

Marine Stewardship Council Full Assessment
Final Report and Determination
Gulf of Maine Lobster Fishery (*Homarus americanus*)

For the

Maine Certified Sustainable Lobster Association (MCSLA)

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Glossary

ALWTRP	Atlantic Large Whale Take Reduction Plan
ASMFC	Atlantic States Marine Fisheries Commission
B_{lim}	Stock size below which the recruitment would be impaired
B_{MSY}	Stock size that can produce maximum sustainable yield when it is fished at a level equal to F_{MSY}
CAB	Conformity Assessment Body
CL	Carapace Length
CoC	Chain of Custody
CPUE	Catch per Unit Effort
CR	Certification Requirements
DMR	Maine Department of Marine Resources
EAM	Ecosystem Approach Management
EEZ	Exclusive Economic Zone
ESA	Endangered Species act
ETP	Endangered, Threatened and Protected species
F	Fishing Mortality Rate
F_{lim}	Fishing mortality rate that causes a stock to fall below B_{lim}
F_{MSY}	Fishing mortality rate at the level that would produce maximum sustainable yield from a stock that has size of B_{MSY}
FAO	United Nations Food and Agriculture Organization
FMP	Fishery Management Plan
GBK	Georges Bank
GMRI	Gulf of Maine Research Institute
GoM	Gulf of Maine
HCR	Harvest Control Rule
IFMP	Interstate Fishery Management Plan
lbs	pounds
LCMA	Lobster Conservation Management Area
LCMT	Lobster Conservation Management Team
LRP	Limit Reference Point
MCSLA	Maine Certified Sustainable Lobster Association (Client)
MMAP	Marine Mammal Authorization Program
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Act
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield, it is the largest average catch that can be continuously taken from a stock under existing environmental conditions
mt	Metric tons
NEFSC	New England Fisheries Science Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PA	Precautionary Approach
PBR	Potential Biological Removal

P1	MSC Principle 1
P2	MSC Principle2
P3	MSC Principe 3
PI	MSC Performance Indicator
SAR	Stock Assessment Report
SASC	Lobster Stock Assessment Sub-Committee
SNE	Southern New England
SSB	Female Spawning Biomass
STSSN	Sea Turtle Strangling and Salvage Network
UoC	Unit of Certification
VTR	Vessel Trip Report

1. MSC Fishery Assessment Report

Fishery Unit	This assessment report under the 'Unit of Certification' (UoC) covers one target species and one method of capture and the resulting scores are for landings by registered licence holders. The fishery under assessment covers all commercial vessels licensed by the State of Maine and the National Marine Fisheries Service (NMFS) that land and sell lobster to the MCSLA and fish within the Atlantic States Marine Fisheries Commission (ASMFC) Lobster Conservation Management Area 1 (Figure 1), which includes the Gulf of Maine stock in coastal Maine and Northwest Atlantic FAO area 21.	
Report Issue	25 th March 2016	• Client Report
	23 rd June 2016	• Peer Review
	30 th August 2016	• Public Comment Draft Report
	X November 2016	• Final Report and Determination
		• Public Certification Report
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The aim of this assessment is to determine the degree of compliance of the fishery with the Marine Stewardship Council's (MSC) Principles and Criteria for Sustainable Fishing.

This Final Report and Determination is written for the stakeholders after the site visit, scoring, client review, peer review, and the stakeholder consultation on the PCDR, and contains:

- The MSC Standard and Certification Requirements (CR) used, MSC Fishery Standard - Principles and Criteria for Sustainable Fishing v1.1 and the MSC CR v1.3
- The scores, weighting and certification outcome (Section 7)
- All intended conditions set and the Client Action Plan in Appendix 1.3

'Conditions provide for agreed further improvement in the fishery and provide one of the bases for subsequent audit. They are intended to improve performance against the MSC Principles'.

- The assessment team certification recommendation
- The final decision from the Certification Committee on the fishery certification (section 7.4)
- The peer reviewers 'comments and assessment team's responses in Appendix 2
- The stakeholders 'submissions and assessment team's responses in Appendix 3
- The assessment followed the current versions of MSC scheme requirements and these were implemented by SAI Global accredited MSC Procedures.
- Information sources used are provided throughout the report and full references for published, unpublished data and main websites accessed are documented at the end of this report in the reference section.

2. Executive Summary

This report sets out the details of the MSC full assessment for the Gulf of Maine Lobster (*Homarus americanus*) Fishery against the MSC Principles and Criteria for Sustainable Fisheries. The report details the background, results and justification of the fishery, carried out by SAI Global.

The assessment process began in September 2014. As a requirement of the assessment process (CR 27.9.1), the site visit announcement was advertised in the following local online newspaper, *saving sea food.org* X, as it was felt this was the most appropriate publication for this fishery.

The MSC Guidelines to Conformity Assessment Body (CAB) specify that the Unit of Certification (UoC) is “The fisheries or fish stock (biologically distinct unit) combined with the fishing method/gear and practice (vessel(s) pursuing the fish of that stock) and management framework”. Accordingly, the Gulf of Maine Lobster Fishery proposed for certification is defined according to the UoC:

Species	<i>Homarus americanus</i> , American Lobster
Geographical Area	FAO Fishing Area 21 Northwest Atlantic LCMA 1.
Stock	Gulf of Maine
Method of capture	Baited Traps
Management system	Atlantic States Marine Fisheries Commission (ASMFC) Maine Department of Marine Resources (DMR) National Marine Fisheries Service (NMFS)
Client Group	Maine Certified Sustainable Lobster Association, Inc. (MCSLA)

This fishery has previously been assessed against the MSC Principles and Criteria for Sustainable Fishing under a previous certificate. The current assessment did require harmonization taking into account another assessment led by a different CAB to ensure consistency of assessment outcomes as there is other Maine lobster fishery undergoing certification (See Section 5.1).

The Gulf of Maine lobster trap fishery under assessment covers all commercial vessels licensed by the State of Maine and NMFS that land and sell lobster to the MCSLA and fish within LCMA 1, which includes the Gulf of Maine stock in coastal Maine and Northwest Atlantic FAO area 21.

The Maine Certified Sustainable Lobster Association is an open collaborative effort between the private and public stakeholders of the lobster fishery in Maine¹. The goal is to educate and guide their members about various certified sustainability programs that meet member needs for their respective customers.

A full and up to date active list of client group members was provided to SAI Global (see section 6).

As required by MSC CR 27.23.1, a certificate sharing commitment must be made by the applicant fishery. The Client Sharing Letter can be seen at:

https://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/north-west-atlantic/gulf-of-maine-lobster/assessment-downloads-1/20140820_Cert_Sharing_LOB478.pdf

¹ <http://www.maine-certified.org/home.html>

2.1 Gulf of Maine Lobster fishery key strengths and weaknesses

Strengths	Weaknesses
<ul style="list-style-type: none"> ● Gulf of Maine Lobster has high abundance based on Long Term Fishery independent based CPUE and Biomass. ● Gulf of Maine Lobster has strong recruitment to the fishery in the last years. ● Gulf of Maine Lobster has healthy spawner biomass stock. ● There is a strategy in place for managing the fishery's impacts on ETP species. ● The fishery is highly unlikely to disrupt key elements underlying ecosystem structure and function ● Robust governance and policy. 	<ul style="list-style-type: none"> ● Well-defined harvest control rules are not in place ● Information on fishing effort is not sufficient. ● Sufficient data does not continue to be collect to detect any increase in risk to main bycatch species. ● There is no partial strategy is in place to ensure the fishery does not pose a risk of serious or irreversible harm to habitats. ● Clear long term objectives that guide decision-making are not explicit within the management policy. ● Short and long term objectives are not explicit within the fishery's management system. ● The is no updated research plan.

2.2 Assessment Results

A rigorous assessment against the MSC Principles and Criteria was undertaken by the assessment team and detailed, fully referenced scoring rationale is provided in Appendix 1 of this report.

The UoC achieved the minimum required score of 80 or above on each of the three MSC Principles independently and did not score less than 60 against any Performance Indicator (PI). Final Principles scores are shown in the table below.

Principle	Score	PASS/FAIL
Principle 1 – Target Species	85.6	PASS*
Principle 2 – Ecosystem	81.3	PASS*
Principle 3 – Management System	81.3	PASS*

*Although the assessment team found the overall Principle and Unit of Certification in overall compliance with MSC Standard, it also found the performance of 6 performance indicators to be below the established compliance mark (Score of 80). Full explanation of these conditions is provided in Appendix 1.3.

2.3 Conditions for continued certification and Recommendation

Conditions

6 PIs which contribute to the overall assessment score were assessed as scoring less than the unconditional pass mark, and therefore four conditions were attached to the fishery, which must be addressed within a specified timeframe. The condition is applied to improve performance to at least the 80 level within a period set by the certification body but no longer than the term of the certification. A full explanation of how the Client intends to meet these conditions is provided in the client action plan in Appendix 1.3 of the report. As a standard requirement of the MSC CR, the fishery shall be subject to (as a minimum) annual surveillance audits. These audits shall be publicised and reports made publicly available.

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/A)
1	The client must provide evidence that well-defined HCRs, taking into account main uncertainties, are in place and ensure that the exploitation rate is reduced as limit reference points are approached.	1.2.2	NA
2	The client must provide evidence that sufficient data continue to be collected to detect any increase in risk to main bycatch species.	2.2.3	NA
3	The client must provide evidence that a partial strategy is in place to ensure the fishery does not pose a risk of serious or irreversible harm to habitats, that there is some objective basis for confidence that the partial strategy will work, and that there is some evidence that the partial strategy is being implemented successfully.	2.4.2	NA
4	The client must provide documented evidence that clear long-term objectives for the GOM lobster fishery, which guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach and are explicit within management policy have been adopted.	3.1.3	NA
5	The client must provide documented evidence that the GOM lobster fishery has adopted short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 and are explicit within the fishery's management system have been adopted.	3.2.1	NA
6	The client must provide documented evidence that the GOM lobster fishery has a research plan that provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	3.2.4	NA

Recommendation

A recommendation is not obligatory and does not require a client action plan as for a condition. It means that it does not have to be implemented to maintain the certification. But the client is encourage to act upon within the spirit of the MSC certification.

The assessment team recommends that a reliable estimate of total fishing effort should be developed.

2.4 Certification Recommendation

On completion of the scoring process, the assessment team has recommended that the Gulf of Maine lobster fishery is eligible to be certified according to the MSC Principles and Criteria for Sustainable Fishing subject to condition and client action plan outlined in the report.

2.5 Assessment Process

The assessment followed set procedures as described in the MSC CR v1.3. Key stages of the assessment were:

- **Stage 1: Fishery Announcement and Assessment Team Formation**
 - Stakeholder Notification: Fishery enters full assessment – 2nd September 2014
 - Stakeholder Notification: Assessment team nominated – 2nd September 2014
 - Stakeholder Notification: Assessment team confirmation - 18th September 2014
- **Stage 2: Building the Assessment Tree**
 - Stakeholder Notification: Use of the default assessment tree - 18th September 2014
- **Stage 3: Information gathering, stakeholder meetings and scoring**
 - Stakeholder Notification: Site Visit scheduled – 18th September 2014
- **Stage 4: Client and peer review**
 - Stakeholder Notification: Revised timeline – 22nd January 2015
 - Stakeholder Notification: New assessment team member and change in lead – 21st July 2015
 - Stakeholder Notification: VR and Response to VR – 21st July 2015
 - Stakeholder Notification: Additional stakeholder consultation period – 21st July 2015
 - Stakeholder Notification: Revised timeline – 21st July 2015
 - Stakeholder Notification: Revised timeline – 6th October 2015
 - Stakeholder Notification: Revised timeline – 4th January 2016
 - Stakeholder Notification: Peer Reviewers proposed – 7th April 2016
 - Stakeholder Notification: Revised timeline – 7th April 2016
 - Stakeholder Notification: VR and Response to VR – 7th April 2016
- **Stage 5: Public Review of the draft assessment report**
 - Stakeholder Notification: Public Comment Draft Report issued – 30th August 2016
 - Stakeholder Notification: Change in the Target Eligibility Date

3. Authorship and Peer Reviewers

3.1 Assessment team

Dr. Ivan Mateo (Assessor, Responsibilities on Principle 1)

Dr. Mateo has over 15 years' experience working with natural resources population dynamic modelling. His specialization is in fish and crustacean population dynamics, stock assessment, evaluation of management strategies for exploited populations, bioenergetics, ecosystem-based assessment, and ecological statistical analysis. Dr. Mateo received a Ph.D. in Environmental Sciences with Fisheries specialization from the University of Rhode Island. He has studied population dynamics of economically important species as well as candidate species for endangered species listing from many different regions of the world such as the Caribbean, the Northeast US Coast, Gulf of California, and Alaska. He has done research with NMFS Northeast Fisheries Science Center Ecosystem Based Fishery Management on bioenergetics modelling for Atlantic cod. He also has been working as environmental consultant in the Caribbean doing field work and looking at the effects of industrialization on essential fish habitats and for the Environmental Defense Fund developing population dynamics models for data poor stocks in the Gulf of California. Recently Dr. Mateo worked as National Research Council postdoctoral research associate at the NOAA National Marine Fisheries Services Ted Stevens Marine Research Institute on population dynamic modelling of Alaska sablefish.

Dr. Jerry (Gerald) Ennis (Assessor, Responsibilities in Principle 1)

Following undergraduate and graduate degrees at Memorial University of Newfoundland in the 1960s, Dr. Ennis completed a Ph.D. in marine biology at University of Liverpool in the early 1970s. He retired in 2005 following a 37-year research career with the Science Branch of the Department of Fisheries and Oceans. His extensively published work has focused primarily on lobster fishery and population biology and on various aspects of larval, juvenile and adult lobster behaviour and ecology in Newfoundland waters. Throughout his career, Dr. Ennis was heavily involved in the review and formulation of scientific advice for management of shellfish in Atlantic Canada as well as the advisory/consultative part of managing the Newfoundland lobster fishery.

Dr. Géraldine Criquet (Lead Assessor, Responsibilities on Principle 2)

Géraldine manages technical functions of SAI Global's MSC Fishery Program and is an approved MSC Fishery Team Leader. Géraldine holds a PhD in Marine Ecology (École Pratique des Hautes Études, France) which focused on coral reef fisheries management, Marine Protected Areas and fish ecology. She has also been involved during 2 years in stock assessments of pelagic resources in the Biscay Gulf, collaborating with IFREMER. She worked 2 years for the Institut de Recherche pour le Développement (IRD) at Reunion Island for studying fish target species growth and connectivity between fish populations in the Indian Ocean using otolith analysis. She served as Consultant for FAO on a Mediterranean Fisheries Program (COPEMED) and developed and implemented during 2 years a monitoring program of catches and fishing effort in the Marine Natural Reserve of Cerbère-Banyuls (France). Geraldine joined SAI Global in August 2012 as Fisheries Assessment Officer and is involved in FAO RFM and MSC fisheries assessments.

Dr. Eric Dunne (Assessor, Responsibilities on Principle 3)

Eric has over 45 years' experience in the economic, policy and operations analyses and executive management of the full range of fishery management activities and functions. Since 1995, he has been a fishery consultant based in St. John's, Newfoundland, Canada, specializing in comprehensive analysis of all aspects of fisheries management activities and issues. With an educational background in the economics of fishing, he had previously held senior positions in the Department's economics and policy development functions. He later gained experience in the area of fisheries innovation and technology development. As well, he has lectured on fisheries management and fisheries economics in the Masters of Marine Studies Program at Memorial University of Newfoundland and Labrador. Most recently he has become fully versed in the overall MSC assessment process. In this context, he has assessed all aspects of the management systems utilised for a variety of finfish and shellfish fisheries from the sub-Arctic areas of the Northwest Atlantic to the Gulf of Mexico.

3.2 Peer Reviewers

Julian Addison

After 28 years at the Centre for Environment, Fisheries and Aquaculture Science (Cefas), which is the UK Government's marine science agency for environment, fisheries and aquatic science, Julian left the organisation to move to France with my family and to work for myself. Relevant skills and experience include 30 years experience of stock assessment and provision of management advice on shellfish and inshore fisheries, extensive shellfish research primarily in the field of crustacean population dynamics and assessment, extensive knowledge of the UK shellfish and inshore fisheries industry and liaison with fishers and other stakeholder groups, knowledge of shellfisheries management regimes worldwide, effective oral and written communication skills and winning of contracts under competitive tender.

Bob Allain

R. J. (Bob) Allain is the president and principal consultant of OceanIQ Management Services Inc. He is a former senior executive with over 30 years experience with Canada's Federal Department of Fisheries and Oceans in fisheries management, strategic policy development and analysis, program design and delivery, human and financial resources management, media and inter-governmental relations, facilitation and conflict resolution, and mentoring. He has consulted internationally for the Canadian International Development Agency, the (former) International Centre for Ocean Development, the World Bank, and the Food and Agricultural Organization of the United Nations. He has participated in, and spoken at, international conferences in the United States, Ireland and Australia and has given over 600 media interviews to national and international news agencies while in government service.

4. Description of the Fishery

4.1 Unit of Certification and scope of certification sought

The MSC Guidelines to CAB specify that the UoC is "The fisheries or fish stock (biologically distinct unit) combined with the fishing method/gear and practice (vessel(s) pursuing the fish of that stock) and management framework". Accordingly, Gulf of Maine Lobster Fishery proposed for certification is defined according to the UoC:

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Management system	Atlantic States Marine Fisheries Commission (ASMFC) Maine Department of Marine Resources (DMR) National Marine Fisheries Service (NMFS)
Client Group	Maine Certified Sustainable Lobster Association, Inc. (MCSLA)

4.1.1 Eligibility for Certification against the MSC Standard

The fishery is eligible for certification and able to be assessed within the scope of the MSC Principles and Criteria for Sustainable Fishing as:

- The fishery is not conducted under a controversial unilateral exemption to an international agreement;
- Fishing operations do not use destructive fishing practices such as fishing with poisons or explosives;
- The fishery applying for certification is not the subject of controversy and/or dispute;
- The fishery has not previously failed an assessment or had a certificate withdrawn;
- The Client Group is prepared to consider how other eligible fishers may share the certificate;
- There are no catches of non-target stocks that are inseparable or practicably inseparable (IPI) from the target stock; and
- The assessment of the Gulf of Maine Fishery will result in an overlapping assessment (See section 5.1).

4.1.2 Eligible fishers

There are other lobster fisheries in the Gulf of Maine. They may become eligible to join the Client Group under a certificate sharing arrangement.

4.1.3 Scope of Assessment in Relation to Enhanced Fisheries

The fishery under assessment is not an enhanced fishery.

4.1.4 Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF)

The fishery under assessment is not an Introduced Species Based Fishery.

4.2. Overview of the fishery

4.2.1. Biology of the target species

Taxonomy and geographic range

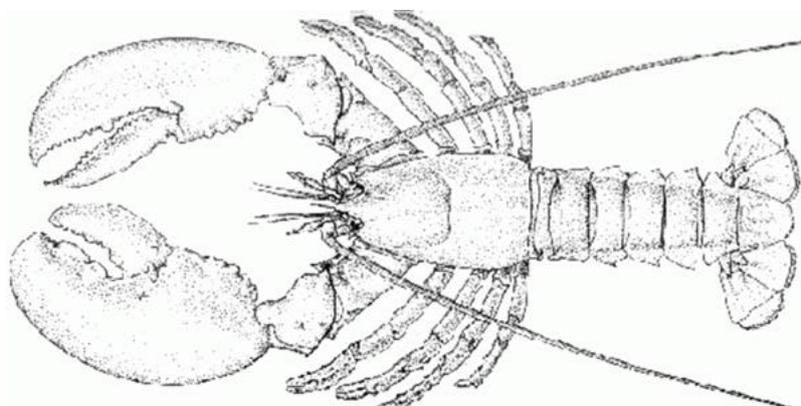


Figure 1. *Homarus americanus*. Source: FAO species fact sheet².

The American lobster, *Homarus americanus* (H. Milne Edwards, 1837), is a crustacean belonging to the family Nephropidae. It is distributed from Cape Hatteras in North Carolina to Newfoundland to the Strait of Belle Isle that separates Labrador and Newfoundland. The largest populations are found in the Gulf of Maine, southwest Nova Scotia and in the southern Gulf of St. Lawrence.

