulations shall be governed by the Rules and Regulations in effect at the time the enforcement action was taken, or application filed.

Rhode Island Crustacean Fishery Management Plan 2011

Introduction:

Rhode Island general law pertaining to commercial fishing licenses requires that the Director of 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 (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 2011. Two crustacean sector license endorsements, lobster and crustaceans other than lobster (crabs) 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. The 2010 licensing plan recommended no new lobster licenses in view of the poor resource status and ongoing management activities designed to rebuild the lobster resource in the Rhode Island area.

American Lobster:

Stock Status- The lobster resource in Narragansett Bay and Rhode Island coastal waters was 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 remedial action in Lobster Conservation Management Area 2 (Area 2), which includes Rhode Island state waters. An ASMFC subcommittee of lobster biologists and stock assessment scientists was convened to examine the problem and in January of 2003, issued a report that recommended reducing lobster landings in Area 2 by 73% (ASMFC 2003a). In February 2003, the ASMFC adopted an accelerated minimum gauge schedule for Area 2 by emergency action. Further, the board authorized development of Addendum IV to the ASMFC lobster fishery management plan. It was adopted in the fall of 2003 with an implementation date of June 1, 2005. Important elements of Addendum IV included increases in minimum legal size, increases in escape vent dimensions, and an effort control program. The initial effort control plan offered by industry was deemed inadequate and rejected by the ASMFC. Additional guidance to the Area 2 states from the ASMFC on effort control was provided at the August 2004 and May 2005 lobster management board meetings. A key requirement for a revised plan was that trap effort should be capped at or near current levels with the possibility of adjustments pending new stock assessment results. “At or near current level” was clarified to mean within 20-30% of 2003 trap deployments as recorded in industry logbooks. In response, industry and managers developed Addendum VII that employs a history-based effort limitation approach along with provisions that allow for transfers of pots between businesses. Addendum VII was adopted by ASMFC at their November 2005 annual meeting. State regulations to implement Addendum VII were developed and

aired at public hearing on May 15th, 2006. The Rhode Island Marine Fisheries Council (RIMFC), an advisory body to DEM, considered the regulations and public comments at there June 5th, 2006 meeting. They recommended to the Director of DEM that the regulations be adopted. The agency adopted the program in November of 2006.

Agency trawl surveys clearly document the abundance decline that triggered the ASMFC emergency action in Area 2. Rhode Island Division of Fish and Wildlife (RIDFW) 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 recent surveys have caught more lobster, abundance has not recovered to former levels. 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). New settlers descend to the bottom from the plankton each summer having been hatched from eggs carried by females during the preceding year. These abundance patterns are consistent with the generally accepted time lag of 6-7 years between first settlement and attainment of adult size. The available data indicate that declining abundance at the youngest benthic stage began early in the decade before the 1996 North Cape oil spill and the 1997 outbreak of shell disease, reducing recruitment to the adult stock. It is not clear why settlement declined although it was coincident to over-fishing that reduced stock reproductive potential (ASMFC 1996, 2000). A shortage of local egg production is unlikely the cause, as trawl surveys and fishery sampling showed above average abundance of mature-size lobster. Declining settlement was however correlated with a downturn in the North Atlantic Oscillation index (Figure 4). The NAO index measures the difference between barometric pressure in Iceland and the Azores (Drinkwater and Mountain 1997). A positive pressure differential is associated with strong westerly winds across the North Atlantic Ocean, a condition that could facilitate delivery of surface larval lobster from offshore to inshore areas. Katz et al. (1994) showed through analysis of ocean currents and larval swimming behavior that such a subsidy was possible. Climatic and oceanographic control over larval delivery and survival has also been hypothesized by Wahle et al. (2006) based on coherent settlement patterns on spatial scales as large as RI to ME. 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 5). It is worth noting that juvenile settlement improved to average levels in 1997-1999 (Figure 3). Given the time lag from settler to adult, the increase in legal abundance observed in 2004-2006 was not unexpected. On a pessimistic note, settlement from 2007-2009 was poor, suggesting that a return to high stock levels is unlikely in the foreseeable future.

The ASMFC lobster technical committee has updated the coast-wide lobster stock assessment including evaluation of new models that can consider increased natural mortality rate. They have also revised their definitions of stock areas and made recommendations for new biological reference points. National and international stock assessment experts have completed a peer review. 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). The new 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 6). 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.

The ASMFC lobster technical committee recently examined data collected since the 2009 lobster stock assessment (i.e. 2008-2009 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 2). Current abundance of the SNE stock is the lowest observed since the 1980s (Figure 6) even though exploitation rates have declined since 2000. More importantly, the 2009 assessment documented recruitment at very low levels throughout 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 Rhode Island Department of Environmental Management (RIDEM) with advice from the Rhode Island Marine Fisheries Council and RIDFW. 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) provide information on lobster biology and resource status. The ASMFC management program is organized by lobster management area with Rhode Island state waters part of Area 2. RIDEM 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 current 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. New biological reference points were adopted via ASMFC addendum XIII and a rebuilding timeline with technical measures via ASMFC addendum XI in 2007. These actions were taken to remedy the over fished condition identified in the most recent stock assessment.

The RIDFW continues implementation of Addendum VII through the data dispute. The Addendum VII plan is also 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 are currently under development by ASMFC, but have not been implemented at the present time.

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.

Licensing Options and Recommendations-

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 lobster licenses were recommended or issued by RIDEM for 2010, and none are recommended by RIDEM for 2011. Licensing renewal data for 2009 show a similar level of attrition as the fishing effort data given above (Table 1). Between 2003 and 2009, there has been a 25% decline in the number of licenses applicable to lobster.