Stock structure

Lobsters are known to migrate seasonally in response to the seasonal change in water temperatures and climate conditions. They migrate to shallow waters in the spring to moult, reproduce or hatch eggs and return to deeper waters in the fall. The movement or migrations of adults can be extensive and cover considerable distances (Campbell et al. 1984). There is evidence that some females and males in the southern New England continental shelf undergo seasonal return migrations of up to 200 km (Uzmann et al. 1977). Tagging studies have shown a fair exchange of mature lobster between inshore and offshore waters off southwestern Nova Scotia, with few lobsters reaching as far afield as Georges Banks (Campbell and Stasko 1985; Campbell 1989). However, long-range movement of adult lobsters from the outer Atlantic coast of Nova Scotia to offshore banks is extremely rare and there are no records of long-range movements of adult lobsters out of or into the Gulf of St Lawrence (Harding et al. 1997). A tagging study by Bowlby et al. (2008) showed that the total distance moved by lobster

² http://www.fao.org/fi/common/format/popUplImage.jsp?xp_imageid=697045&xp_showpos=1

released in central LFA 25 averaged 24.3 km (S.D. \pm 17.7), and that stock mixing among management zones (LFAs) was not observed. Likewise, den Heyer et al. (2009) showed that maximum and mean displacements between release and recapture were 58.3 and 12.3 km, respectively in Northumberland Strait (LFA 25).

Lobster larval dispersal and circulation patterns suggest that there is likely a high degree of connectivity between exploited populations in the Northwestern Atlantic. Larval dispersal and population genetics studies in the Southern Gulf of St Lawrence (SGSL) all suggest that the lobster population in this region can be considered homogeneous (Harding et al. 1997; Chassé and Miller 2010). Harding et al. (1997) indicated that lobsters from the Southern Gulf of St Lawrence, Nova Scotia and Georges Bank are not genetically isolated. However, the authors observed that Gulf of St Lawrence lobsters were about three times as genetically distant from Nova Scotia and Georges Bank lobsters. This slight genetic distinction might have evolved in response to the predominantly “one way” drift of larvae from the Gulf of St Lawrence, forming a partial hydrographic barrier to gene flow. In a more recent genetic study, Kenchington et al. (2009) found that samples in the Gulf of St. Lawrence, with low genetic differentiation, differed from samples from Fundy to Cape Cod, in which genetic differentiation is higher. This is postulated to result from a shelf-edge post-glacial colonisation process, in which lobsters forced onto the southern continental slopes by low temperature and falling water level during the last ice age later re-colonised northwards along the slope and into newly available embayments as the ice retreated, thus creating a south-north genetic difference that is now maintained by contemporary patterns of bathymetry, temperature, and circulation. Deep water lobster populations along the shelf could then be a relic of this post-glacial expansion.

Stock structure has recently been described by a new study of lobster genetics along the coast of North America, which analysed DNA from 2,500 lobsters, mainly egg bearing females, from 34 sites across the geographic range and from coastal and deep waters (Kenchington et al 2009). Northern samples around the Gulf of St Lawrence showed significantly lower genetic differentiation than southern samples taken from Fundy to Cape Cod, and when the data were screened to identify areas of low gene flow between neighbouring samples, only a single barrier was found in the northern area, but, somewhat unexpectedly, seven areas of reduced gene flow were found in the southern area (Grand Manan, Lobster Bay (New Brunswick), Boothbay (Maine) plus Crowell Basin, Buzzards Bay (Massachusetts), Long Island Sound, Cape Cod to Georges Bank, Georges Basin, and south of Browns Bank). It is postulated that during the last ice age lobsters were forced onto the southern continental slopes by low temperature and falling water level, but then, as the ice retreated, they re-colonised northwards along the slope and into newly available embayments, thus creating patterns of genetic difference that are being maintained by contemporary patterns of bathymetry, temperature, and circulation. The significance of the gene flow barriers for stock management has not yet been worked out.

A study on the connectivity of lobster populations in the coastal Gulf of Maine (Incze et al 2010) suggested that lobster self-recruitment was important. The inshore concentration of hatching, coupled with faster development, contributed to a slow transport along the coast.

As a result, lobsters in the Gulf of Maine are considered as a single biological unit, and the defined unit of certification can therefore be considered appropriate.

Early Life History

Lobsters are shelter-seeking animals, living on the sea floor in a range of habitats, usually employing rocks, crevices, and burrows for cover when these are available, or undulations and gullies in the seabed when they are not. Shelter provides protection from predators at critical life history events such as moulting, reproduction, and egg-extrusion, and is therefore particularly important for newly settled post-larvae, growing juveniles, and mating and egg-carrying females. In rocky terrain

juvenile lobsters tend to stay within the confines of their shelters up to about 25-35 mm CL (3 to 4 years) after which they begin to forage more widely and adopt adolescent and eventually adult behaviour patterns. After emergence, lobsters exhibit strong olfactory behaviour that leads them to enter baited traps, especially at night.

The life history of a cohort begins with copulation in the summer or early fall, usually when the female is soft-shelled after the moult that follows the release of a previous egg batch, although insemination may not occur every year, and can also take place in the hard shelled state (Aiken and Waddy, 1980). After mating, eggs are extruded by the female and attached externally to the pleopods, to be carried under the abdomen for a 9 to 12 month incubation period, during which some loss of eggs can occur. In the following year, eggs hatch from the late spring to early fall, depending on the rate of maturation, and on regional variations in temperature. Once released into the water column, the larvae remain planktonic in the neuston layer for four life-stages before settling to the seabed. Food availability and temperature affect the rates of development and survival, and oceanographic conditions strongly influence the dispersal of larvae. The duration of the pelagic phase varies with ocean temperature, ranging from approximately 10 days at 23°C to nearly two months at 10°C, which affects both feeding and predation. Pelagic larvae can be retained by local gyres, or dispersed large distances. Lobsters are generally most abundant, and support the most productive fisheries, in coastal waters, embayments and basins that receive a regular supply of settling pelagic larvae (Wahle et al 2004, Incze et al 2006). Settlement is facilitated by geotactic, phototactic and thigmotactic behaviours that enable stage IV post larva to search for, select and take shelter in the preferred cobble/boulder substrates that are particularly prevalent along the coast of the Gulf of Maine (Wahle and Steneck, 1991 & 1992, Wahle and Incze, 1997).

Lobsters feed on a range of animals including crabs, molluscs, polychaete worms, and sea urchins, as well as fish, algae and other lobsters. In addition to being important predators, young American lobsters are also preyed upon by a variety of species, including fish (e.g., cod, sculpin, cunner, tautog, black and striped sea bass, etc.), sharks, rays, crabs and larger lobsters (Factor, 1995). During their first year, lobsters are relatively stationary, typically remaining within an area of a few square meters of their primary shelter, but as they grow their potential range increases, in some areas to a few miles only, and in other areas to much larger distances from tens to a hundred or more miles. In warmer waters, including some parts of the Gulf of Maine, some lobsters may stay in the same geographical locality for most of their life, where they may show a variety of local movements on the order of a few miles, whether to and fro along the coast, or from shallow to slightly deeper water and back. Others make more substantial inshore–offshore movements, leaving the coast to overwinter in deeper water and returning inshore in spring when the coastal waters warm up. Such a migration pattern is associated particularly with inshore lobsters that move seaward to such offshore banks as Grand Manan, or Browns Banks, or offshore lobsters that overwinter in canyons and then migrate shoreward in spring to such banks as Georges Bank (Factor, 1995)

Maturity and Reproduction

The ogive describing the relationship between size and the proportion of female lobsters that is mature varies considerably from one part of North America to another. For example, in the Gulf of St Lawrence the ogive covers the range 50-90 mm CL, with a mean size of 50% maturity at about 70 mm CL (Comeau & Savoie, 2002), whereas in the Gulf of Maine the ogive extends from 65-120 mm CL, with a 50% point at about 90 mm CL (ASMFC 2009a). Lobsters in this size range are believed to be at least 4 to 8 years of age at this point in their life.

Using data from Herrick (1896), Estrella and Cadrin (1995) showed that egg production is relatively low, increasing exponentially from approximately 17,000 at 100 mm CL to 220,700 at 200 mm CL.

Mating in the American lobster is polygynous (Cobb, 1995). It appears that females mate with the dominant male of their choice, and this male is capable of attracting and inseminating multiple females. Experimental observations suggest that males facilitate mating by occupying and defending shelters that are used by females whilst their shells harden after moulting and insemination (Karnofsky et al 1989). The Stock Assessment Report points out that in a polygynous system of this kind, which is common in decapods, it has hitherto been assumed that the supply of sperm is plentiful, and that the limiting resource is female egg production (ASMFC, 2009a), hence the decision to protect female spawners in many crustacean fisheries. In recent years, however, the sex ratio of lobsters in the Gulf of Maine has become highly skewed towards females, possibly due to the protection of eggers and v-notched females. This raises concerns about the possibility of sperm limitation, although there are potentially alleviating mechanisms, such as intermoult insemination (Waddy & Aiken, 1990), the ability to fertilise multiple clutches due to sperm storage by the female (Waddy & Aiken, 1986), and the evidence from genetics that a female can mate with more than one male (Gosselin et al, 2005)

Age and Growth

Important studies have recently been undertaken in Europe and North America to age lobsters by measuring the concentration of the pigment lipofuscin in neural tissue, where it accumulates over time. This method has been applied to wild caught *H. gammarus* off the east coast of England (Sheehy et al 1999, Sheehy & Bannister, 2002) and to *H. americanus* in Long Island Sound (Giannini, 2007). In both studies a lipofuscin-age key was obtained by first measuring lipofuscin in lobsters of known age (hatchery reared juveniles released into the sea and recaptured in the commercial fishery up to 12 years later, in England, and lobsters reared and held in aquaria for up to five years, in the USA).

Both studies confirm that lobster longevity is high (up to 70+ years of age at the top end of the wide size distribution sampled in England, and up to 22 years in the more restricted distribution sampled in

Lobster life history is dominated by the presence of the hard exoskeleton, which provides important protection from predators, and is cast periodically in order to facilitate growth. Lobsters need the protection of shelter at the moult, when they cease to move and feed. Since insemination usually occurs when females are in soft-shelled condition after a moult, the timing of the moult and reproductive cycles is linked.

Because hard parts of the body are lost at the moult, lobsters are not aged routinely and are instead assessed using size-based methods that calculate mortality rates by transforming the rate of change of numbers with size into a rate of change over time. This requires either growth equations or transition matrices that are derived from data on moult increment and moult probability. The former can be measured using data from tagging experiments, which show that moulting lobsters generally increase in size by about 15% in length and 50% in weight (Fogarty, 1995). Moult frequency, which is difficult to measure precisely, varies with life history stage and size (Factor, 1995): there are probably 20-30 moults from first stage larva to minimum legal size (81mm CL in the Gulf of Maine), after which moult frequency declines to 7-10 times in the first year (to reach a length of just 1-1.5 inches) to 3-4 times a year as juveniles, and to once a year or less in adulthood. Growth is believed to slow down after the onset of sexual maturity (Cadrian, 1995).

Growth rate varies regionally and with depth, due to differences in temperature, food availability, and activity. In warmer waters it is most likely to be slower, because although moult frequency may be higher at higher temperatures (Aiken, 1977), and therefore tends to be higher in warmer coastal waters than in cooler offshore waters (Aiken, 1980, Aiken & Waddy, 1986), this can be compensated by a smaller moult increment. The latter was shown by comparing moult increments between

lobsters in warm waters inshore and cool waters offshore (Fogarty and Idoine, 1988), and by observations indicating an inverse relationship between temperature and moult increment in Long Island Sound from 1979 to 2007 (DNC, 2008). On the other hand, lobsters may reach sexual maturity earlier in warmer waters (Templeman, 1936, Estrella and McKiernan 1989).

The size distribution observed in a lobster fishery results from the interaction between demography (growth rate and natural mortality), fishing mortality, lobster behaviour at the trap, and trap selectivity. In the Gulf of Maine, 99% of the size distribution in the commercial catch ranges from the minimum legal size of 81 mm CL up to just over 110 mm CL. The median length is about 90 mm in males, and slightly smaller in females, and the 25 to 75 percentiles range from about 85 to 95 mm in females, and 85mm to just over 90 mm in males. The strong left skew in this size distribution is strongly influenced by the relatively high exploitation rate. This is well shown by the size distributions obtained from surveys carried out using ventless traps, which show a rapid increase in the relative abundance of lobsters from 35 mm CL up to the minimum legal size of 82 mm CL, followed by a dramatic decrease in the catch proportion from 82 to 100 mm CL in the fished part of the size range.

The range of age at size was wide, and overlapped considerably between size groups, so that size alone gives a very poor prediction of age. In the English commercial size distribution the recruit size class contained 5 to 8 cohorts, indicating that there is a protracted recruitment process that must buffer the size distribution from year-class variation. This could in turn introduce error into the estimation of mortality when stocks are assessed by length-based models (Sheehy & Bannister, 2002), but as the technology required to measure lipofuscin is such that large samples of lobsters cannot yet be aged routinely, growth data based on conventional measures of moult increment and probability continue to be used in assessments.

Mortality

The perception is that because lobsters have a long life span and a low reproductive rate they are k-selected, leading to the assumption that after the dispersal and settlement of larvae, natural mortality is on average low. New age data, cited below, identify the presence of very old lobsters in the upper parts of the size distribution, confirming that this perception is reasonable. A value of $M=0.15$ was assumed for recruit and legal size lobsters in earlier assessments (Fogarty and Idoine, 1988, NEFSC 1993, 1996). The decline of key predators such as cod over the past 30 years is likely to have reduced natural mortality of lobsters over the same time period. In Southern New England, however, large mortalities have occurred periodically since the 1990s, and at one sampling location the prevalence of shell disease due to bacterial infestation has increased from zero prior to 1999 up to 15-20% since 2001. These incidents have prompted the current stock assessment to make additional model runs with higher values of M .

Recruitment

Over the last three decades there has been a significant tranche of research into various aspects of the lobster recruitment process in eastern US and Canada, especially in the Gulf of Maine, including the following:

- a) studies on the production and distribution of lobster larvae in the Gulf of St Lawrence (Hudon, 1987), the offshore banks of the Gulf of Maine (Harding and Trites, 1988) and Nova Scotia (Harding et al 1987)
- b) laboratory and field studies on the behaviour of post-larvae, their habitat selection, and predator avoidance (e.g. Cobb et al 1989a, 1989b, Wahle and Steneck, 1992, Katz et al 1994, Lawton and Lavalli, 1995)

- c) collection of standardised quantitative estimates of young-of-year settlement at a string of coastal sites in the Gulf of Maine using diver-based suction sampling and, more recently passive collectors, in order to produce a time series of coastal settlement indices (e.g. Wahle and Incze, 1997, Steneck and Wilson, 2001). In recent years sites have also been established in Nova Scotia, the Gulf of St Lawrence, and Newfoundland (time-limited).
- d) field and modelling studies of growing complexity into how the predominantly anti-clockwise circulation in the Gulf of Maine, and its seasonal and inter-annual variations, affect the dispersal, advection and settlement of post larvae year-on-year. (Harding et al 2005, Incze et al 2006, and Xue et al 2006, all of which contain a comprehensive list of citations).

The aim is to describe the process of recruitment from the pelagic phase through benthic settlement and on to the fishable stock, (Wahle, 1993; Fogarty, 1998, Palma et al 1999, Wahle 2003, Incze et 2003). It is hoped to clarify the relationships between various inshore and offshore lobster stock components, and to understand more clearly the relative importance of density-independent (larval supply) and density-dependent (settlement and benthic ecology) processes, with potentially important implications for lobster management (Ennis, 1995, Steneck and Acheson, 1997. Ultimately the work may also inform questions about the cause of the large increase in recruitment that has dominated the Gulf of Maine stock and fishery since the late 1980s (Incze et al, 2006)

4.2.2. Fishing area

The fishery being considered under this assessment is that portion of the Gulf of Maine stock fished by commercial vessels licensed by the State of Maine and NMFS, that land and sell lobster to the MCLSA, in the area designated as LCMA 1 by the ASMFC (Figure 2). This comprises parts of the NMFS statistical reporting areas 511, 512, 513, 514 and 515, and the north-western corner 467 (Cobscook Bay).

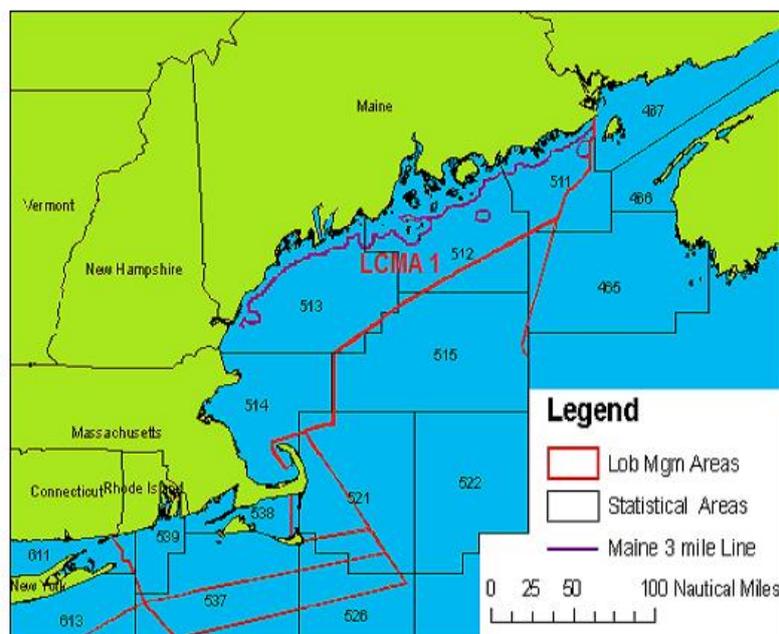


Figure 2. LCMA 1. Source: adapted from Wilson 2007.

4.2.3. History of the Gulf of Maine lobster fishery

Lobsters were among the many coastal species harvested by Native American Indians, and European colonists and settlers found them a dependable source of bait, food, and fertilizer. Early fisheries were conducted in shallow waters along the shoreline by hand, dip and hoop net, and gaffs (Nicosia and Lavalli 1999). In the 19th century lobster fishing in the Gulf of Maine also became a commercial activity and wooden lath traps became the dominant gear (Rathbun 1884). The fishery expanded outward from waters around Boston and New York as local stocks declined; the commercial fishery reached New Hampshire and Maine in the 1840s, coinciding with the development of a market for canned as well as fresh lobsters. Wooden lath traps became the dominant gear by 1840, fished singly or in short strings or trawls. Most lobstermen now use wire traps that are worked singly, or in strings of varying length, depending on location, depth, and bottom type.). The use of gasoline powered engines started around 1904.

The history of American lobster in the U.S. after 1840 was one of declining catches and average sizes of lobsters, and with periods of crisis, adjustments in fishing effort, and state and interstate attempts to come up with appropriate regulations (ASMFC 2009a; Acheson 2003). The first of these periods was in the 1870s, when declining lobster landings led states up and down the coast to implement minimum sizes and closed seasons; the state of Maine also instituted protection of berried female lobsters. Decline in landings, average sizes, and catch per trap, as well as struggles between and among dealers and harvesters led to a Convention in 1903 of representatives of all lobster fishing states plus Canada (Collins, 1904). This Convention was able to enact protections of berried females and prohibition of landing shelled lobster meat but little else, because of concerns about differing local conditions, enforcement issues, inadequacies of landing statistics, and so forth. Individual states responded then and in following years in the early 20th century with increases in size limits and other measures, and Maine instituted a maximum carapace length. V-notching of the tails came about as voluntary measures in Maine and Massachusetts, supported eventually by laws prohibiting the landing of V- notched lobsters.

Overall landings remained low from the 1920s through the 1940s, around 5,000 t, and increased slowly to the late 1970s, averaging nearly 14,000 t. Since then, landings have doubled to nearly 37,000 t in recent years, with increases in effort in inshore (0-3 nm) and nearshore (3-12 nm) areas and the development and intensification of an offshore fishery (12-200 nm), particularly after the mid-1960s with the development of a deep-water trap fishery in offshore canyons. Expansion of these fisheries coincided with decline in many other fisheries in the region. Landings doubled for reasons not yet fully explained (ASMFC, 2000; Drinkwater et al., 1996). In the meantime, as discussed below, lobster management came under the federal fisheries management system that came into effect in 1977, claiming for the nation a 200-mile exclusive economic zone (EEZ) and adding a layer of fisheries management for federal waters to a system that had been - and continues to be - dominated by states.

As a result, the American lobster now supports one of the most valuable commercial fisheries in the north-eastern US, with annual revenue in excess of \$370 million in 2007 (cited in ASMFC, 2009a). This revenue is derived from lobsters in three stock units defined on the basis of regional differences in life history parameters, viz., the Gulf of Maine and Southern New England stocks, which are primarily inshore, and the Georges Bank stock offshore.

The fishery being considered under this assessment is that portion of the Gulf of Maine stock fished by commercial vessels licensed by the State of Maine in the area designated as LCMA 1 by the ASMFC (Figure 2). This comprises parts of the NMFS statistical reporting areas 511, 512, 513, 514 and 515, and the northwestern corner 467 (Cobscook Bay). While comprehensive data for all reporting areas are available only through 2007, more recent data for the area under assessment are available through

the state of Maine’s annual landings program. Maine state landings have risen from 64 million pounds worth an estimated \$281 million (2007) to 96 million pounds worth an estimated \$318 million (2010).

The Gulf of Maine supports the largest US fishery, constituting 76% of US lobster landings between 1981 and 2007, compared to 19% from Southern New England and 5% from George’s Bank. From 1981 to 1989 Gulf of Maine landings were stable and averaged 14,600 t, but then increased dramatically from 19,200 t in 1990 to 37,300 t in 2006. The average was 33,000 t from 2000-2007, with a time series high of 37,297 t in 2006. The increase in landings in the Gulf of Maine was dominated by catches from the state of Maine, particularly from the mid-coast portion of the state. In Maine landings tripled between 1981 and 2003 and have remained high since this time. The period from 2004 to 2007 accounted for the three highest landings values in the time series (ASMFC 2009a:23). As shown in Figure 2, Maine landings have increased each year since then.

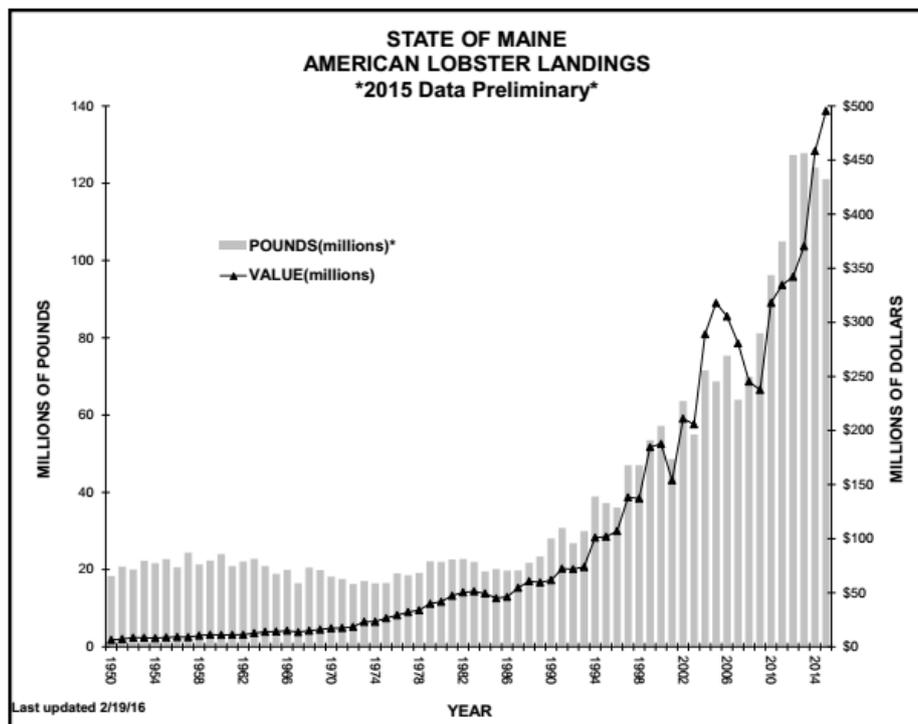
In recent years a large percentage of Maine lobster has gone to canneries, which have largely relocated to Atlantic Canada. This is predominantly new-shell lobster that cannot withstand long distance shipping to Maine's hard-shell customers. The majority of Maine's hard-shell lobsters are shipped live to the Europe, Florida, the West Coast of the U.S., and to major retail and restaurant chains such as Wal-Mart, Kroger's, and Red Lobster. Many are shipped to wholesalers in Boston and New York City.

4.2.4. State of Maine Lobster Catches

Landings continued to increase, to 127 million pounds in 2013, at the same level as in 2012 and well above all previous values.

Landings slightly decreased in 2014 and 2015 to 124 million pounds and 121 million pounds, respectively³ (Figure 3).

2015 lobster landings represents 44% of 2015 total commercial landings in Maine⁴.



³ <http://www.maine.gov/dmr/commercialfishing/documents/lobster.table.pdf>

⁴ <http://www.maine.gov/dmr/commercial-fishing/landings/documents/2015PoundsBySpecies.Pie.Graph.pdf>

Figure 3. The quantity and value of American lobster landed to the State of Maine.

Source: <http://www.maine.gov/dmr/commercialfishing/documents/lobster.graph.pdf>

There is a lobster recreational fishery in Maine. As with commercial harvesters, 10% of the non-commercial licence holders are selected annually randomly to provide monthly landings reports. In 2014, a total of 196 non-commercial harvesters were selected to report their landings. Of the 80 that reported landings, a total of 11,561 lbs of lobster were reported; 56 harvesters reported that they did not fish and 60 failed to report at all (DMR 2016, *pers. comm.*). Extrapolating from the data reported suggest that the recreational landings are approximately 0.1% of lobster total landings.

4.2.5. Fishing season

No fishing seasons are imposed by the regulations. Historically lobster fishing has been a seasonal activity, combined with other fisheries, and although lobster fishers have become more specialized, lobstering retains a strong seasonal pattern, with more activity in the 3rd and 4th quarters of the year (Gulf of Maine Research Institute 2008), although there is considerable variation. Within Maine, those in the “downeast” region have more seasonality than those in the southern part of the state. The landings pattern closely follows seasonal increases in temperature leading to the summer molt. While there is no formal start to the season it is usually considered to start in mid-April or early May. The fishery capitalizes on the summer inshore molt and pursues these lobsters further offshore in the fall and winter. The winter fishery is limited by falling water temperatures, inclement weather and the remaining availability of lobsters (Wilson 2007).

4.2.6. Fishing method and fleet description

This Maine lobster fleet is comprised mainly of small vessels (22-42 feet) operated by one or two people that make day trips in state waters (i.e. ≤ 3 miles from baselines), near shore waters (> 3 miles and < 12 miles) and offshore waters (> 12 miles) from numerous small ports that are scattered along the coastline and islands of Maine. Historically lobster fishing has been a seasonal activity, combined with other fisheries, and although lobster fishers have become more specialized, lobstering retains a strong seasonal pattern, with more activity in the 3rd and 4th quarters of the year (Gulf of Maine Research Institute 2008), although there is considerable variation. Within Maine, those in the “downeast” region have more seasonality than those in the southern part of the state. The landings pattern closely follows seasonal increases in temperature leading to the summer molt. While there is no formal start to the season it is usually considered to start in mid-April or early May. The fishery capitalizes on the summer inshore molt and pursues these lobsters further offshore in the fall and winter. The winter fishery is limited by falling water temperatures, inclement weather and the remaining availability of lobsters (Wilson 2007). Because of the seasonal nature of the fishery, the relatively small vessel size and permit endorsement, the distance the fleet operates from their home port means the Maine fishery does not extend to the full southerly extent of LCMA 1.

In 2010, the State of Maine issued 6,150 commercial lobster licenses. Approximately 20% (1,235) of these licence holders have a Federal permit endorsement to fish beyond Maine’s 3 mile limit in LCMA 1. Of the federal permitted vessels less than 10 have qualified and elected to fish in Area 3 (defined by the 25600 Loran line running approximately parallel to Maine’s shoreline, ~40 nautical miles from shore) (Wilson 2007). In 2010, only two Maine fishermen elected to fish in Area 3 (personal communication with Ann Tarr, DMR licensing manager, 2011).

The number of licensed lobstermen in the State of Maine has not increased, even since the 1950s (Acheson 2003: 16) and the present number of licenses is actually lower than the average of 6,721 of the period 1950-2000 (Acheson 2003: 16). In contrast, the fishing effort employed by the Gulf of Maine inshore/nearshore lobster fleet has grown significantly, as has dependence on the lobster resource,

as other fisheries have declined and access to them has become tightly controlled (Gulf of Maine Research Institute, 2008). “It is believed that many fishermen who previously targeted lobsters only part-time, or not at all are now exclusively dependent on the lobster resource” (Gulf of Maine Research Institute, 2008, pg 8). It is widely agreed that the increase in landings over the last two decades was fuelled by a major increase in effort. According to the ASMFC (2009a), the number of traps fished in the Gulf of Maine was fairly stable between 1982 and 1993, averaging approximately 2.3 million traps. However, from 1993 to 2002 the number of traps fished in the Gulf of Maine increased substantially, and in 2007 the state issued approximately 3.18 million trap tags. In 2010, this number had fallen to 2.95 million trap tags. The reduction is the result of a limited entry program that allows one new entrant, capable of fishing a maximum of 800 traps, for every 2400 to 4000 tags (number varies by zone) not renewed in the previous year.

Today most lobster traps - also known locally as “pots” - used in Maine’s fishery are constructed of plastic coated wire. They usually have two funnelled openings called “heads”, through which lobsters enter the first compartment commonly called the “kitchen” to feed on the bait – usually herring. After feeding, lobsters may venture through the inner funnel or parlour head into the compartment called the “parlour”. The traps are required to have unobstructed vents or gaps in the parlour section to allow undersize lobsters to escape. These may be rectangular or circular. The trap must also be equipped with a biodegradable panel – or “ghost panel”- which is designed to release lobsters from traps which are lost while fishing. Often times, the ghost panel and escape vent are combined into one unit by using ferrous metal rings to hold the plastic escape vent in place. The design of the trap is specified in regulation.

Traps account for more than 98% of the lobster fishery. Lobsters are also taken as a bycatch with otter trawls and gillnets but may not be landed in Maine. Recreational fishing occurs, especially in coastal waters, but only limited estimates of the catch are available. In 2010, a landings program sampling 10% of all Maine lobster license holders identified 37,016 pounds of lobster being landed for “personal use” (numbers are actual, not expanded). In Maine a maximum of 5 traps is permitted for recreational fishing. In New Hampshire and Massachusetts the limit is 10.

Trap limits are in place within the fishery with a maximum of 800 traps being applied.

There is considerable latent effort in the region’s lobster fisheries, as measured by license holders who landed less than 1,000 pounds in 2005 (Gulf of Maine Research Institute, 2008). Latent effort is far less in Maine than in other areas. Data for Maine are reported by state zones A-G, which ranged from 11 to 20% of latent effort in 2005; in contrast, the New Hampshire component of LCMA 1 was 70% and the Massachusetts component was 61% (Gulf of Maine Research Institute, 2008). In 2010, there were 5,977 commercial licenses issued, of which 4,276 were active and 1,701 were inactive. These individuals were allocated 3.01 million trap tags, of which 2,553,600 were fished (Jensen et al, 2011, citing Wilson’s analysis of 2010 dealer reporting data).

4.2.7. Market information

The American lobster supports one of the most valuable commercial fisheries in the north-eastern US, with annual revenue in excess of \$370 million in 2007 (ASMFC, 2009). DMR reports total landed value for Maine lobster in 2013 was \$364 million, a \$22 million increase over 2012 and \$30 million over 2011. The department reported bonuses received by lobster harvesters that, while they only include reports from 17 of 19 of Maine’s co-ops, total over \$14 million. Added to the overall landed value, the bonus figure brings the total to more than \$378 million. Live lobster; processed lobster products; and value-add lobster products are the main seafood products. Live lobster is graded and sold to domestic and international markets on the basis of lobster quality. The highest quality live lobster (oldshell, high blood protein) is generally sold internationally or held for long term storage given its

higher rate of survivability. Lower quality live lobster (new shell, low blood protein) is generally sold domestically and/or processed into lobster products. Processed lobster products include frozen raw lobster tails, frozen whole raw lobster, frozen whole cooked lobster, frozen and fresh cooked lobster meat. Frozen cooked lobster meat, in a variety of forms, is used by value-add manufacturers to produce soups, stews, pasta products, appetizer products, pies and a variety of other lobster specialty products. Lobster value-add products are generally sold domestically with some international distribution

4.3. Principle One: Target Species Background

4.3.1. Stock assessment

GoM lobster stock assessments are conducted by the ASMFC at 5-year intervals. They were done in 2004 and 2009 (ASMFC 2006, ASMFC 2009) and most recently in June 2015 (ASMFC 2015).

Stock Assessment Methods

Assessment of the GoM lobster stock has undergone extensive model development over the years. The University of Maine Stock Assessment Model (UMM) for American lobster was the primary model used by ASMFC (2009) and the only analytical model used in the 2015 assessment (ASMFC 2015). It was modified by the Lobster Stock Assessment Subcommittee to estimate sex-specific size distributions for new recruits, separate recruitment parameters for females and males in each year, accommodate nonlinear surveys (exponential or saturating relationships), calculate per recruit models more accurately, estimate growth transition matrices internally from tag data, calculate variances for recruitments and survey trends internally so that data are self-weighted, and model expected recruitments using recruit covariates. Each of these features was used in the 2015 assessment although the internally estimated growth transition matrix approach was dropped after testing because the method was not able to match the observed bimodal distributions of molt increments for lobsters that did and did not molt.

“Reference abundance” and “effective exploitation” are used as the primary descriptors of annual abundance and annual fishing pressure when presenting assessment model results. Reference abundance is the number of lobsters 78+ mm CL on January 1 plus the number that will molt and recruit to 78+ mm CL during the year. The 78 mm CL size is the lower end of the 78-82 mm size group which contains the lowest historical minimum legal size (81 mm) for lobsters in all three stocks. Effective exploitation is the estimated annual catch in number from the model divided by reference abundance. In other contexts (e.g. stock indicators), reference abundance and effective exploitation are based entirely on survey and landings data.

Effective exploitation and full recruit fishing mortality (full F) have similar trends but full F is higher and more variable. The relationship between the exploitation and fishing mortality measures in stock assessment results is not constant because of variability in size selectivity due to changes in regulations, size structure and recruitment. In contrast, the relationship between effective exploitation and full F is one-to-one in per recruit modeling which assumes constant size selectivity and recruitment.

In the model, female and male lobsters have separate population dynamics (including recruitment, mortality and growth). Five mm size groups are used so that all lobsters leave their original size bin when they molt. The model is length-based and there are 35 size bins starting at 53-57 mm CL.

Model inputs from ongoing monitoring include data on landings from dealers compiled in the NMFS weighout and canvass database by port and month, data from port and sea sampling of catches by

NMFS and agencies of the states of Maine, New Hampshire and Massachusetts as well as sea sampling conducted by the Atlantic Offshore Lobstermen's Association and the Commercial Fisheries Research Foundation, and data from spring and fall random stratified bottom trawl surveys conducted by the federal and state agencies mentioned above. The model also utilizes available information on lobster population biology and dynamics coming from longstanding research programs focused on its life history and ecology.

Stock Indicators

In addition to standard model-based fishing mortality and abundance estimates, a number of empirical stock indicators are examined to judge stock status. These indicators provide information about the overall health of the stock independent of the assessment model. Three categories of indicators are generated: mortality, abundance, and fishery performance. The annual status of each indicator time series is characterized as positive (> 75th percentile), neutral (between 25th and 75th percentile), or negative (< 25th percentile). Fishery performance indicators are classified in the same manner as abundance indicators, with the exception of the number of traps fished and set over days, which are classified like a mortality indicator (i.e. < 25th percentile is positive and > 75th percentile is negative). For all indicators, the terminal six-year average (2008 - 2013) is used to assess the status relative to the 1982-2003 reference time period. The strengths of this approach are that the use of quartiles is objective and the focus on trends is straight-forward and free of modeling assumptions.

Stock Definitions

In the 2009 assessment (ASMFC 2009) American lobster were assessed as three distinct stocks; the GoM, Georges Bank (GBK), and Southern New England (SNE). Stocks for American lobster were differentiated on the basis of multiple factors including; regional rates of maturity and growth, size distribution, distribution and abundance trends of adults and juveniles, patterns of migration, location of spawners, the dispersal and transport of larvae, and considerations for large scale patterns in physical oceanographic processes (temperature regime and currents).

A primary consideration for stock differentiation in the last stock assessment was evidence of the relative importance of inshore/offshore connectivity and individual movement rates along the coastline and continental shelf. However, due to population increases and shifts in size compositions in the GoM over the intervening years, it has become evident from both survey data and model performance that migrations of large female lobsters between the GoM and GBK stock areas are sufficiently common to complicate the assessment of either of these stock areas in isolation from the other.

The accumulation of large female lobsters from the GoM is most apparent when viewed as the combination of GoM and GBK. It appears that the GOM is effectively a source of large females, and GBK is a seasonal sink for them. This has likely always been the case, however it has now become more evident with the large-scale increase in this demographic within the lobster population. These empirical data and model results provide compelling evidence that there is a significant seasonal migration of large female lobsters between the GoM and GBK and that this dynamic justifies these stocks be combined into one stock. For the 2015 assessment, results were provided for GoM, GBK, SNE and for GoM/GBK combined. While this proposal to combine GoM/GBK into a single stock may have to be considered in any future MSC assessment/evaluation of GoM lobsters, in the present report results for the GoM stock are considered.

4.3.2. GoM Lobster Stock status

Catches

Traps are the predominant gear type in the U.S. lobster fishery, accounting for an average of 96% of the total landings between 1981 and 2013. Other gears accounting for the remainder include otter trawl, gill net, and dredge. There is a lobster recreational fishery that generally amounts to less than 1% of total landings by state.

Landings in the GoM were stable between 1981 and 1989 averaging 14,600 metric tons (mt), and then increased steadily from approximately 20,000 mt in early 1990s to approximately 35,000 mt in the mid-2000s (Table 1). From 2007 to 2013 landings nearly doubled, reaching the time series high of 64,087 mt in 2013. Ten of the 11 highest lobster landings recorded in the GoM stock have occurred since 2003. Annual GoM landings have been in the upper quartile of the time series (1982-2013) since 2007. Relative to the low but stable landings of the 1950 to late 1980s period increases during the recent period have been dramatic and likely associated with an environmental-ecological regime shift favouring high recruitment.

Table 1. Gulf of Maine landings in metric tons by state from 1981 to 2013. MA: Massachusetts; ME: Maine; NH: New Hampshire; RI: Rhode islands. Source: ASFMC 2015.

Year	ME	NH	MA	RI	Total
1981	10,266	360	4,152	0	14,777
1982	10,310	366	3,992	0	14,669
1983	9,836	594	4,638	0	15,069
1984	8,866	712	4,219	0	13,797
1985	9,129	539	4,890	0	14,558
1986	8,935	427	4,454	0	13,816
1987	8,958	570	4,425	0	13,952
1988	9,861	508	4,328	0	14,696
1989	10,600	649	5,459	0	16,708
1990	12,732	752	5,761	0	19,245
1991	13,966	817	5,420	13	20,216
1992	12,170	694	4,875	0	17,738
1993	13,575	673	4,554	1	18,802
1994	17,667	596	5,392	0	23,655
1995	16,878	710	5,375	0	22,962
1996	16,367	628	5,127	0	22,122
1997	21,330	544	4,750	0	26,624
1998	21,336	460	3,973	0	25,769
1999	24,265	525	5,115	0	29,905
2000	25,924	658	5,208	0	31,797
2001	22,053	780	3,664	0	26,497
2002	28,860	781	4,158	0	33,800
2003	24,935	682	3,506	6	29,129
2004	32,466	968	3,553	34	37,021
2005	31,176	622	3,227	33	35,058
2006	32,961	680	3,573	83	37,297
2007	28,645	720	3,266	69	32,700
2008	31,710	831	3,656	55	36,252
2009	36,828	1,049	4,052	78	42,008
2010	43,654	1,225	4,153	75	49,107
2011	47,590	1,381	4,458	91	53,521
2012	57,446	1,554	4,828	108	63,936
2013	57,797	1,213	5,031	45	64,087
1981 to 2007 mean	17,928	630	4,483	9	23,051
2008 to 2013 mean	45,837	1,209	4,363	75	51,485
6 yr. % change from mean	155.67%	91.85%	-2.68%	753.12%	123.35%

Stock Indicators

Mortality

Exploitation rate is used as an indicator of mortality. Annual exploitation rates from 2008-2013 are mostly positive.

Abundance

Four indicators are used to assess relative abundance, total spawning potential, and year class strength of each stock. These include: spawning stock biomass index, recruit abundance, full-recruit abundance, and an index of larval production or young-of-year (YOY) settlement. For 2008-2013, mean spawning stock abundance indicators are positive and mean full recruit and recruit abundance indicators are mostly positive with some neutral (Figure 4). Young-of-year indices appear to be trending down. The 2008-2013 mean is mixed: positive in two regions, neutral in two, and negative in one. In 2013, three of the five regions were negative. YOY catch rates in the early to mid-2000s were

generally neutral or positive. This recent pattern of low settlement indicates a potential for declines in recruitment in future years.