RI Marine Fishery Council Advice- The Industry Advisory Committee (IAC) of the RIMFC, required under RIGL 20-2.1-11, met in 2009 to formulate advice for the Council on licensing. The IAC offered no specific recommendations for the lobster fishery.

RIDFW Recommendations- 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 in 2010-2011 via addendums to the interstate fishery management plan including a 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. In view of ASMFC compliance requirements and state law, it is recommended that no new lobster licenses be issued for 2011. 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 should strive to neutralize latent effort so that it cannot activate as 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 transferability program is under development in consultation with ASMFC. This can be used to bring new individuals into the fishery without increasing effort above that qualified in the initial trap allocation.

Other Management Considerations-

Industry has worked closely with the ASMFC and RIDFW 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 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-evaluation of this program in the context of achieving ASMFC stock rebuilding targets should 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 lobster declined in 2007 and 2008. This warrants close monitoring since industry based v-notching post North Cape is needed to keep mortality rates low on female lobster. 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.

Other Crustaceans:

Stock Status- The commercial crab fishery in state waters is relatively small with landings of green, Jonah, rock, and blue crabs being made. Total Rhode Island landings of these species is currently about 4.2 million pounds and worth about 2.2 million dollars. However, only a small amount of this is taken from state waters. Landings of deep-sea red crabs are also made but these come strictly from federal waters and participation is limited by federal permit. Fishing mortality rate has recently exceeded the F_{msy} level (Figure 7) and should be monitored in the future. Biomass however was above the B_{msy} level so the Rock and Jonah crab resource is not considered over-fished at this time (Figure 8). 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.

The horseshoe crab, although not a true crab, is also harvested. Horseshoe crabs in Rhode Island were found to be over-fished and at low abundance in the first RIDFW assessment (Gibson and Olszewski 2001). A commercial quota system with additional seasonal harvest restrictions has been instituted and landings have been reduced. An update of the stock assessment shows that while fishing mortality rate has been reduced to below the F_{msy} reference point, stock abundance has not yet recovered toward B_{msy} (Figures 9 and 10).

Management Program- Horseshoe crabs and crustaceans other than lobster are managed in state waters by the Department of Environmental Management with advice from the Rhode Island Marine Fisheries Council. The Department uses seasons, 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.

Fishery Management and Licensing Recommendations- Crab abundance is stable so that no new restrictions are needed. The recent increase in cancer crab landings should be monitored. The spawning period closures have greatly restricted the horseshoe crab fishery and reduced fishing mortality rates. No additional limits are needed at this time.

New commercial licenses for these species need not be limited and can have harvest levels equal to current licensees. The permit to harvest horseshoe crabs could be added as an endorsement through the office of Licensing. In order for the Division 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 un-restricted access to the horseshoe crab fishery, the likelihood of an early closure date due to an exhausted quota is high. With a quota based management regime there is no biological reason for limiting access however as effort increases so do landings.

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Table 1 - Rhode Island Lobster License Issuance Data, 2003-2009

License Type	2003	2004	2005	2006	2007	2008	2009
Total Multi-Purpose Licenses (MPL)	1191	1135	1075	1019	973	939	917
MPL w/ lobster endorsement*	1191	1135	1075	1019	973	939	917
MPL ordered trap tags (State only/Area2)**	265	243	228	207			
MPL ordered trap tags (Federal/Area 2)**	130	130	119	108			
MPL w/ lobster trap allocation (State only/Area2)*					210	219	215
MPL w/ lobster trap allocation (Federal/Area 2)*					112	111	112
Total Principal Effort Licenses (PEL)	1325	1148	997	930	862	810	776
PEL w/ lobster endorsement*	61	56	52	46	45	44	40
PEL ordered trap tags (State only/Area 2)**	25	21	19	18			
PEL ordered trap tags (Federal/Area 2)**	16	15	15	10			
PEL w/ lobster trap allocation (State only/Area 2)*					23	22	22
PEL w/ lobster trap allocation (Federal/Area 2)*					14	14	15
Total Commercial Fishing Licenses (CFL)	271	283	317	397	464	421	433
CFL w/ lobster endorsement***	50	48	41	38	32	27	22
CFL ordered trap tags (State only/Area 2)**	24	16	13	10			
CFL ordered trap tags (Federal/Area 2)**	0	2	2	2			
CFL w/ lobster trap allocation (State only/Area 2)***					9	8	8
CFL w/ lobster trap allocation (Federal/Area 2)***					2	2	2
Total Effective Lobster Licenses	1302	1239	1168	1103	1050	1010	979
Total Effective Lobster Licenses w/ trap allocation	0	0	0	0	370	376	374

* 800 trap limit during 2003-2006; individual history-based lobster trap allocation starting in 2007

** 2003-2006 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

Table 2 – Current Southern New England Stock Unit Reference Points

Variable	SNE
Effective Exploitation (Annual Rate)	
Threshold	0.46
Target	0.41
Recent	0.32
Recent < Threshold	YES
Overfishing Occurring	NO
Reference Abundance (Number of lobster)	
Threshold	20,076,831
Target	25,372,745
Recent	14,676,703
Recent > Threshold	**NO**
Overfished	**YES**