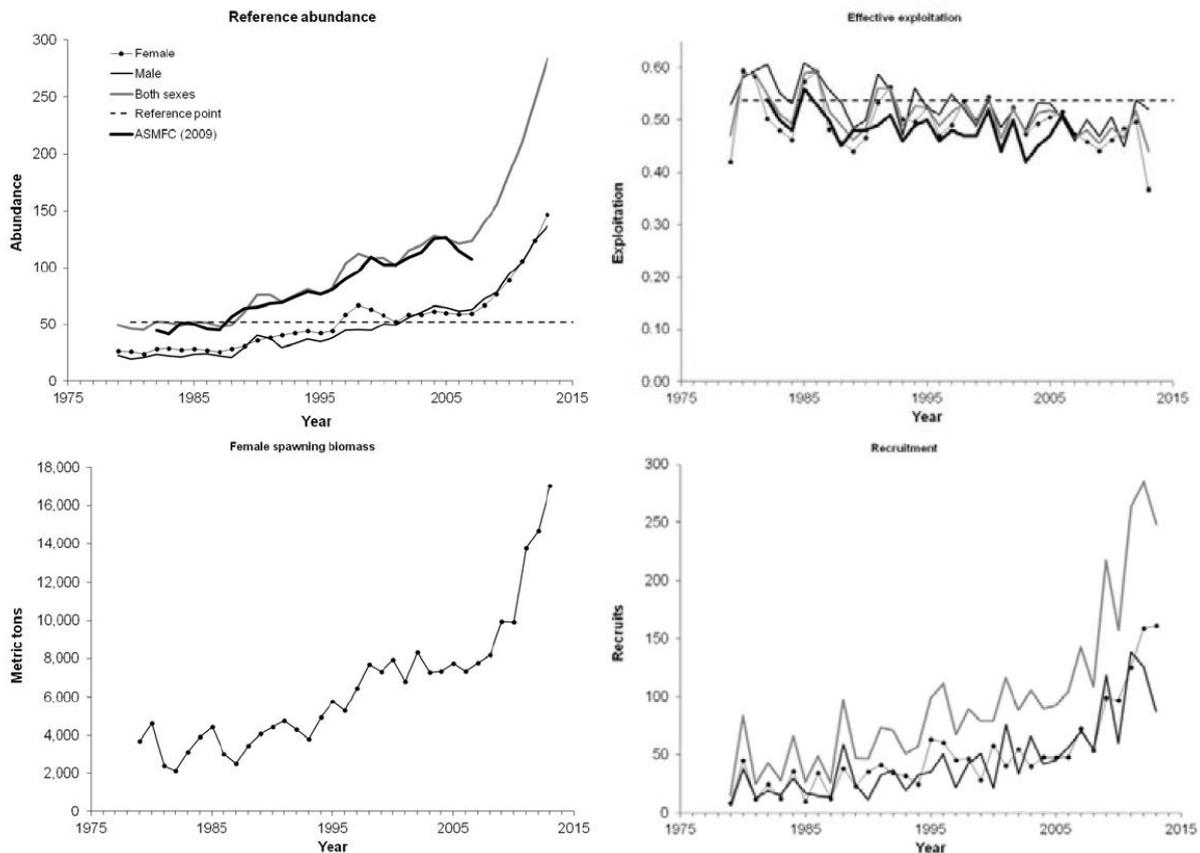


Figure 4. Annual reference abundance, effective exploitation, spawning biomass, and recruitment estimates for American lobster from 1979-2013 from the basecase model for GOM and from 1982-2007 from ASMFC (2009). Horizontal lines show threshold reference points at the 25th percentile (reference time period 1982-2003) for abundance and the 75th percentile for effective exploitation. Source: ASMFC 2015.

Fishery Performance

Eight indicators are used to describe the performance of the fishery: effort (number of traps), total landings, partial landings (from those sources for which effort data were available), gross CPUE (partial landings/traps), price per pound, gross stock revenue and revenue per trap. Fishery performance indicators were classified in the same manner as abundance indicators, with the exception that the number of traps fished and set over days were classified like a mortality indicator. Several of these indicators have been positive for recent years: average landings, CPUE, revenue and revenue per trap were all positive based on the mean for 2008-2013. Effort (number of traps reported) has been high and negative since 2001, although recent values are lower than earlier in the 2000s. The mean time lobster pots sit in the water between hauls, expressed as set-over-days, has increased in recent years and mean values for 2008-2013 are negative. Additionally, the price paid to fishermen per pound adjusted to unprocessed fish CPI is negative.

Stock Status

The GoM lobster stock is not depleted. The reference 2011 to 2013 abundance was 247 million lobsters, which is well above the threshold abundance of 52 million lobsters and the target abundance

(75th percentile) of 103 million lobsters. Neither is overfishing occurring. The reference effective exploitation (2011-2013) was 0.48, which is below the threshold of 0.54 (Figures 4 and 5).

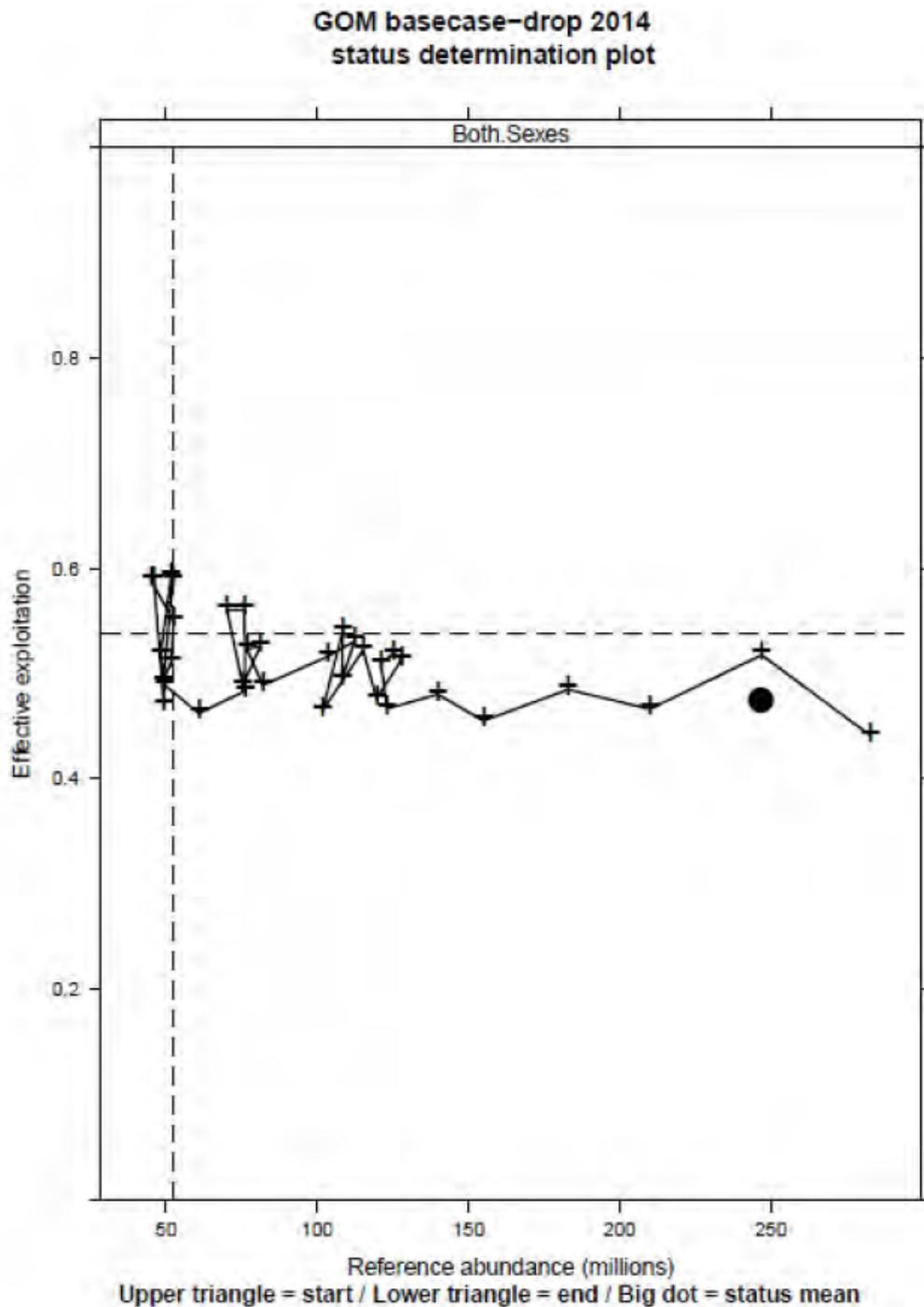
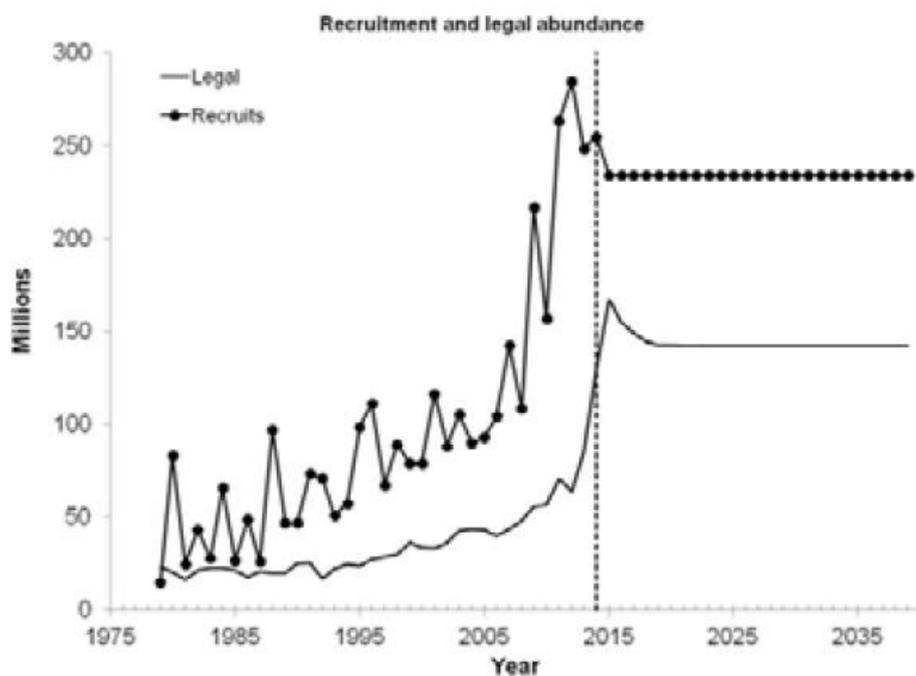


Figure 5. Reference abundance and effective exploitation estimates for 1979-2013 from the basecase University of Maine assessment model for GoM lobster. The dashed lines show the current reference points calculated as the 25th percentile of reference abundance and the 75th percentile of effective exploitation based on the 1982-2003 reference period. The circle shows mean reference abundance and effective exploitation during 2011-2013. Source: ASMFC 2015.

Outlook

Projection runs using the basecase model run for GoM and one hypothetical scenario are used to demonstrate analyses that can be carried out using the University of Maine assessment model, although projection results were not used elsewhere in the 2015 assessment. The demonstration runs address the question of what lobster stocks might look like in the future if fishing mortality, fishery selectivity, natural mortality, recruitment, etc. remained constant at current levels with no variability due to environmental conditions. The projections should not be viewed as estimates of future stock size in any particular year and are meant only to give readers a feeling for average potential stock productivity in a hypothetical world where factors affecting lobster dynamics are near current average levels with no variability.

Results suggest that stock abundance and productivity would decline but remain relatively high after 2013 under the assumed conditions for GoM (Figures 6). Projections through 2017 are affected by the unusually high recruitment estimates for 2011-2014.



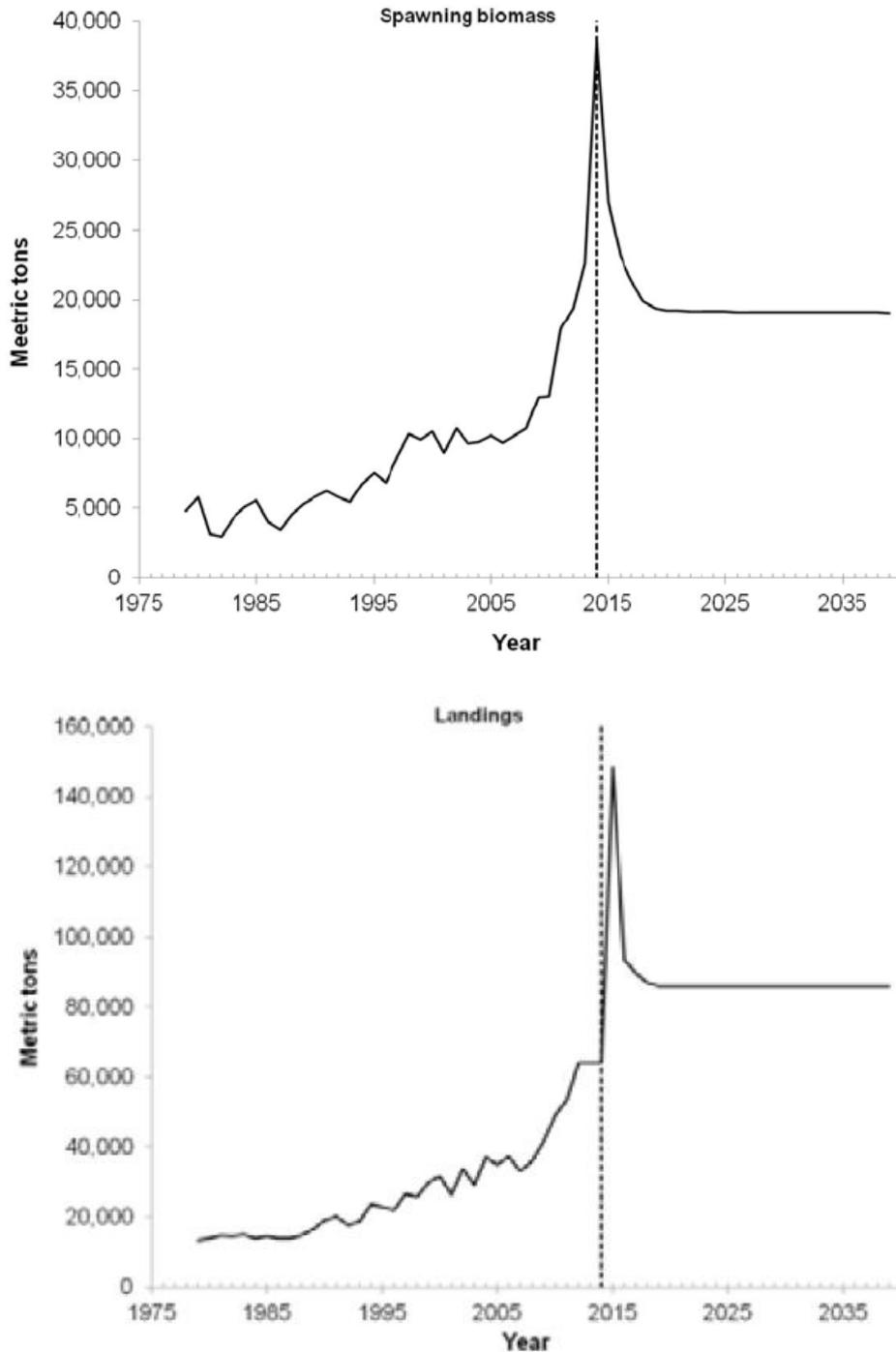


Figure 6. Basecase assessment model estimates for 1979-2014 with projected recruitment, legal abundance, spawning biomass and landings for GoM lobster from 2015-2039. This scenario is designed to provide a rough idea of equilibrium average productivity levels that might exist if current recruitment and fishing mortality levels continue into the future. The projections assume that natural mortality and fishery selectivity during 2015-2039 are the same as in 2014 and that fishing mortality and recruitment are the same as averages during 2009-2013. Basecase estimates for 2014 are not reliable so projected dynamics from 2014 through about 2020 should be ignored (only equilibrium levels after 2020 are of interest). Vertical lines separate basecase estimate and projections. These results are for demonstration purposes only and should not be used for management. Source: ASMFC 2015.

4.3.3. Uncertainties

Sensitivity analyses are the primary measure of uncertainty in the assessment. In lieu of conventional uncertainty calculations, the range of estimates from sensitivity analysis was used to characterize uncertainty in reference abundance and effective exploitation.

Sensitivity analysis included a “standard” set of runs that were carried out with the basecase model (Figures 7 and 8). The standard set consisted of runs with: $M \pm 0.05$, recruit covariates turned off, the growth matrix from the last assessment (which gives faster growth), gear selectivity shifted forward (to the right) and backward (to the left) by one size group (5 mm CL), linear catchability for all surveys, and conservation selectivity from the last assessment. Sensitivity analyses designed to address specific issues were also used to describe uncertainty where appropriate.

GOM sensitivity analyses

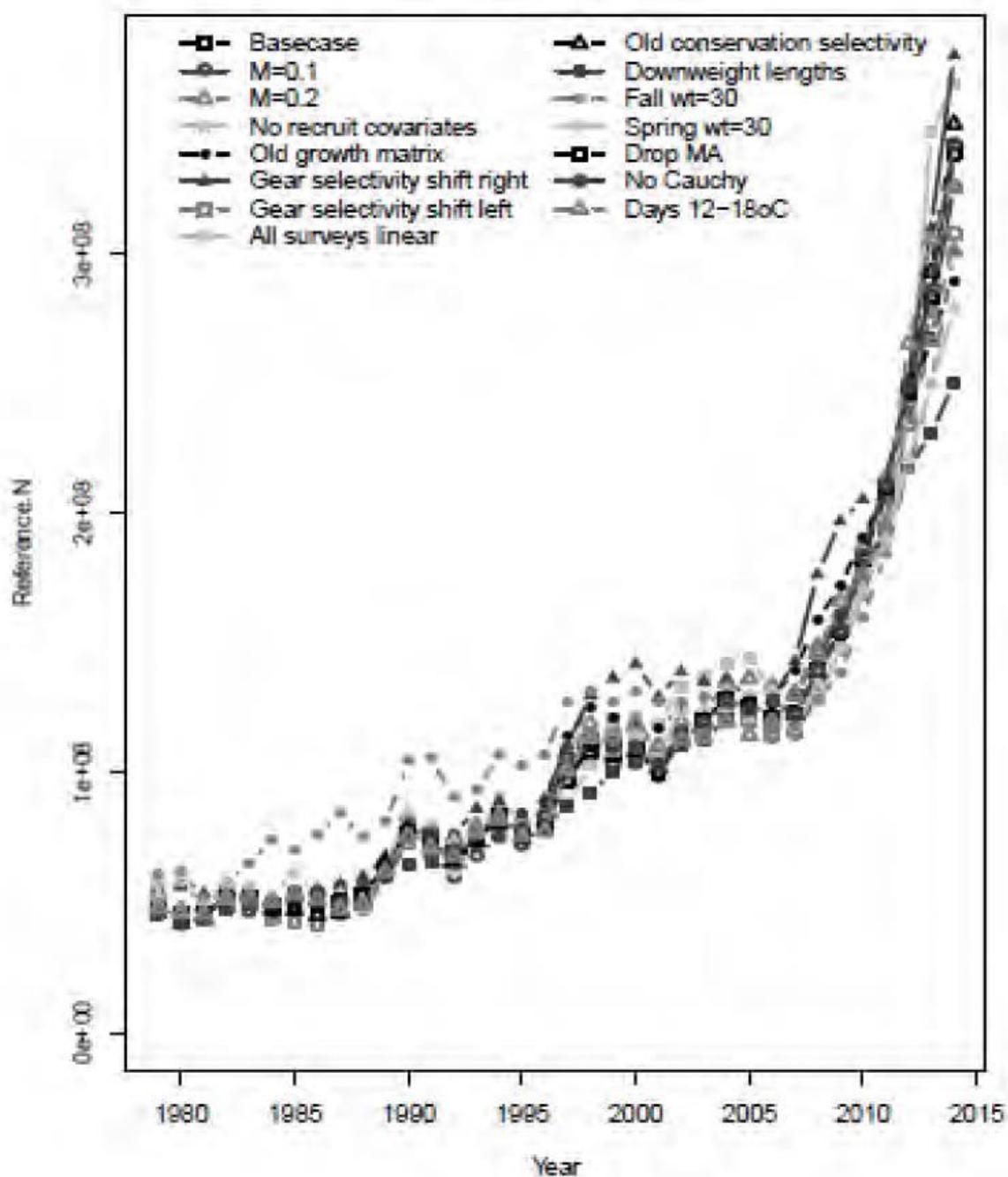


Figure 7. Annual reference abundance estimates for GOM lobster from 1979-2013 from the basecase and sensitivity model runs. Source: ASMFC 2015.

GOM sensitivity analyses

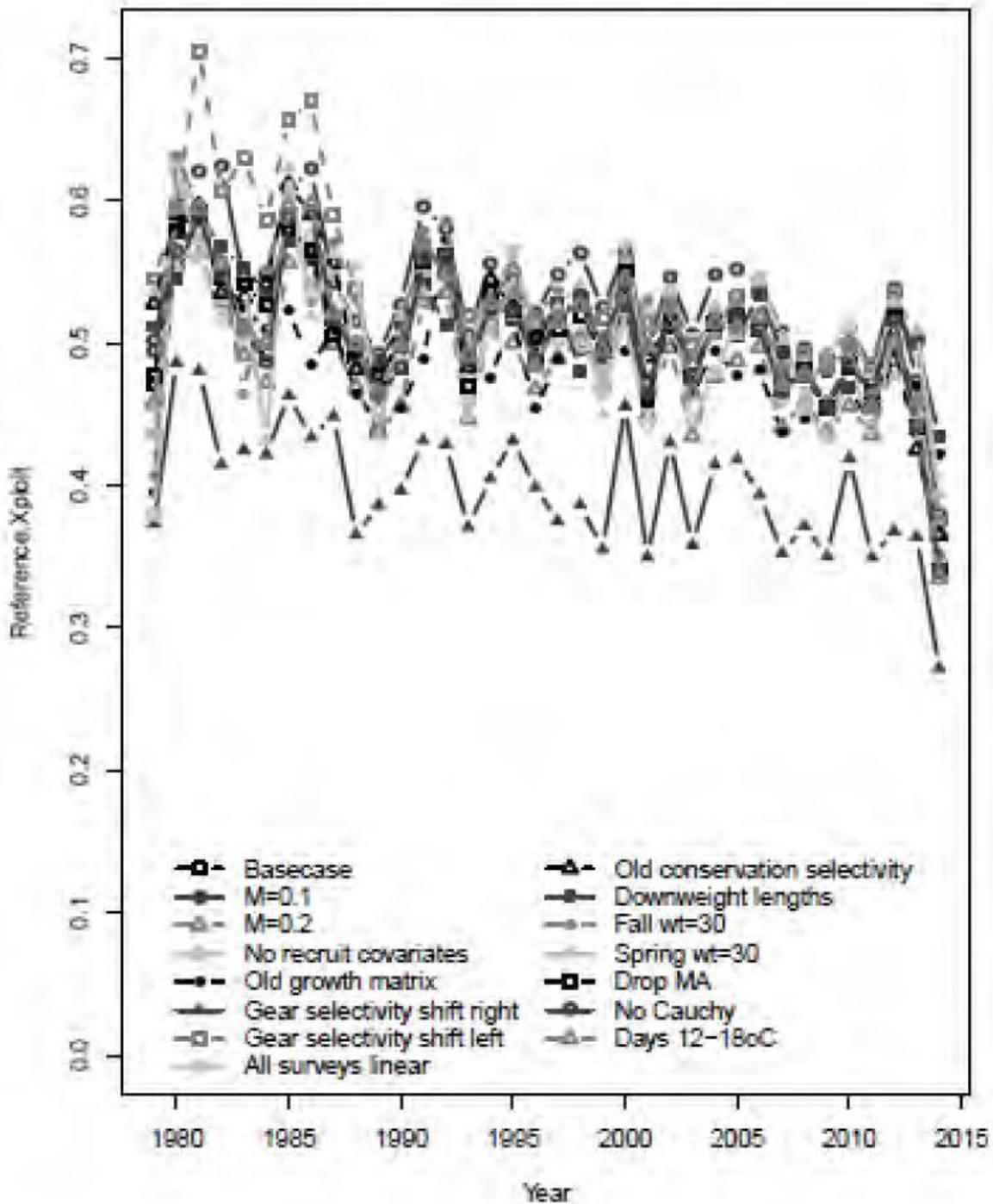


Figure 8. Annual effective exploitation estimates for GoM lobster from 1979-2013 from the basecase and sensitivity model runs. Source: ASMFC 2015.

The assessment also included a likelihood profile analysis to examine the effects of variation in average recruitment over a range from 0.8 to 1.2 times the basecase level (Figure 9). The purpose of this analysis is to determine which data sets in the model support abundance estimates for recent years that are higher or lower than basecase estimates and to understand how each data set affects model results. Profile runs were not included in the set of standard sensitivity runs used to characterize uncertainty.

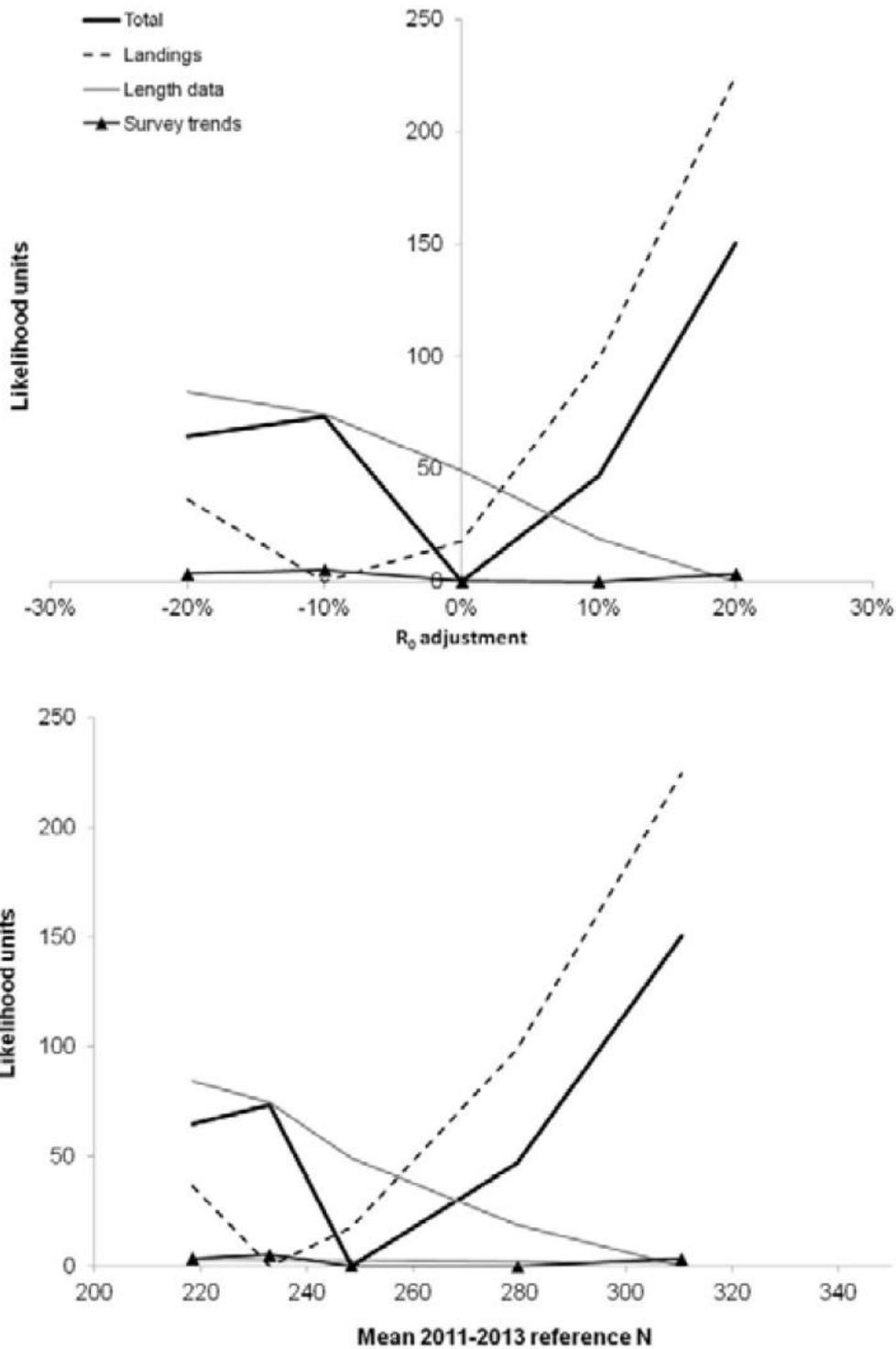


Figure 9. Summed likelihood profile results over a range of values for the mean log recruitment parameter (R_0) for female and male lobsters in the GoM stock area (top). An R_0 adjustment of 10%, for example, means that mean recruitment was fixed at a level about 10% higher than in the basecase model run. Mean reference N along the x-axis of the lower panel is the average reference abundance during 2011-2013 estimated from the corresponding run at the same position in the upper panel (bottom). Source: ASMFC 2015.

Fishery selectivity, natural mortality and growth parameters were not estimated in the model and this probably contributes to underestimation of uncertainty in model results. However, an analysis of

likelihood profile results strongly suggests that conflict between landings and length composition data stemming from problems with growth estimates are important. Inaccurate growth assumptions are the most likely cause of the problems in fitting size composition data for large lobsters. Thus, the apparent certainty in model results appears to be a geometric side effect of errors in growth assumptions. These results suggest that growth is the most important uncertainty in using the University of Maine assessment model for lobsters.

Basecase reference abundance and effective exploitation estimates in the 2015 assessment and estimates from ASMFC (2009) were compared to evaluate the historical stability of assessment estimates over time. Stability in scale (the level of estimated abundance and exploitation) and trend (changes over time) were evaluated, although only trends are used for status determination. The basecase model was rerun sequentially omitting one year of data to evaluate the stability of the basecase model. The rho statistic, which measures the average relative difference between basecase estimates and terminal estimates for the same year from a retrospective run, and standard plots were used to quantify retrospective patterns in reference abundance and effective exploitation estimates from the basecase model. Results indicate a mild retrospective pattern in the basecase model, suggesting that the estimated trend and scale for recent years are stable (Figures 10 and 11).

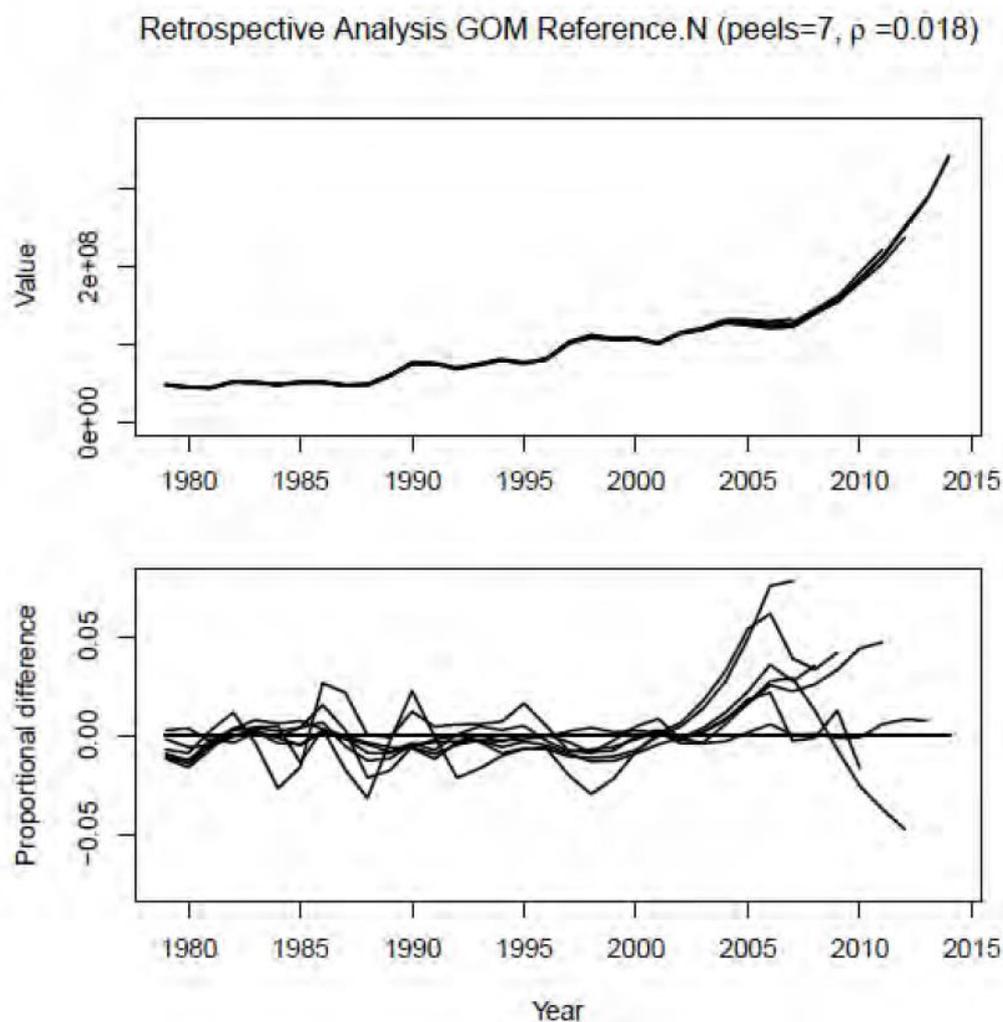


Figure 10. Retrospective analysis for GoM lobster reference abundance estimates from the preliminary basecase model. Source: ASMFC 2015.

Retrospective Analysis GOM Reference.Xploit (peels=8, $\rho = -0.019$)

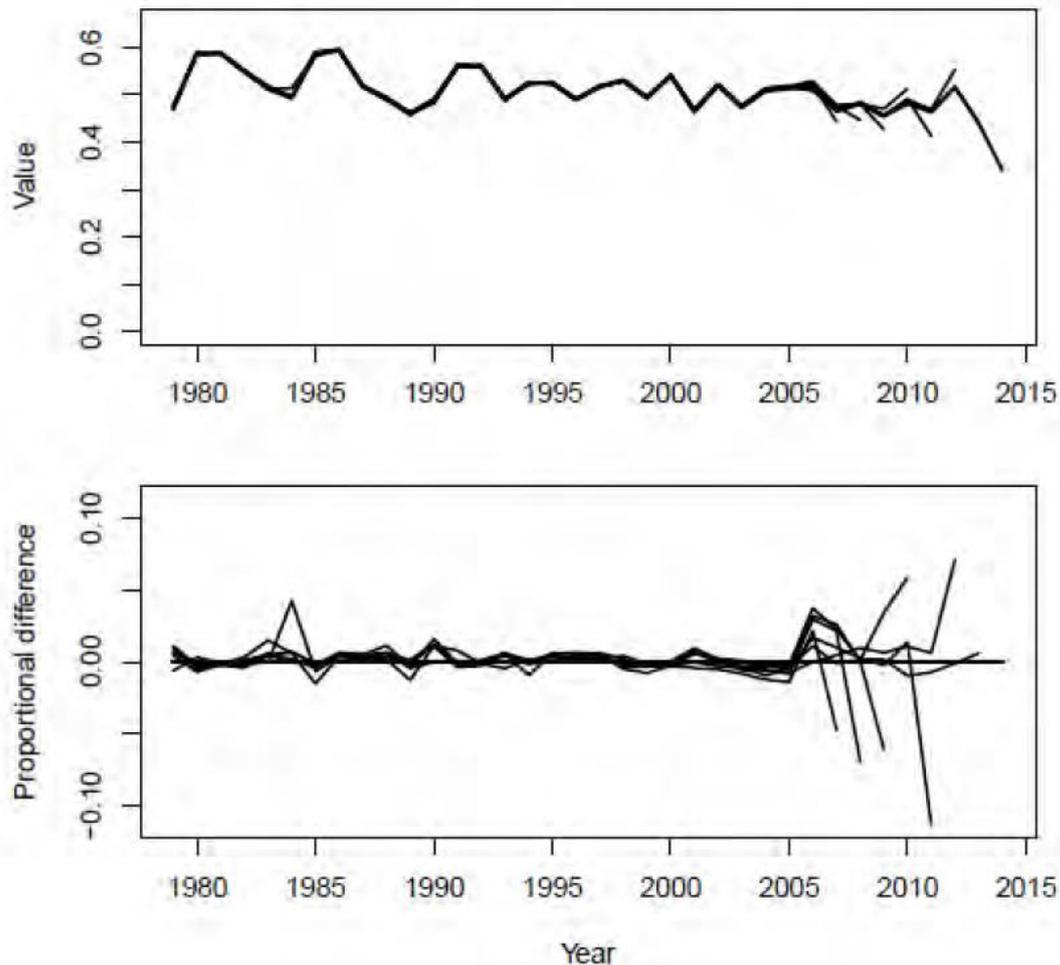


Figure 11. Retrospective analysis for GoM lobster effective exploitation estimates from the preliminary basecase model. Source: ASMFC 2015.

4.3.4. Reference points

In the 2006 assessment of the GoM, GBK and SNE lobster, the stock status was determined by comparison of average F and average abundance during the most recent three years to stock-specific median values. Median abundance and median fishing mortality over stock-specific fixed time periods were used as threshold reference points. Based on these reference points, “overfishing” was occurring if the average fishing mortality rate for the three most recent years was higher than the median threshold and a stock was “depleted” if average abundance for the three most recent years fell below the median threshold level. In either of these cases, corrective management action should be implemented.

In the 2009 assessment, revised reference points were developed which intended to more clearly depict the current and historical status of the three lobster stocks. A goal of the 2009 assessment was to alleviate problems created by the use of annual instantaneous fishing mortality rates applied to a model-estimated fishable abundance. Changes in the minimum legal size, gear regulations and v-notching have changed the selectivity patterns of the various fisheries at differing times and have undermined the reliability of the model estimates of fishable abundance for each stock.

Revised reference points for the 2009 assessment included median reference abundance and median exploitation rate thresholds for sexes combined over the fixed time period of 1982-2003 in GoM and GBK and 1984-2003 in SNE. Stock status was determined by comparing the average reference abundance and average exploitation rate for sexes combined during the most recent three years to stock-specific threshold values.

The 2009 Assessment Peer Review Panel rejected the limit reference points recommended by the TC that were based on median values. Median values calculated from empirical data were considered inappropriate as limit reference points. They recommended recasting the median reference abundance and the median exploitation rate as target reference points. The Panel further recommended that the threshold reference point for determining whether a stock is overfished should be one-half the median reference abundance and the threshold reference point for determining whether overfishing is occurring should be the 90th percentile of the distribution of exploitation rates. The panel noted that the trend-based reference points are acceptable interim measures until more defensible, biologically-based reference points can be developed.

In January of 2010 the Gulf of Maine Lobster Foundation held a lobster summit. The group focused on a proposed solution creating a more traditional threshold and target but applying the “stop light approach” to managing towards them. The proposed solution created a more conservative standard as a threshold and a target higher than those previously considered. The proposed solution is use of the 25th and 75th percentiles which have statistical properties, meaning that there will always be observed values above and below the target and threshold.

The following reference points, intended as interim until biological based reference points can be developed, were adopted. “Reference abundance” and “effective exploitation” would be the primary descriptors of annual abundance and annual fishing pressure (N and F reference point). Reference abundance is the number of lobster 78+ mm CL on January 1 plus the number that will molt and recruit to the 78+ CL group during the year. The 78 mm CL size was chosen because it is the lower end of the model size group that contains the lowest minimum legal size (81 mm or 3 ¼ inches) in all three stocks. Effective exploitation is the annual catch in number divided by the reference abundance.