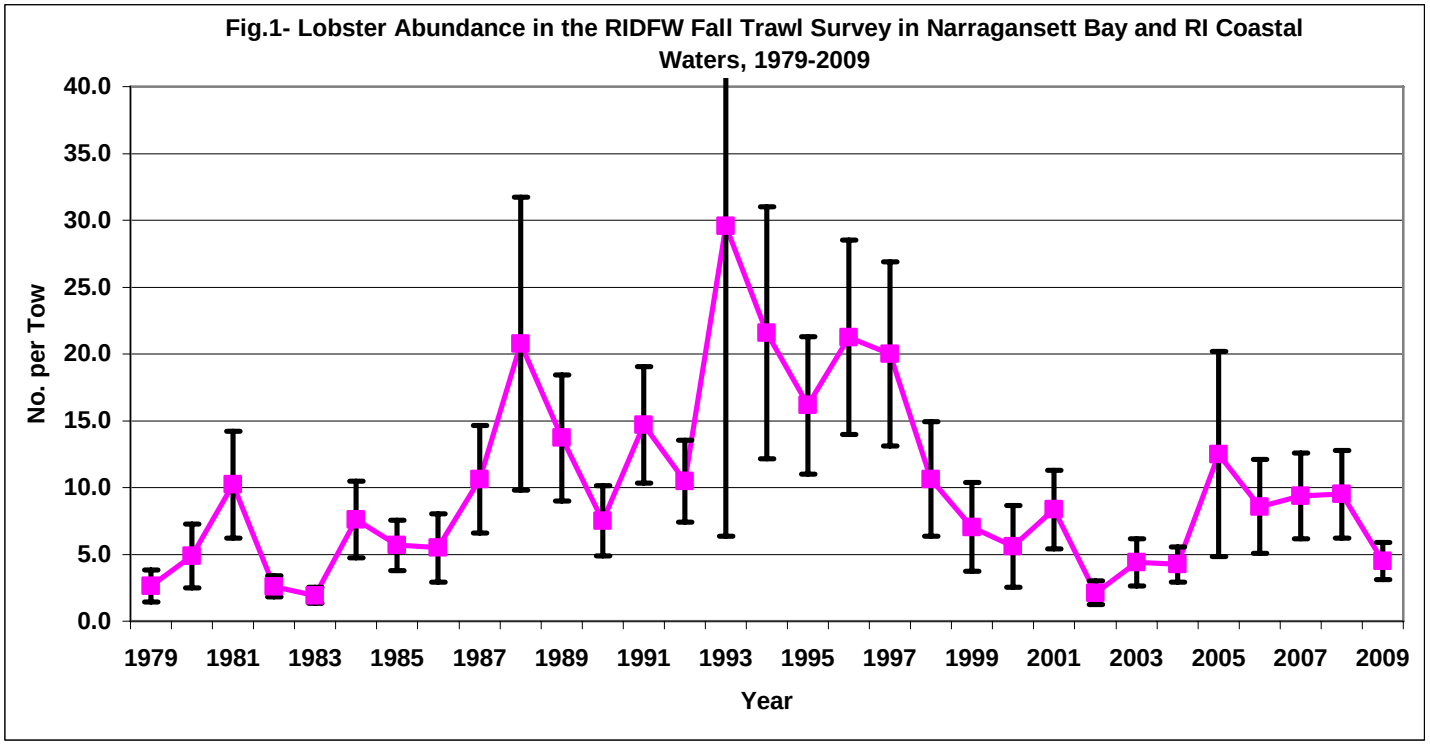
Fig.1- Lobster Abundance in the RIDFW Fall Trawl Survey in Narragansett Bay and RI Coastal Waters, 1979-2009
No. per Tow
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
Year

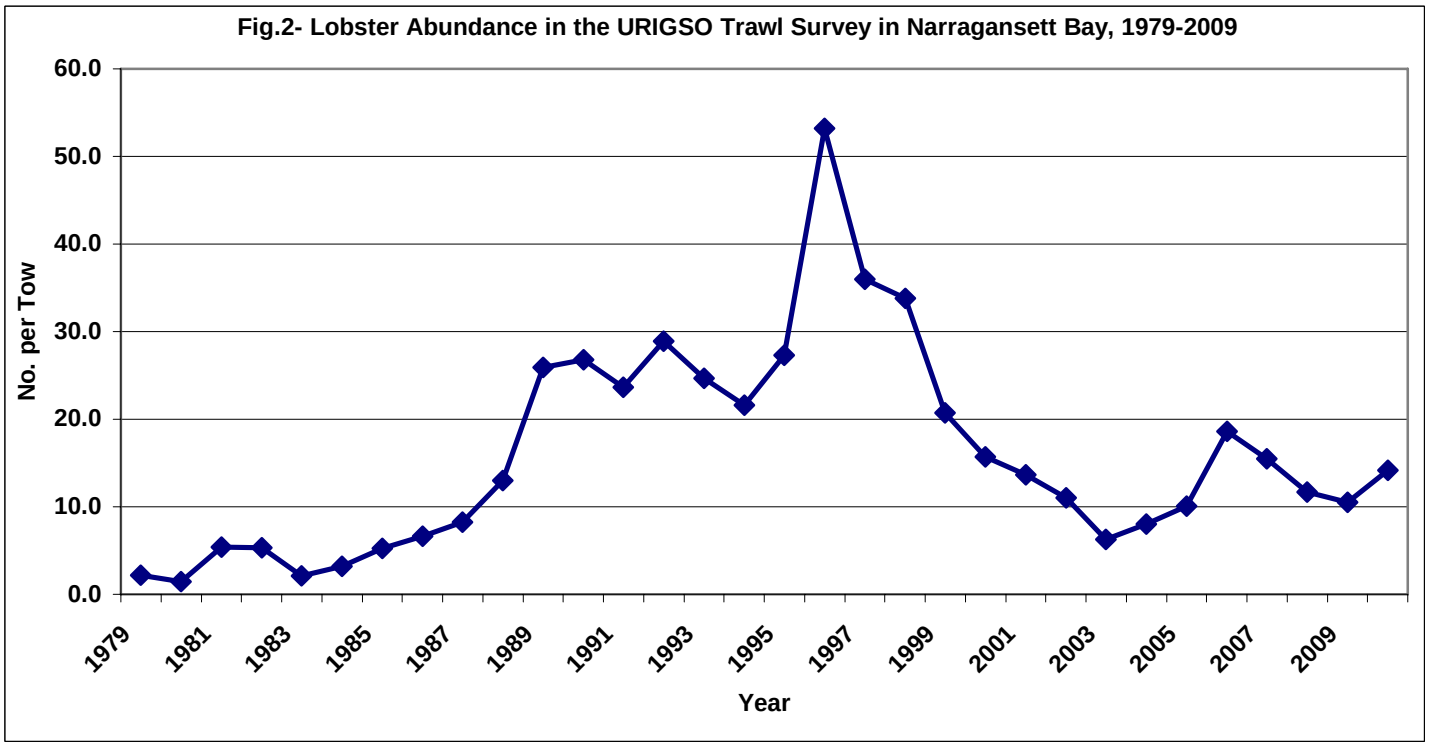
Fig.2- Lobster Abundance in the URIGSO Trawl Survey in Narragansett Bay, 1979-2009
No. per Tow
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
Year