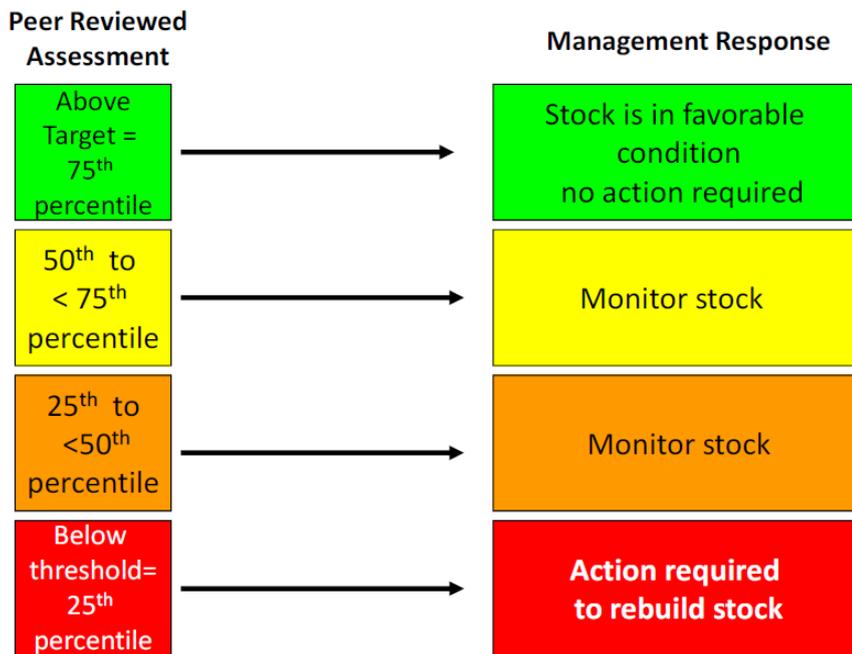
Addendum XVI to the American Lobster Management Plan (May 2010) established a four-tiered approach to define abundance reference points in the GoM and GBK, a four-tiered approach to define exploitation reference points for all three stock units, and a three-tiered approach to define abundance reference points for SNE. This approach is fully described in TC Memo 10-034. The Board set the SNE abundance reference points to a lower target level than the GoM and GBK stocks because it believes the SNE stock has limited ability to rebuild to higher historical levels. Members of the Board believe that environmental and ecosystem changes have reduced the resource’s ability to rebuild to historical levels.

Abundance Reference Point

For the GoM and GBK Stocks

A stock is considered below the limit reference point (threshold), and overfished, if model abundance is less than the 25th percentile (in the lowest quartile, the red zone of table 1) relative to the 1982-2003 reference period. Immediate action would be required if a stock were to fall below the 25th percentile. If the stock abundance is at or above the 75th percentile (green), a stock is considered in favorable condition.

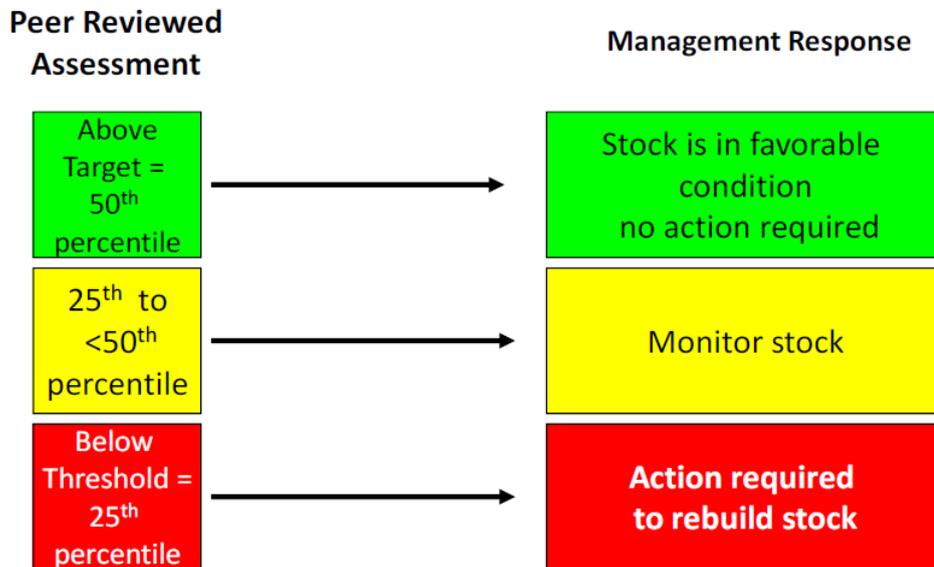
Table 1. GOM and GBK Abundance Reference Point



For the SNE Stock

The SNE stock is considered below the limit reference point (threshold), and overfished, if model abundance is less than the 25th percentile (in the lowest quartile, the red zone of table 2) relative to the 1982-2003 reference period. Immediate action would be required if a stock were to fall below the 25th percentile. If the stock abundance is at or above the 50th percentile (green), a stock is considered in favorable condition.

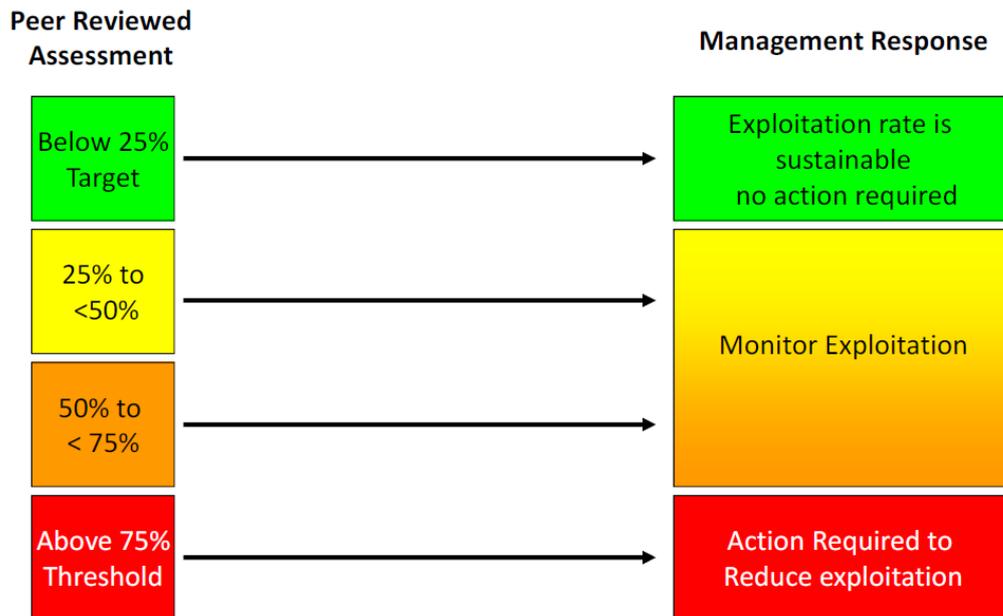
Table 2. SNE Abundance Reference Point



Exploitation Reference Point

The exploitation reference point is designed to be a conditional target as exploitation has remained relatively stable in all areas over a wide range of abundance during the reference periods. The exploitation reference point is the same for all three stocks. A stock is considered above the limit reference point (threshold), and overfishing is occurring, if exploitation is greater than the 75th percentile relative to the reference period (GoM and GBK: 1982-2003; SNE: 1984-2003). Immediate action would be required if exploitation were to exceed the 75th percentile. If the stock exploitation is at or below the 25th percentile (green), a stock is considered in favorable condition.

Table 3. Exploitation Reference Point for all 3 Stocks



Reference point issues were addressed in considerable, further detail in the 2015 assessment. The main disadvantage of effective exploitation rates is that they depend on both recruitment and fishing pressure. In particular, effective exploitation rates will increase or decrease with recruitment and the abundance of lobsters between 78 mm CL and the minimum legal size. An increase in effective exploitation accurately reflects deteriorating conditions for the stock but may be due to low recruitment instead of increased fishing pressure, and vice-versa. Although variability in recruitment may make effective exploitation rates highly variable, status determinations are based on percentile distributions which are much less variable than estimates for individual years. In addition, the relationship between the effective exploitation rate and instantaneous fishing mortality rate will differ between the sexes because management measures differentially affect fishery selectivity and fishable abundance by sex (i.e. discard of v-notched or ovigerous females). The relationship will change over time as new management measures affecting fishery selectivity are introduced or as natural mortality varies. Exploitation rates for combined sexes may exclude important information about stock status for lobster, specifically very high exploitation rates on males. In all cases, however, the effective exploitation rate measures the practical effects of fishing pressure in a consistent manner using a summary statistic that ranges from zero to one.

Point estimates of effective exploitation and reference abundance from the University of Maine (UM) assessment model are more reliable as trend indicators than as estimates in absolute terms. For example, a change in effective exploitation from 0.2 to 0.4 would indicate that the variable in question doubled but would not necessarily indicate that either 0.2 or 0.4 was a reasonable estimate of the underlying true values. Uncertainties in estimates and/or reference points stem from several sources including growth parameters, natural mortality and recruitment dynamics at low or high stock sizes.

The 2015 assessment explored several analyses to better characterize the inherent variance in growth and natural mortality rates which affect abundance and mortality estimates. In view of these issues, the UM model was used to evaluate stock status relative to trends during a reference period for each stock, but not relative to absolute abundance or exploitation-based reference points (e.g. B_{msy} or $F10\%$). The trend based reference points for lobster have proven robust over a wide range of assumptions about natural mortality and do not depend on the estimated scale of model estimates.

However, the disadvantage of using trend based reference points is that there is no guarantee that percentile conditions in the early 1980s through 2003 are equally optimal threshold and target values for all three lobster stocks. The reference period used in the assessment (1982-2003 for GoM and GBK; 1984-2003 for SNE) is a relatively short time series and may not reflect an optimal and sustainable production range for each stock.

The Technical Committee considered a suite of standard and often-used biological reference points for lobster. These included F5%, F10%, F15%, F20%, FMAX, and F0.1 which were calculated using the UM model. These per-recruit reference points assume equilibrium conditions such as a constant rate of growth and a constant rate of natural mortality. The current rate of exploitation in the Gulf of Maine stock and the Gulf of Maine/Georges Bank combined stock are above threshold levels for the entire suite of per-recruit reference points estimated. By these metrics, overfishing is occurring in both the GOM and GOM/GBK stock. This seems implausible given the record abundance and recruitment observed in this stock over the last 20 years. Per-recruit reference points were not calculated for GBK because the model used to calculate them was not accepted for management use. The Review Panel, in fact, considered these per-recruit mortality-based reference points to be meaningless and possibly misleading.

Uncertainty about the scale of fishing mortality estimates makes the use of absolute overfishing reference points problematic. This assessment demonstrated a strong relationship between annual recruitment and temperature thresholds defining optimal and stressful environmental conditions. These temperature regimes have undergone substantial systematic changes which directly affect natural mortality, rate of maturation, and rate of growth. Climate projections for the Northeast shelf predict that a continuation of environmental variability is a reasonable expectation. Therefore reference points that are based on hypothetical equilibrium conditions become unrealistic and unreliable management tools. An estimate of 100% MSP based on past data has little relevance to current or future conditions. As such the TC did not recommend the use of any of the biological based reference points.

The Review Panel agreed with the SASC that traditional reference points, based on yield and spawning biomass per recruit and based on MSY considerations, are not appropriate given the life history and recruitment trends of lobster, and the current configuration of the per-recruit model. Instead, the Panel agreed with the choice of selected trend-based abundance and exploitation reference points determined from the model for an appropriate time period.

The Panel agreed that the GoM/GBK combined stock is not overfished and overfishing is not occurring. This is clearly shown by both the model results and the stock indicators. (Separate determinations for GOM and GBK were not deemed appropriate by the SASC and the Panel)

4.3.5. Harvest Strategy, Harvest Control Rules and Tools

The management unit for American lobster is the entire Northwest Atlantic Ocean and its adjacent inshore waters where lobster is found from Maine through Virginia. The ASMFC manages the lobster fishery in state waters (0-3 miles from shore) and the NMFS manages the lobster fishery in federal waters (3-200 miles from shore), both under the authority of the Atlantic Coastal Fisheries Cooperative Management Act. The Interstate Fishery Management Plan (IFMP) is written to provide for the management of lobsters throughout their range. The IFMP is designed to specify a uniform program regardless of lines that separate political jurisdictions, to the extent possible. The different management authorities are expected to take necessary actions to apply the provisions of the IFMP in waters under their respective jurisdictions. For management purposes, the management unit is subdivided into seven LCMAs that cut across stock boundaries in many cases and do not necessarily

correspond to stock assessment units. The ASMFC coordinates the efforts of the states and the federal government. It decides upon a management strategy and then forwards that strategy to the states and Federal government along with a recommendation for action.

The ASMFC American Lobster Management Board approved Amendment 3 to the IFMP in December of 1997. The plan is designed to minimize the chance of population collapse due to recruitment failure. The goal of the amendment is to have a healthy American Lobster resource and management regime, which provides for sustained harvest, maintains appropriate opportunities for participation, and provides for cooperative development of conservation measures by all stakeholders. To achieve this goal, the plan adopts the following objectives:

1. Protect, increase or maintain, as appropriate, the brood stock abundance at levels which would minimize risk of stock depletion and recruitment failure;
2. Develop flexible regional programs to control fishing effort and regulate fishing mortality rates;
3. Implement uniform collection, analysis, and dissemination of biological and economic information; improve understanding of the economics of harvest;
4. Maintain existing social and cultural features of the industry wherever possible;
5. Promote economic efficiency in harvesting and use of the resource;
6. Minimize lobster injury and discard mortality associated with fishing;
7. Increase understanding of biology of American lobster, improve data, improve stock assessment models; improve cooperation between fishermen and scientists;
8. Evaluate contributions of current management measures in achieving objectives of the lobster FMP;
9. Ensure that changes in geographic exploitation patterns do not undermine success of ASMFC management program;
10. Optimize yield from the fishery while maintaining harvest at a sustainable level;
11. Maintain stewardship relationship between fishermen and the resource.

The comprehensive assessment of stock status conducted at 5-year intervals provides the basis for review and evaluation of the overall harvest strategy.

Amendment 3 established a framework for area management, which includes industry participation through seven Lobster Conservation Management Teams (LCMT) made up of local fishing industry representatives. LCMTs are encouraged to develop area-specific management recommendations that address the specific needs of their area (LCMA) and fisheries. The ASMFC Lobster Management Board considers these recommendations when pursuing the objectives of the IFMP. The Board is also supported by and receives recommendations from a Technical Committee, a Stock Assessment Committee, an Advisory Panel, and a Plan Review Team.

The specifics of management measures vary between LCMA's. Effort is controlled by way of limited access licenses and trap limits, with maximum trap sizes and requirements for gear identification, escape vents and ghost panels. The main conservation measures include restrictions on harvest of lobsters smaller than minimum and larger than maximum carapace lengths, protection of berried (ovigerous) females and mandatory/voluntary practice of v-notching berried females.

Specific measures are implemented by way of Addenda to Amendment 3. Conservation related measures for LCMA 1 are summarized in Table 2.

Table 2. Management measures for LCMA 1.

Min gauge size	Vent rect.	Vent cir.	V-notch requirement	V-notch definition (possession)	Max. gauge (male % female)	Season closure
3-1/4"	1-15/16x 5-3/4"	2-7/16"	Mandatory for all eggers	Zero tolerance	5"	No

A v-notched lobster is defined as any female lobster that bears a notch or indentation in the base of the flipper that is at least as deep as 1/8 inch, with or without setal hairs. It also means any female which is mutilated in a manner that could hide, obscure, or obliterate such a mark.

Addendum XVI to the American Lobster Management Plan (ASMFC 2010a) established a four-tiered approach to define abundance reference points in the GoM and GBK, a four-tiered approach to define exploitation reference points for all three stock units, and a three-tiered approach to define abundance reference points for SNE. This approach is fully described in TC Memo 10-034 (ASMFC 2010b).

Goals of the IFMP are stated further in Addendum XVI. First, to optimize yield from the fishery while maintaining harvest at a sustainable level. The maximum fishing mortality threshold (F_{msy}) or a reasonable proxy may be defined as a function of (but not limited to): total stock size (abundance or biomass), spawning stock size (abundance or biomass), exploitable stock size (abundance or biomass), total egg production, or egg per recruit, and may include males, females, both, or combinations and ratios thereof which provide the best measure of productive capacity. Exceeding the established fishing mortality threshold constitutes overfishing as defined by the FMP. Second, to maintain a minimum stock size threshold or $\frac{1}{2}$ BMSY (or a reasonable proxy thereof) at levels which would minimize risk of stock depletion and recruitment failure. The minimum stock size threshold ($\frac{1}{2}$ BMSY) or a reasonable proxy may be defined as (but not limited to): total stock size (abundance or biomass), spawning stock size (abundance or biomass), exploitable stock size (abundance or biomass), total egg production, and may include males, females, both, or combinations and ratios thereof which provide the best measure of productive capacity. Should the measure of stock size for the stock fall below this minimum threshold, the stock is considered overfished. The definitions for status determination criteria for each stock are broadened under this option to allow for greater flexibility in incorporating changes to the definitions of the maximum fishing mortality threshold and/or target and/or minimum stock size threshold and/or target as the best scientific information becomes available. Changes to these methods could be made through a Board action following a peer reviewed stock assessment. The Board could adopt any of the advice of the stock assessment or peer review.

Technical Committee Memorandum 10-034 (ASMFC 2010b) suggested an approach similar to the "stop light approach" with functional quartiles which use the model-based abundance estimates to determine the stock status. Spawning stock and recruitment indices (based on settlement or larval surveys) will be used in addition to the model-based abundance to determine if a predetermined action trigger has been reached.

A stock is considered below the threshold, and depleted, if model abundance is less than the 25th percentile (In the lowest quartile, the red zone) relative to the 1982/84-2003 reference period. The TC recommended immediate substantial action to have the highest likelihood of increasing the stock abundance in the shortest amount of time. Falling into the red zone shall trigger at minimum a 50% reduction in harvest.

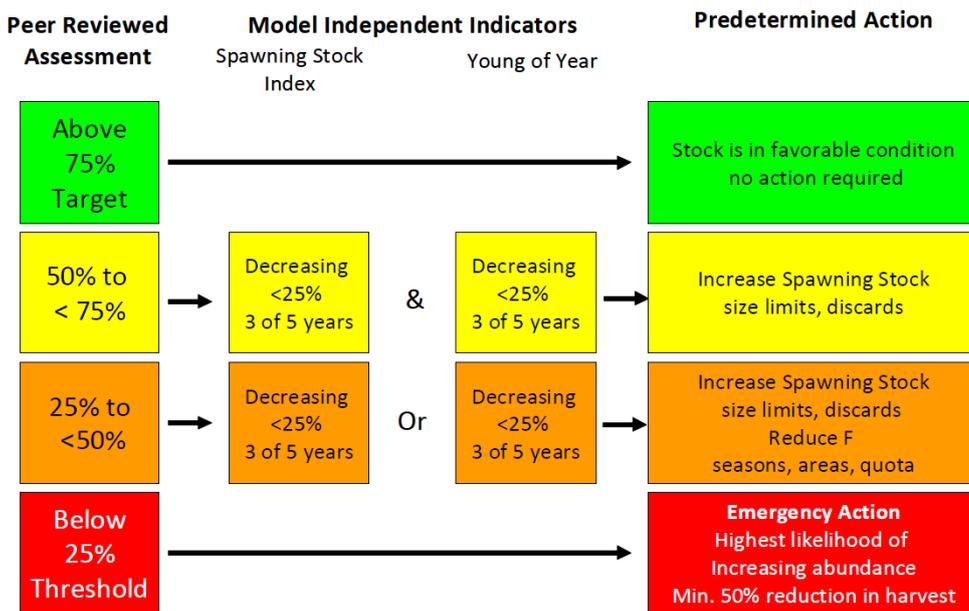
If model abundance falls above the 25th but less than the 50th percentile (Orange) and spawning stock or recruitment indices are below the 25th percentile in three of the last five years, management action

would be triggered. At this point the Board shall take action to increase the spawning stock by adjusting size limits and discards, and reducing fishing mortality by implementing harvest controls.

If model abundance falls above the 50th but less than the 75th percentile (yellow) and spawning stock and recruitment indices are below the 25th percentile in three of the last five years, management action would be triggered. At this point the Board shall take action to increase the SSB by adjusting size limits and discards.

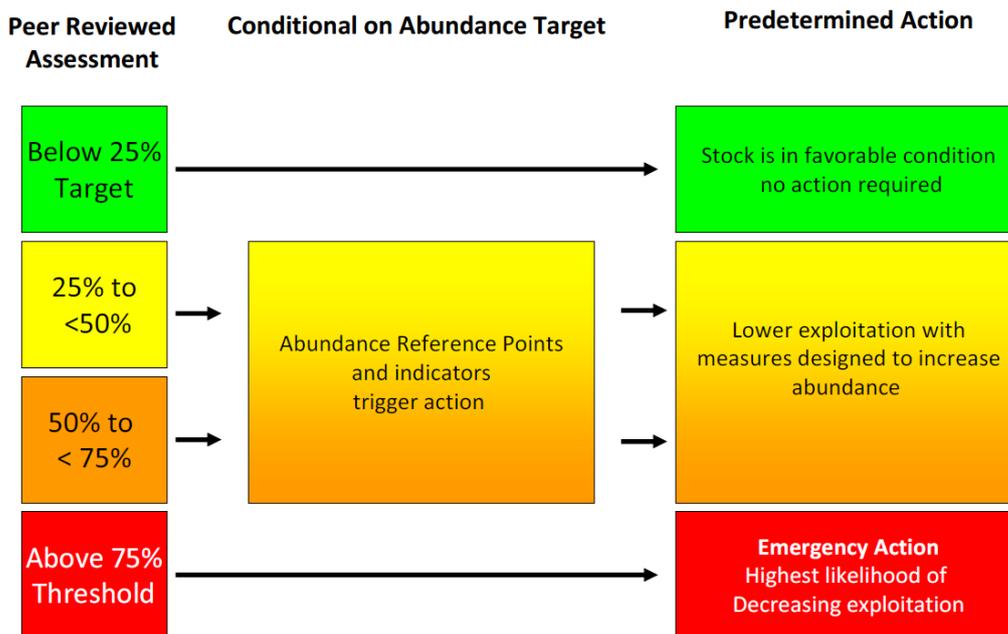
If the stock abundance is at or above the 75th percentile (green), a stock is considered in favorable condition.

Table 3. Abundance Reference Point and proposed HCRs.



The exploitation reference point is designed to be a conditional target as exploitation has remained relatively stable in all areas over a wide range of abundance during the reference period. The TC recommended that the Board only take action if exploitation falls above the 75th percentile (red zone of Table 4). Otherwise actions to reduce exploitation shall be taken when abundance is below the target as recommended in the abundance reference point in Table 3.

Table 4. Exploitation Reference Point and proposed HCRs.



The foregoing rules identify the stock or fishery attribute that will feature in the required management response. For institutional reasons they do not specify or quantify the precise regulation to be implemented, since in the US fisheries management framework these can only be implemented by consultation between managers and stakeholders on a case by case basis. These, or other comparable predetermined management responses, were not included in Addendum XVI and have not been otherwise formally adopted.

A review and evaluation of the IFMP is conducted annually by the Plan Review Team. Included are the status of assessment advice, research and monitoring, management measures and issues, updates to stock and fishery performance indicators and compliance with management measures, monitoring and reporting requirements. The PRT raises issues and makes recommendations to the Lobster management Board.

4.4. Principle Two: Ecosystem Background

List Principle 2 Species identified during Scoring Sessions	
Retained Species	<p>The State of Maine lobster licence is a combined lobster and crab licence.</p> <p>Under the federal licence, rock crab (<i>Cancer irroratus</i>) and Jonah crab (<i>Cancer borealis</i>) are allowed to be landed.</p> <p>With respect to bait used in the GoM lobster fishery, refer to section 4.4.1 Retained species.</p>
Minor Bycatch Species	<p>Some information on the nature and the amount of bycatch affected by the fishery is collected.</p> <p>Minor bycatch species are finfish species (See section 4.4.2).</p>
Major Bycatch Species	<p>Some information on the nature and the amount of bycatch affected by the fishery is collected.</p> <p>The main bycatch species identified is Atlantic cod (<i>Gadus morhua</i>), cusk (<i>Brosme brosme</i>), yellowtail flounder (<i>Pleuronectes ferruginea</i>), and witch flounder (<i>Glyptocephalus cynoglossus</i>).</p>
ETP Species	<p>Endangered Species Act (ESA) and Marine Mammals Protection Act (MMPA) (See section 4.3.3)</p> <p>Sea turtle (See section 4.3.3)</p> <p>Marine mammals (See section 4.3.3)</p> <p>Sources</p> <p>http://www.nmfs.noaa.gov/pr/species/mammals/</p> <p>http://www.nmfs.noaa.gov/pr/species/esa/listed.htm#mammals</p>

4.4.1. Retained species

Crabs

The State of Maine lobster licence is a combined lobster and crab licence⁵. Under the federal licence, rock crab (*Cancer irroratus*) and Jonah crab (*Cancer borealis*) are allowed to be landed, and crab catches are recorded in the Vessel Trip Report (VTR).

Landings of crabs are market driven, and have recently decreased after a peak in 2002 (4,325.41 t). Landings of crabs are available on Maine DMR website, but are not broken down by species⁶. Landings of crabs were 1,383,996 lbs, 1,777,966 lbs, and 1,772,616 lbs in 2013, 2014 and 2015 (preliminary), respectively, which represent less than 1% of lobster total catch by weight.

According to GCB3.5.2 “a species that comprises less than 5% of the total catch by weight may normally be considered to be a minor species (i.e., not ‘main’) in the catch, unless it is of high value to the fisher or of particular vulnerability, or if the total catch of the fishery is large, in which case even 5% may be a considerable catch.” The assessment team considered crab species as a minor retained species. It cannot be said crab species are high value. Crabs are not assessed, and no reference points are established. There is no estimate of total biomass of crabs in the GoM, in term of biomass available to the fishery or estimates of exploitation rates. But according to the NMFS, there is no sign suggesting

⁵ <http://www.maine.gov/dmr/license/2014Lob123.pdf>

⁶ <http://www.maine.gov/dmr/commercial-fishing/landings/documents/11-15LandingsBySpecieswithBonus.Table.pdf>

a negative change in crab species abundance in the recent years and that harvest levels are causing any major problems for crab stocks.

There is no strategy in place to manage crab species. There is no minimum legal size. However, escape vent allows smaller crab individuals to escape from traps and biodegradable panel prevents “ghost fishing”. Also there is an ongoing development of a Jonah crab FMP⁷.

Bait

CB3.5.5 The assessment team shall consider species used as bait in a fishery, if they are caught by the fishery under assessment or elsewhere under the Retained Species component in P2.

With respect to bait use, according to lobster harvesters, and science and management authorities, the main species used as bait in the GOM lobster fishery is the Atlantic herring (*Clupea harengus*). Herring comprises nearly 90% of the bait used in Maine (ASMFC 2014).

In federal waters, bait is recorded by observers.

Saila et al (2002) evaluated that lobster fishery uses a substantial quantity of bait, around 100,000 t/year.

Herring commercial landings were above 150 million lbs in 2010 and 2011, and 70% of Atlantic herring landings in the GoM are used as bait in lobster fisheries throughout coastal New England (Grabowski et al 2010). The amount of herring used as bait is highly likely to be higher than 5% of lobster total catches, therefore it was considered as main retained species.

Atlantic herring fisheries are managed under a joint ASMFC-New England FMC FMP implemented in 1993⁸ and amended twice, and its associated addenda⁹. Management measures include quotas, spawning closures, fishing season, “day out” provision and seasonal trawling prohibition in federal waters.

The latest stock assessment of herring, conducted by the Northeast regional Stock Assessment Workshop in 2015, indicates that herring is not overfished and overfishing is not occurring¹⁰. SSB in 2014 is estimated at 623,000 mt, well above the SSB limit and target of 155,573 and 311,145 mt, respectively. Current fishing mortality is estimated at 0.16, below the fishing mortality threshold of 0.24.

Other species may be used in lower quantity included Acadian redfish (*Sebastes fasciatus*), Atlantic menhaden (*Brevoortia tyrannus*) and skate (winter skate *Leucoraja ocellata*, and little skate *Leucoraja erinacea*) purchased by lobster harvesters.

Redfish fishery is managed by the New England FMC and the NMFS under Northeast multispecies FMP including days-at-sea, special management program, and sectors¹¹. The last benchmark assessment of Acadian redfish occurred in 2008 as part of the Third Groundfish Assessment Review Meeting (GARM III). An update of the Acadian redfish stock was conducted in 2012 as part of the 2012 NE Groundfish Updates Integrated Peer Review. Stock size has increased dramatically in recent years and it is currently not overfished, nor is overfishing occurring (NMFS 2012).

⁷ http://www.asmfc.org/uploads/file/54525259pr41JonahCrabFMP_DraftAddXXIV.pdf

⁸ <http://www.asmfc.org/uploads/file/herringFMP93.pdf>

⁹ <http://www.asmfc.org/species/atlantic-herring#management>

¹⁰ <http://www.asmfc.org/species/atlantic-herring>

¹¹ <http://www.greateratlantic.fisheries.noaa.gov/sustainable/species/multispecies/index.html>

The Atlantic menhaden fishery is managed under an ASMFC FMP implemented in 1981 and last amended in 2012¹². The last benchmark assessment occurred in 2014. The results indicated that the stock is not overfished and overfishing is not occurring (SEDAR 2015).

Skate species are managed under a Northeast Skate Complex FMP. According to the last stock assessment, winter skate and little skate are not overfished and overfishing is not occurring (NEFMC 2015).

4.4.2. Bycatch species

There is no mandatory State logbook implemented in the GoM lobster fishery. A Federal mandatory VTR is in place, and bycatches must be recorded. Both State (DMR Lobster at-sea sampling) and Federal observers record bycatches.

Bycatch in lobster fishery from Federal Observer is presented in Table 5.

Table 5. Bycatch (mt) in the lobster fishery from Federal Observers, 2014.

Source: <http://www.greateratlantic.fisheries.noaa.gov/aps/monitoring/nemultispecies.html>

Species	Bycatch
GoM cod	67.4
GoM yellowtail flounder	0.3
Witch flounder	0.1
Redfish	8.5
White hake	288.9
Pollock	0.1
Northern windowpane	7.4
Southern windowpane	0.1
Ocean pout	61.8
Halibut	1.0

The design of the DMR Lobster at-sea sampling program is to complete 3 trips per zone per month from May to November. Since 2006, additional trips have been added in December, but the trips are dependent of weather, availability of participating boats, and DMR personnel ability (K. Reardon, DMR, February 2016).

A total of 1,489 trips were sampled from 2006 to 2014. Of the 1,489 trips sampled, 1,337 had observed bycatch (Table 6), which represents 89.8 % of the total trips sampled.

Table 7 shows the number of lobster trips in Maine recorded by the DMR Landings Program for lobster from 2008 to 2015.

For the period 2008-2014, the total trips sampled represented 0.07% of the lobster total trips. The total trips sampled represented 0.06% of the lobster trips in 2011, 2012 and 2014, and 0.05% in 2013.

¹² <http://www.asmfc.org/species/atlantic-menhaden>

Table 6. Number of trips completed by DMR Sea Sampling Program, 2006-2014. Source: K. Reardon, DMR, February 2016.

Year	Bycatch Observed	No bycatch observed	Total Trips
2006	170	15	185
2007	170	16	186
2008	128	43	171
2009	157	8	165
2010	133	29	162
2011	145	12	157
2012	160	1	161
2013	141	9	150
2014	133	19	152
TOTAL	1,337	152	1,489

Table 7. Number of lobster trips in Maine recorded by the DMR Landings Program for lobster. Trips prior 2008 are not available. All data are from dealer reported data. *2015 data are preliminary and subject to change without notice. Source: K. Reardon, DMR, February 2016.

Year	Trips
2008	269,558
2009	265,720
2010	280,005
2011	272,974
2012	281,108
2013	283,903
2014	265,949
2015*	264,617

The species most by-caught in lobster traps are Atlantic cod, cunner, cusk, sea raven, sculpins, flatfishes, Acadian redfish, hake, lumpfish, mackerel and pollock (Table 8).

Table 8. Total number of individuals recorded by the DMR Lobster Sea Sampling Program. Source: K. Reardon, DMR, February 2016.

Species	Bycatch totals								
	2006	2007	2008	2009	2010	2011	2012	2013	2014
bass striped	1	1							
bluefish	1								
butterfish					1			2	
cod atlantic	154	71	46	71	31	41	37	23	28
crab horseshoe			8			2			
crab snow			4						
crab spider uncl	34								
cucumber sea			3						
cunner	167	141	53	80	53	92	93	46	62
cusk	101	52	24	19	18	51	31	60	47
cusk-eel uncl				1					
dogfish spiny	53	8	3	3					4
eel american	1		6			3			
eel conger		4			1				
eel european				3					
flatfish unc	9	18	2	17	8	6	1	2	6
flounder atlantic summer (fluke)		8	5	3		2			
flounder atlantic windowpane (sand dab)	1		1		1	2	1		3
flounder atlantic witch (gray sole)						1			
flounder smooth			1						
flounder winter	4	4	10	11	11	13	16	13	20
flounder yellowtail								1	
gunnel rock	3	2	1	2		1	6	17	
haddock	1		1	1					
hagfish									1
hake atlantic red	4		8	4	1	5	1	10	5
hake offshore (whiting black)				3					
hake silver (whiting)	7		1	2	1				2
hake unc	22	18	18	23	3	3	6	36	20
hake white			3						1
halibut atlantic		1					1		
herring atlantic		1						1	
lingcod								1	
lumpfish	6	10	1	1	3	11	1	3	1
mackerel atlantic	64	1	1	1			1	1	1
menhaden unc		1							
monkfish	3								
perch spp			1						
plaice american (dab)	1								
pollock	4	17	3	14	2	2	7	15	4
pout ocean	10	1	1					2	2
redfish acadian ocean perch	67	159	43	208	232	26	176	34	39
sculpin longhorn	517	917	331	654	449	276	258	89	301
sculpin shorthorn	283	244	109	147	112	160	48	45	27
sculpins	132	4	2	72	34	1		1	20
sea bass black	4	2	1	2	1	4	23	36	20
sea raven	309	303	192	176	169	131	87	81	86
shark dogfish		23	3	1	1	1	4		
shark dogfish smooth	31		1						
skate little	1								
skates	1	2		2	1	1			7
smelt rainbow						2			
whiting king	2	2							
wolf eelpout		1		2					
wolffish atlantic	2	3		1				1	
wrymouth	1				1				

A recent study from Zhang and Chen (2015) developed abundances indices for cod and cusk from bycatch data obtained from DMR lobster at-sea sampling program in 2006-2011. The results show that CPUEs calculated based on the sampled traps from lobster fishery at-sea sampling program were low; the average was two fish per 1,000 traps for each species.

A recent study from the University of New England (Jenner et al 2015) sampled 41 fishing trips in the Lobster Fishery Management zones G and showed that a total of 10 different finfish species were captured in lobster traps. Among these 10 species, cod, cusk, flatfish, hake and spiny dogfish were the 5 most prevalent bycatch species.

From the available data, all the bycatches are well below 5% of the lobster total catch in weight.

Although cod (*Gadus morhua*), cusk (*Brosme brosme*), yellowtail flounder (*Pleuronectes ferruginea*), and witch flounder (*Glyptocephalus cynoglossus*) catches represent less than 5% of the total catch, the assessment team considers these species as main bycatch species due to the vulnerability of the species (MSC GCB3.5.2.).

The Atlantic cod has been identified as main bycatch species. The cod fishery is managed by the New England FMC and the NMFS under Northeast multispecies FMP.

Biological reference points are implemented for the GOM cod stock. The GOM cod is overfished and overfishing occurring (Palmer 2014). The SSB in 2013 was estimated to be below 2,500 mt under both the M=0.2 and M-ramp model scenario, which are the lowest ever estimated and are at 4% or 3% of the SSB_{MSY} proxy (47,184 mt or 69,621 mt) in the M=0.2 or M-ramp models, respectively. The 2013 fully selected fishing mortality is estimated to be greater than 1.2 under both models which is more than 6 times greater than the FMSY proxy (0.18 for both models). Fishing mortality is near all time highs despite the fact that fishery catches are at the lowest levels in the time series. The Gulf of Maine cod stock is in poor condition.

Cusk occur in the Northwest Atlantic from New Jersey to the Strait of Bell Isle and on Grand Banks in Newfoundland. A declining population trend has been evident since the late 1960s. In 2004, NMFS made cusk a “species of concern”¹³.

On the 2015 updated assessment, Cape Cod-Gulf of Maine Yellowtail flounder stock was found to be overfished and overfishing is occurring. SSB in 2014 was estimated to be 1,695 mt which is 32% of the biomass target for an overfished stock (SSB_{MSY} proxy = 5,259). The 2014 fishing mortality (average for ages 4-5) was estimated to be 0.35 which is 125% of the overfishing threshold proxy (FMSY proxy = 0.28).

On the latest stock assessment update, it was found that witch flounder continues to be overfished and overfishing is currently occurring. SSB in 2014 was estimated to be 3,129 mt which is 33% of the SSB_{MSY} proxy (9,473). The 2014 fully selected fishing mortality was estimated to be 0.428 which is 153% of the FMSY proxy (0.279).

Based on the nature of the lobster fishery, the assessment team considers that a partial strategy exists to ensure that the lobster fishery does not hinder the recovery of cod, cusk, yellowtail flounder and witch flounder. Lobster traps are not designed to catch fish and biodegradable panel is mandatory to prevent ghost fishing in the event of trap lost. There is evidence that this partial strategy works based on the fact that bycatch estimates are well below the 5% threshold, and the discard mortality rates

¹³ <http://www.nmfs.noaa.gov/pr/species/fish/cusk.htm>

associated with fishes caught in traps is considered to be low (ASMFC 2014, DFO 2005, Taggart et al 1995).

The Federal Standardised Bycatch Reduction program began obtaining bycatch data from Maine lobster boats in 2015. The program only covers a portion of the Maine lobster fleet, about 150 boats which fish in federal waters. Data are obtained from VTRs and around 200 trips/yr are targeted for observer coverage. This represents an additional data source complementary to the Maine sea sampling program (Acoura's surveillance report).

For the Gulf of Maine, the DMR plans to work with ASMFC Lobster Technical Committee and the Northeast Fishery Management Council Groundfish Planning Development Team to responsibly develop the methods of expansion.

4.4.3. ETP species

According to MSC (CB3.11.1), ETP species are defined as those that are recognised by national legislation and those that are listed in Appendix 1 of the Convention on International Trade in Endangered Species (CITES). Species that appear exclusively on non-binding list such as IUCN Red List or that are only the subject of intergovernmental recognition (such as FAO International Plans of Action) and that are not included under national legislation or binding international agreement are not considered as ETP species under MSC standards.

Legislative framework

The *Marine Mammals Protection Act* (MMPA) was enacted on October 21, 1972¹⁴ in response in increasing concerns among scientist and public that significant declines in some species of marine mammals were caused by human activities. The Act established a national policy to prevent marine mammal species and populations stocks from declining beyond the point where they ceased to be significant functioning elements of the ecosystems of which they are part.

All marine mammals are protected under the MMPA. The MMPA prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the U.S.¹⁵

Under the MMPA "take" is defined as "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill any marine mammal" (16 U.S.C. 1362) and further defined by regulation (50 CFR 216.3) as "harass, hunt, capture, collect or kill, or attempt to harass, hunt, capture, collect or kill any marine mammal¹⁶.

The MMPA was amended substantially in 1994 to provide:

- Certain exceptions to the take prohibitions, including for small takes incidental to specific activities, when access by Alaska Natives to marine mammal subsistence resources can be preserved, and permits and authorizations for scientific research;
- A program, the Marine Mammal Authorization Program, to authorize and control the taking of marine mammals incidental to commercial fishing operations;
- Preparation to stock assessments for all marine mammal stocks in waters under U.S. jurisdiction; and
- Studies of pinniped-fishery interactions.

The Marine Mammal Authorization Program (MMAP) allows commercial fishers to lawfully incidentally take a marine mammal in a commercial fishery¹⁷. Current state and federal permit holders

¹⁴ <http://www.nmfs.noaa.gov/pr/pdfs/laws/mmpa.pdf>

¹⁵ <http://www.nmfs.noaa.gov/pr/laws/mmpa/>

¹⁶ <http://www.nmfs.noaa.gov/pr/glossary.htm#take>

¹⁷ <http://www.greateratlantic.fisheries.noaa.gov/Protected/mmp/mmap/>

using gear types categorized as Category I or Category II fisheries (fisheries that have frequent incidental serious injury/mortality interactions with marine mammals or fisheries that have occasional marine mammal serious injury/mortality interactions, respectively) are automatically registered in NOAA Fisheries Service's MMAP. Only those Category I or Category II commercial fishery participants registered under the MMAP are exempted from the Marine Mammal Protection Act's general prohibition on the taking of non-endangered/threatened marine mammal incidental to their fishing operations. The Northeast/Mid-Atlantic lobster trap/pot fishery, including the GoM lobster trap fishery, is categorized as Category I¹⁸. Takes of endangered or threatened marine mammals are not authorized in the Atlantic.

Fishermen must comply with the MMAP requirements summarized below:

- Take an observer aboard the fishing vessel when requested by NOAA Fisheries Service or the designate.
- Report all injuries and deaths of marine mammals within 48 hours of returning from the trip during which these takes occurred using the Mortality/Injury Reporting Form, even if the incident is recorded by an observer.
- Comply with all applicable Take Reduction Plans, gear modifications, and emergency regulations that apply to the fishery.

The *Endangered Species Act* (ESA) was signed on December 28, 1973 and provides for the conservation of species that are endangered or threatened throughout all or a significant portion of their range, and the conservation of the ecosystem on which they depend¹⁹. The ESA was amended several times²⁰.