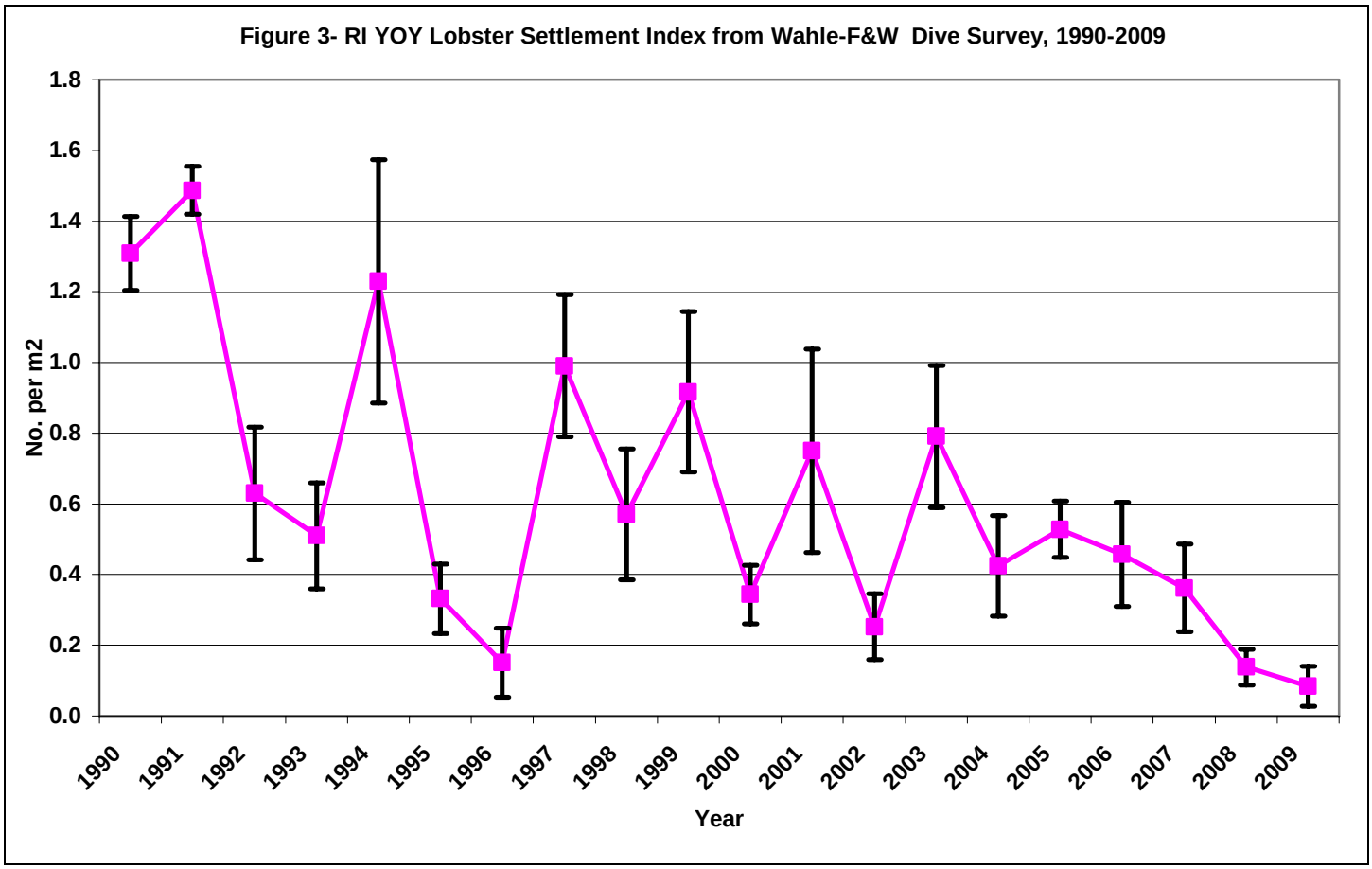
Figure 3- RI YOY Lobster Settlement Index from Wahle-F&W Dive Survey, 1990-2009
No. per m2
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Year

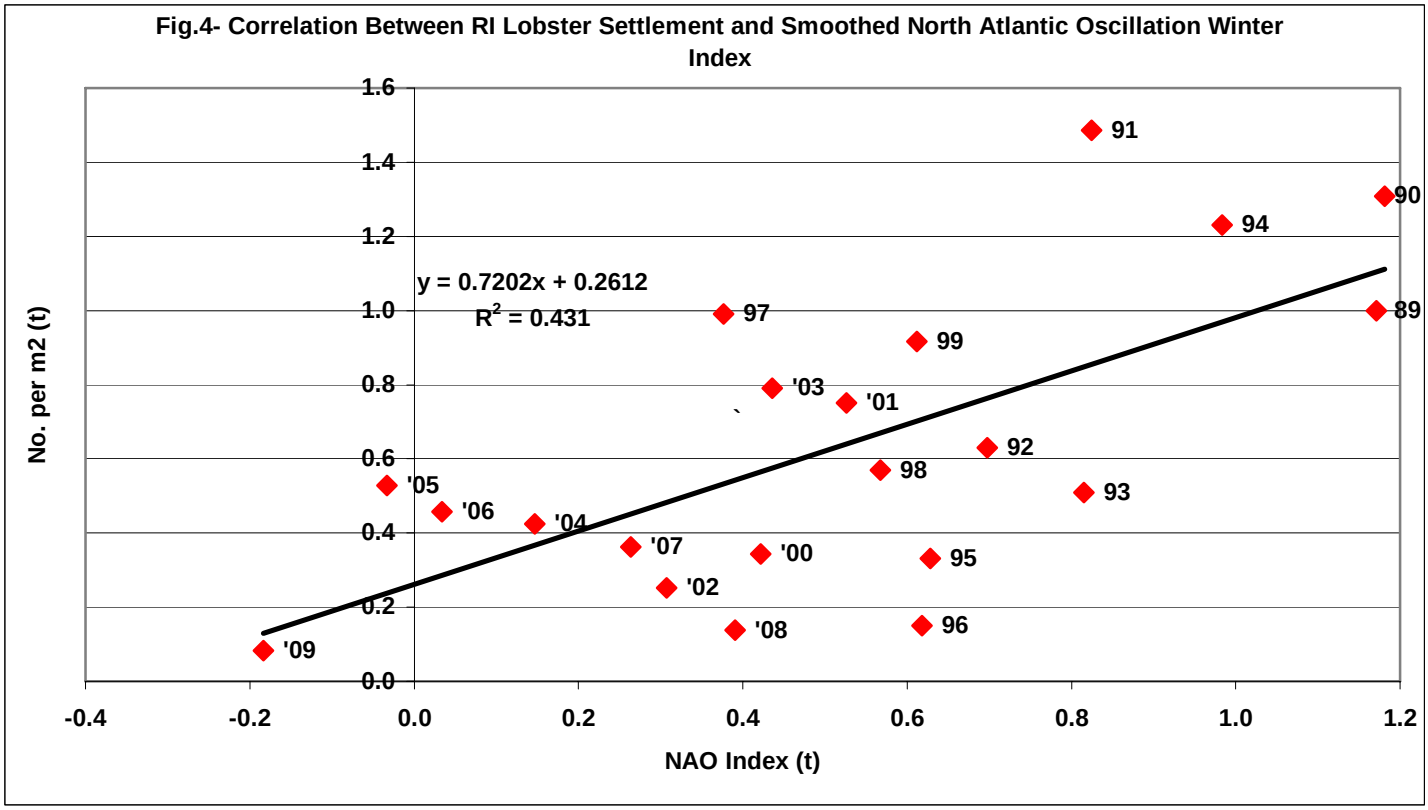
Fig.4- Correlation Between RI Lobster Settlement and Smoothed North Atlantic Oscillation Winter Index
No. per m2 (t)
NAO Index (t)
y = 0.7202x + 0.2612
R2 = 0.431
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.4
-0.2
0.0
0.2
0.4
0.6
0.8
1.0
1.2
91
90
94
89
97
99
'03
'01
92
98
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'05
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'04
'07
'00
95
'02
'08
96
'09

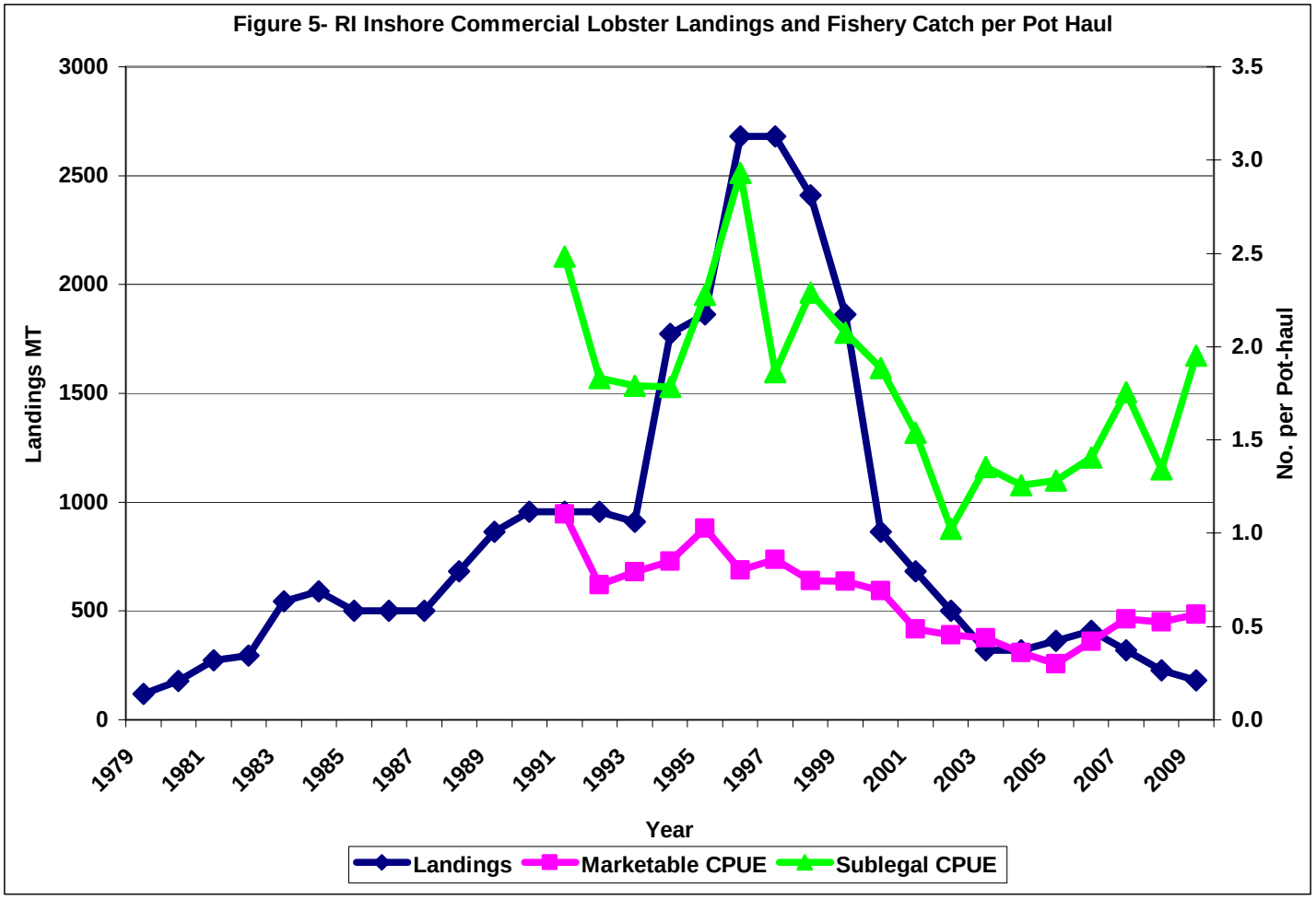


Figure 6 – Total lobster abundance as estimated by the University of Maine Length Based Model in the 2009 lobster stock assessment. The median (yellow) and 25th percentile (red) of the 1984-2003 reference period are noted.

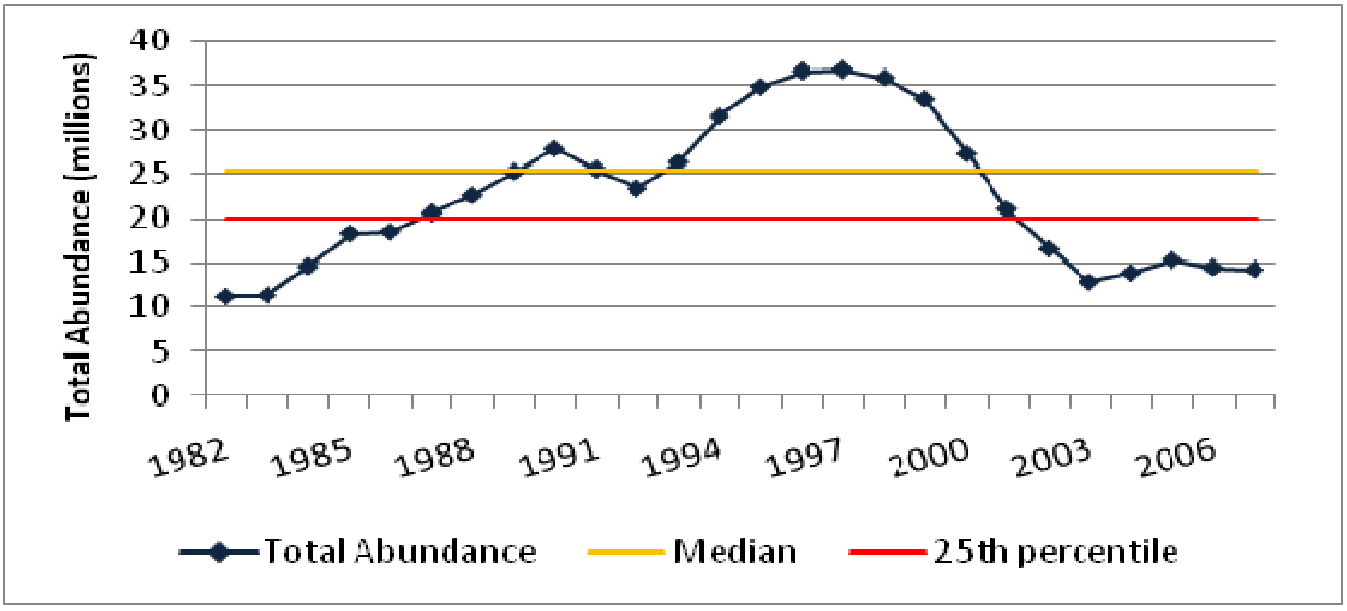


Figure 7- RI Cancer Crab Fishing Mortality Rate Compared to MSY Reference Level

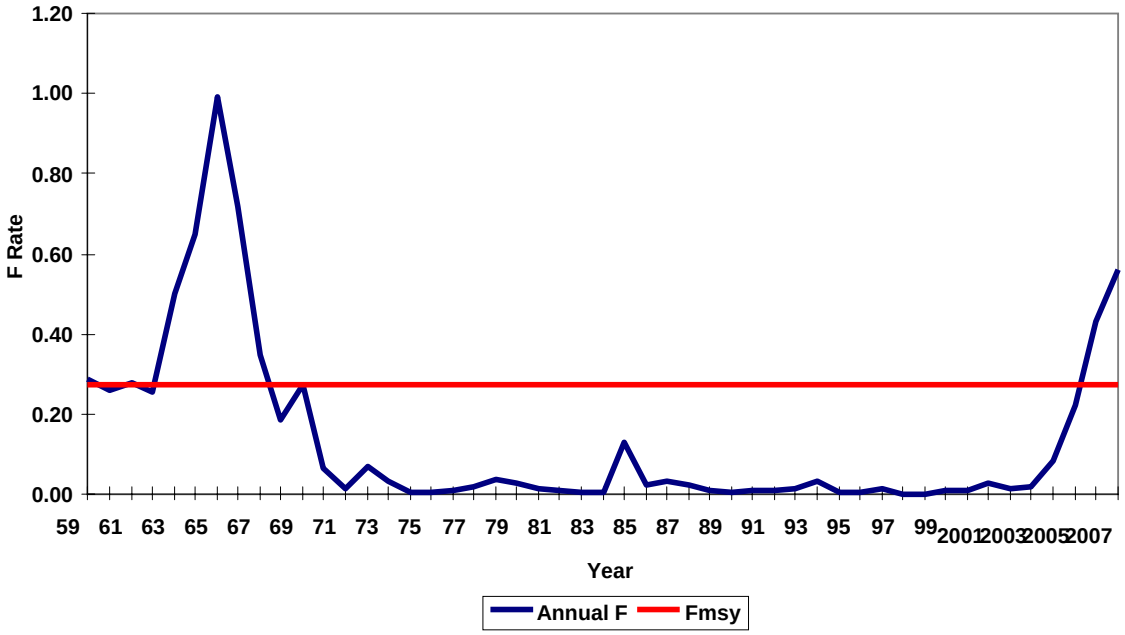


Figure 8- RI Cancer Crab Abundance and Landings Compared to MSY Reference Level

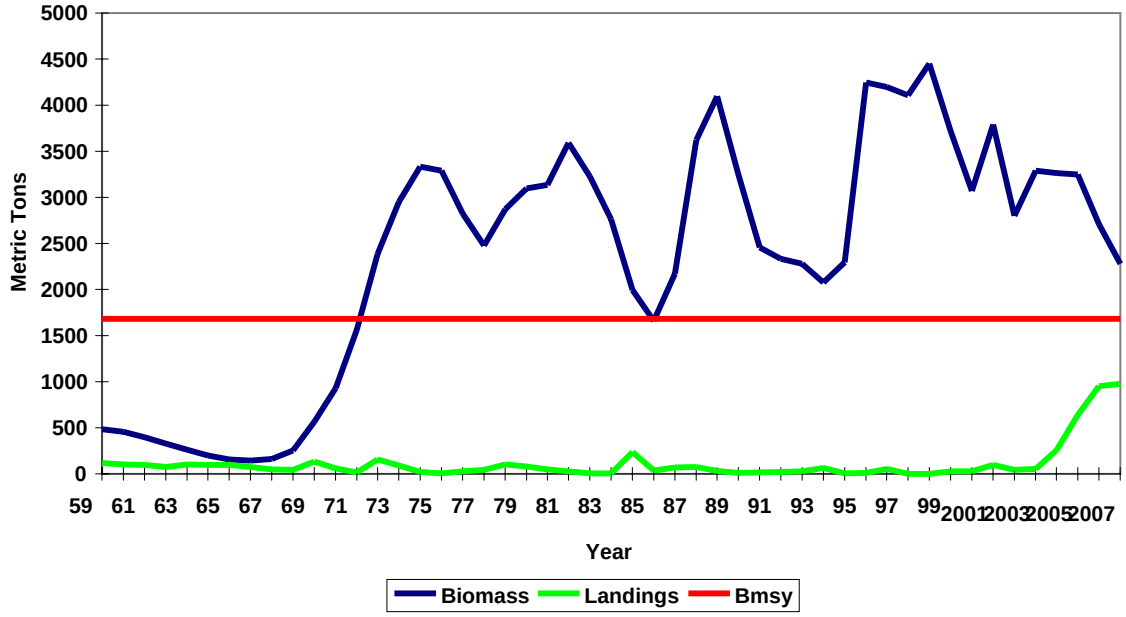


Figure 9- RI Horseshoe Crab Abundance and Landings Compared to MSY Reference Level

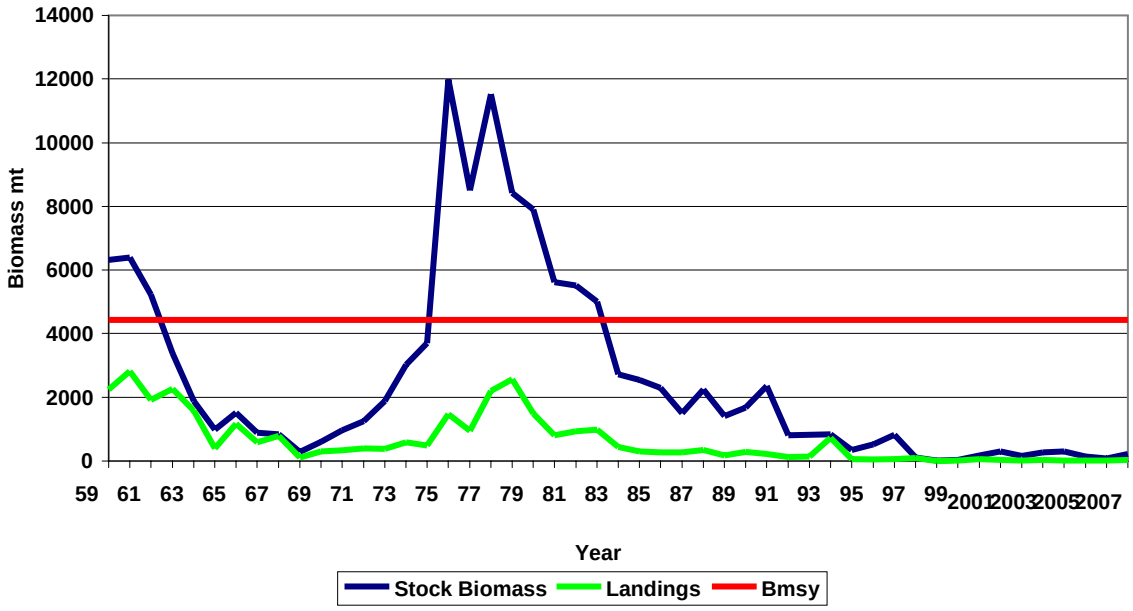
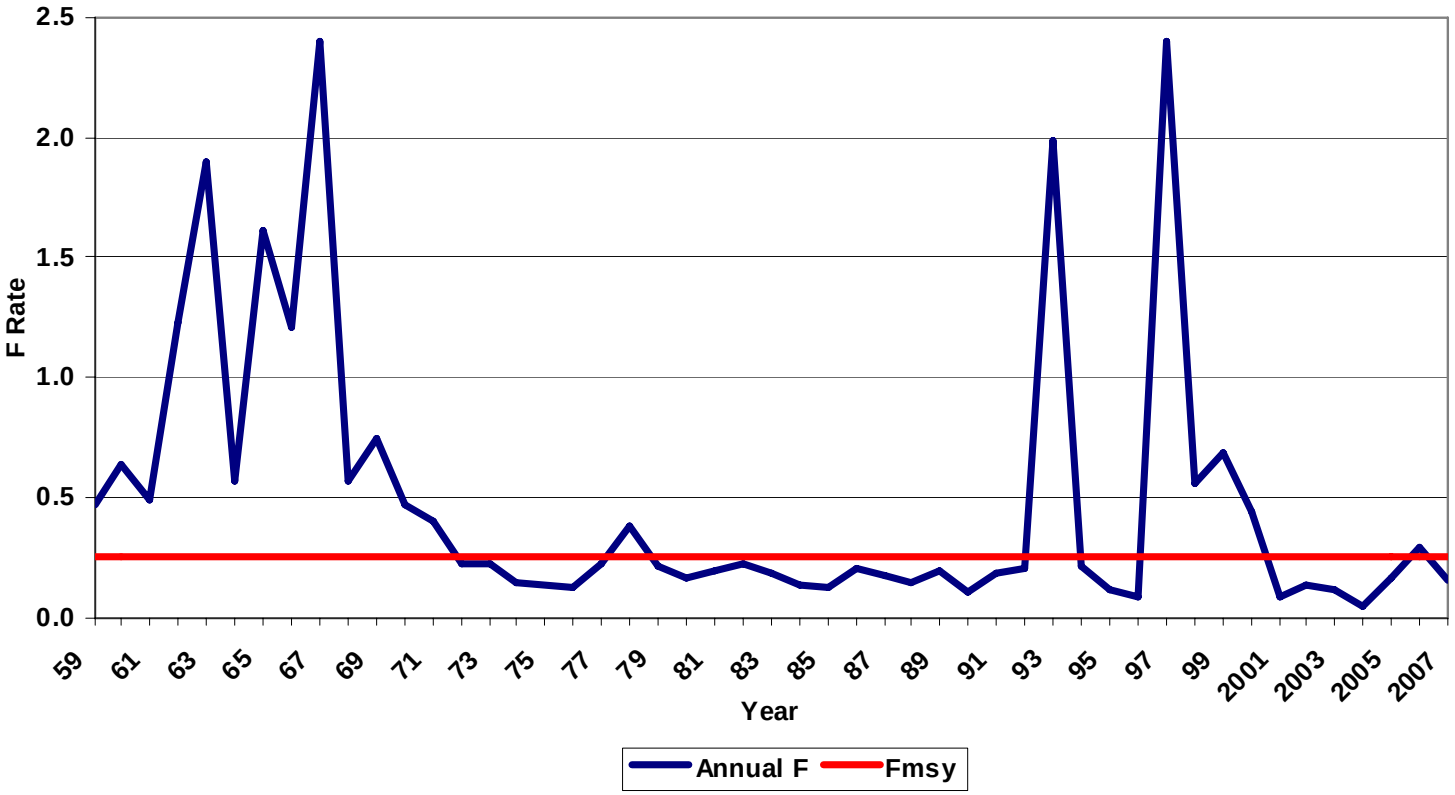


Figure 10- RI Horseshoe Crab Fishing Mortality Rate Compared to MSY Reference Level



Rule 8. EFFECTIVE DATE

The foregoing rules and regulations Rhode Island Marine Statutes and Regulations, after due notice, are hereby adopted and filed with the Secretary of State this ~~8th day of December, 2009~~ to become effective 20 days from filing, unless **otherwise indicated below**, in accordance with the provisions of Chapter 42-17.1, Section 20-1-4, Section 20-2.1 and Public Laws Chapter 02- 047, in accordance with Chapter 42-35 of the Rhode Island General Laws of 1956, as amended.

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W. Michael Sullivan, PhD
Director, Department of Environmental Management

Notice Given: ~~09/21/2009~~
Public Hearing: ~~10/21/2009~~

Filing date: ~~12/08/2009~~
Effective date: ~~12/28/2009~~