A species is considered:

- Endangered if it is in danger of extinction throughout all or a significant portion of its range
- Threatened if it is likely to become an endangered species within the foreseeable future

The listing of a species as endangered makes it illegal to "take" (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to do these things) that species. Similar prohibitions usually extend to threatened species. Federal agencies may be allowed limited take of species through interagency consultations with NMFS or USFWS. Non-federal individuals, agencies, or organizations may have limited take through special permits with conservation plans. Effects to the listed species must be minimized and in some cases conservation efforts are required to offset the take. NMFS' Office of Law Enforcement works with the U.S. Coast Guard and other partners to enforce and prosecute ESA violations.

The Protected Resources program conserves and recovers marine resources by doing the following:

- Listing species under the ESA and designating critical habitat;
- Developing and implementing recovery plans for listed species;
- Developing cooperative agreements with and providing grants to States for species conservation;
- Consulting on any Federal actions that may affect a listed species to minimize the effects of the action;
- Partnering with other nations to ensure that international trade does not threaten species;
- Investigating violations of the ESA;
- Cooperating with non-federal partners to develop conservation plans for the long-term conservation of species; and
- Authorizing research to learn more about protected species.

¹⁸http://www.nmfs.noaa.gov/pr/pdfs/fisheries/lof2012/northeast_midatlantic_american_lobster_trappot.pdf

¹⁹ <http://www.nmfs.noaa.gov/pr/laws/esa/>

²⁰ https://www.fws.gov/endangered/esa-library/pdf/history_ESA.pdf

Marine mammal species

GoM represents a significant area for marine mammals. Table 9 shows a list of marine mammals with potential interactions with the GoM lobster fishery.

Table 9. Marine mammal species with possible interactions with the GoM lobster fishery, their status under the ESA is given²¹. E means endangered.

Species	Status	Critical Habitat	Recovery Plan ²²
Blue whale <i>Balaenoptera musculus</i>	E	n/a	yes
Fin whale <i>Balaenoptera physalus</i>	E	n/a	yes
Humpback whale <i>Megaptera novaeangliae</i>	E	n/a	yes
Northern right whale <i>Eubalaena glacialis</i>	E	yes	yes
Sei whale <i>Balaenoptera borealis</i>	E	n/a	yes
Sperm whale <i>Physeter macrocephalus</i>	E	n/a	yes
Minke whale <i>Balaenoptera acutorostrata</i>	Not listed	n/a	n/a
Harbor seal <i>(Phoca vitulina concolor)</i>	Not listed	n/a	n/a

All the whale species above listed are listed under the Appendix 1 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Northern right whale is considered one of the most critically endangered marine populations. The western North Atlantic right whale population ranges primarily from calving grounds in coastal waters of the southeastern United States to feeding grounds in New England waters and the Canadian Bay of Fundy, Scotian Shelf, and Gulf of St. Lawrence (Waring et al 2015). Research results suggest the existence of six major habitats or congregation areas for western North Atlantic right whales: the coastal waters of the southeastern United States; the Great South Channel; Georges Bank/Gulf of Maine including Jordan Basin Cape Cod and Massachusetts Bays; the Bay of Fundy; and the Scotian Shelf. However, movements within and between habitats are extensive and the area off the mid-Atlantic states is an important migratory corridor.

²¹ <http://www.nmfs.noaa.gov/pr/species/esa/listed.htm#mammals>

²² <http://www.nmfs.noaa.gov/pr/recovery/plans.htm>

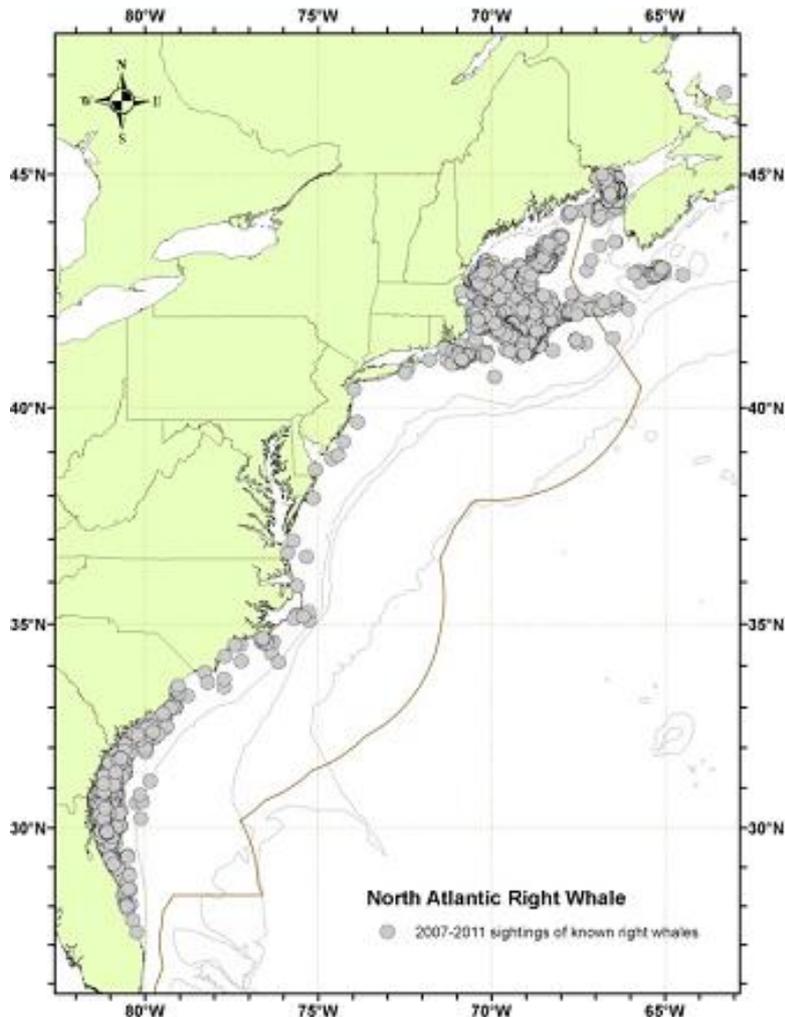


Figure 12. Distribution of sightings of known North Atlantic Right Whales, 2007-2011. Isobaths are the 100 m, 1000 m and 4000 m depth contours. Source: Waring et al 2014, 2015.

The western North Atlantic minimum stock size is based on a census of individual whales identified using photo-identification techniques. A review of the photo-ID recapture database as it existed on 25 October 2013 indicated that 465 individually recognized whales in the catalogue were known to be alive during 2011. This number represents a minimum population size.

Potential biological removal (PBR) is the product of minimum population size, one-half the maximum net productivity rate and a recovery factor for endangered, depleted, threatened stocks, or stocks of unknown status relative to OSP. The recovery factor for right whales is 0.10 because this species is listed as endangered under the ESA. The maximum productivity rate is 0.04, the default value for cetaceans. The PBR means the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. It is important to note that the optimum sustainable population is a population level that is significantly higher than that required for the survival and recovery of the species for purposes of ESA section 7 (NMFS 2014).

PBR for the Western Atlantic stock of the North Atlantic right whale is 0.9.

Examination of the minimum number alive population index calculated from the individual sightings database, as it existed on 25 October 2013, for the years 1990-2010 suggests a positive and slowly accelerating trend in population size (Waring et al 2015). These data reveal a significant increase in the number of catalogued whales with a geometric mean growth rate for the period of 2.6%.

In the western North Atlantic, humpback whales feed during spring, summer and fall over a geographic range encompassing the eastern coast of the United States (including the Gulf of Maine), the Gulf of St. Lawrence, Newfoundland/Labrador, and western Greenland (Waring et al 2015). Figure 13 shows the distribution of humpback whale sightings.

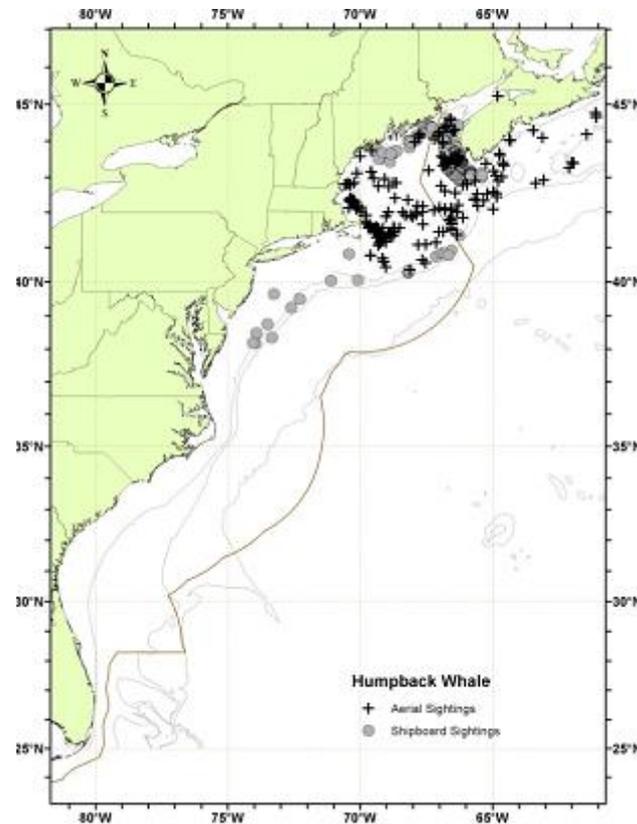


Figure 13. Distribution of humpback whale sightings from NEFSC and SEFSC shipboard and aerial surveys during the summers of 1995, 1998, 1999, 2002, 2004, 2006, 2007, 2008, 2010 and 2011. Isobaths are the 100-m, 1000-m and 4000-m depth contours. Source: Waring et al 2014, 2015.

The overall North Atlantic population (including the Gulf of Maine), derived from genetic tagging data collected by the YONAH project on the breeding grounds, was estimated to be 4,894 males (95% CI=3,374-7,123) and 2,804 females (95% CI=1,776-4,463). In the GoM, a recent abundance estimate of 847 animals (CV=0.55) was derived from a line-transect sighting survey conducted during August 2006, which covered 10,676 km of trackline from the 2000-m depth contour on the southern edge of Georges Bank to the upper Bay of Fundy and to the Gulf of St. Lawrence (Waring et al 2014).

The most recent available data suggest that the GOM humpback whale stock is characterized by a positive trend in size.

PBR for the Gulf of Maine humpback whale stock is 2.7 whales.

Fin whales are found in all oceans of the world, with the exception of the Arctic. Fin whales off eastern U.S., Nova Scotia and the southeastern coast of Newfoundland (Figure 14) are believed to constitute a single stock, the western north Atlantic stock, under the present International Whaling Commission scheme (Waring et al 2014). However, whether the current stock boundaries define biologically isolated units has long been uncertain. During the summer, fin whales can be found in areas of krill concentration, such as oceanic front off Newfoundland, and turbulence areas in the Bay of Fundy (Figure 14).

The best abundance estimate available for the western North Atlantic fin whale stock is 1,618 (CV=0.33) (Waring 2015). This is the estimate derived from the 2011 NOAA surveys and is considered best because it represents the most current data in spite of the survey not including all the stock's range. The minimum population estimate for the western north Atlantic fin whale is 1,234. A trend analysis has not been conducted for this stock. The PBR for the western north Atlantic fin whale stock is 2.5.

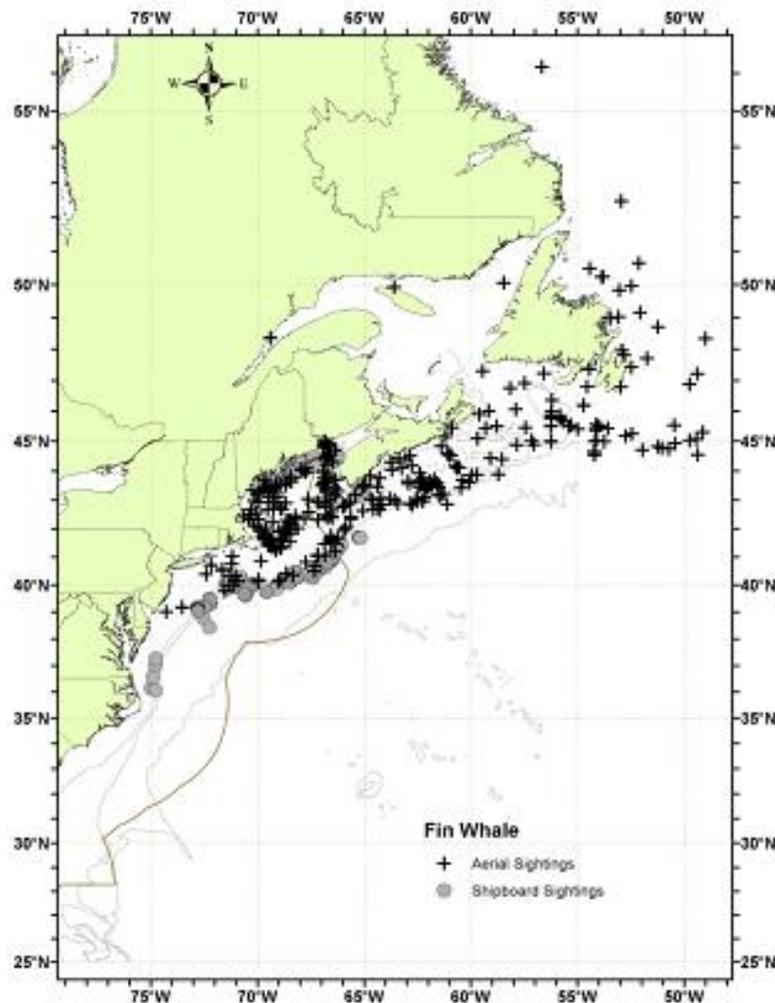


Figure 14. Distribution of fin whale sightings from NEFSC and SEFSC shipboard and aerial survey during the summers of 1995, 1998, 1999, 2002, 2004, 2006, 2007, 2008, 2010 and 2011 and DFO's 2007 TNASS survey. Source: Waring et al 2014, 2015.

The most important threat is noise pollution, caused by shipping, seismic exploration, military sonar and industrial development. Other important threats are changes in food availability, toxic spills, whaling – still occurring in Greenland and Iceland – and diseases. Some less important threats which need to be monitored include ship strikes, entanglements in fishing gear, marine life observation activities and harmful algal blooms²³.

²³ <http://www.dfo-mpo.gc.ca/species-especes/species-especes/finwhale-atlantic-rorqual-commun-atlantique-eng.htm>

North Atlantic blue whales undertake long seasonal migrations, south to north, from their wintering areas in equatorial latitudes to summer feeding areas located in productive waters of temperate to subarctic latitudes (Beauchamp et al 2009).

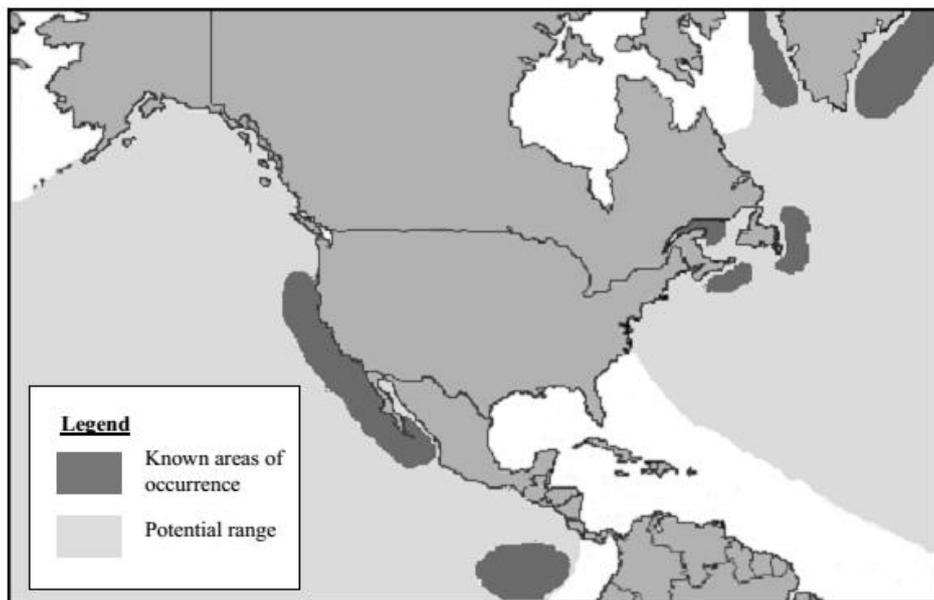


Figure 15. Geographical range of the blue whale, along the coast of North and Central Americas. Adapted from Sears and Calambokidis (2002). Source: Beauchamp et al 2009.

The number of blue whales in the North Atlantic population is unknown, but it would be unlikely this population comprises more than 250 individuals that have reached sexual maturity. The most important factor responsible for the low numbers of blue whales in Canada is historical whaling, which decimated populations from the end of the 19th century until it was prohibited by the International Whaling Commission (IWC) in 1966. Accidental entanglements in fishing gear was classified as low-risk anthropogenic threats in comparison with whale watching and collisions with vessels which were classified as medium-risk anthropogenic threats, and acoustic environmental degradation and food availability which were classified as high-risk anthropogenic threats (Beauchamp et al 2009).

The range of the Nova Scotia sei whale stock includes the continental shelf waters of the northeastern US, and extends northeastward to south of Newfoundland. The southern portion of the species range during spring and summer includes the GOM and Georges Bank (Figure 16). The summer 2011 abundance estimate of 357 is considered the best available estimate (Waring et al 2014, 2015). The minimum population estimate is 236. A trend analysis has not been conducted for this stock. PBR for the Nova Scotia stock of sei whale is 0.5.

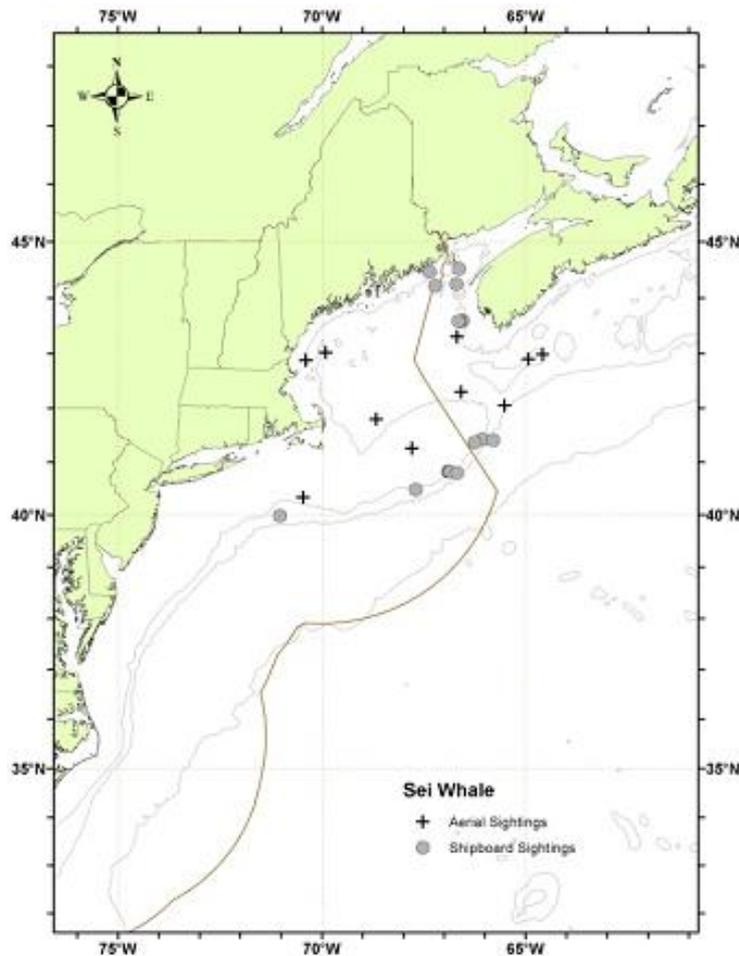


Figure 16. Distribution of sei whale sightings from NEFSC and SEFSC shipboard and aerial survey during the summers of 1995, 1998, 1999, 2002, 2004, 2006, 2007, 2008, 2010 and 2011. Isobaths are the 100 m, 1000 m and 4000 m depth contours. Source: Waring et al 2014, 2015.

The distribution of the sperm whale in the US EEZ occurs on the continental shelf edge, over the continental slope, and into mid-ocean region (Figure 17). Several estimates from selected regions of sperm whale habitat exist for selected time period, however, at present there is no reliable estimate of total sperm whale abundance in the entire North Atlantic. The best recent abundance estimate for sperm whales is the sum of the 2011 surveys which is 2,288 (Waring et al 2014, 2015). A trend analysis has not been conducted for this stock. PBR for the western North Atlantic sperm whale is 3.6.

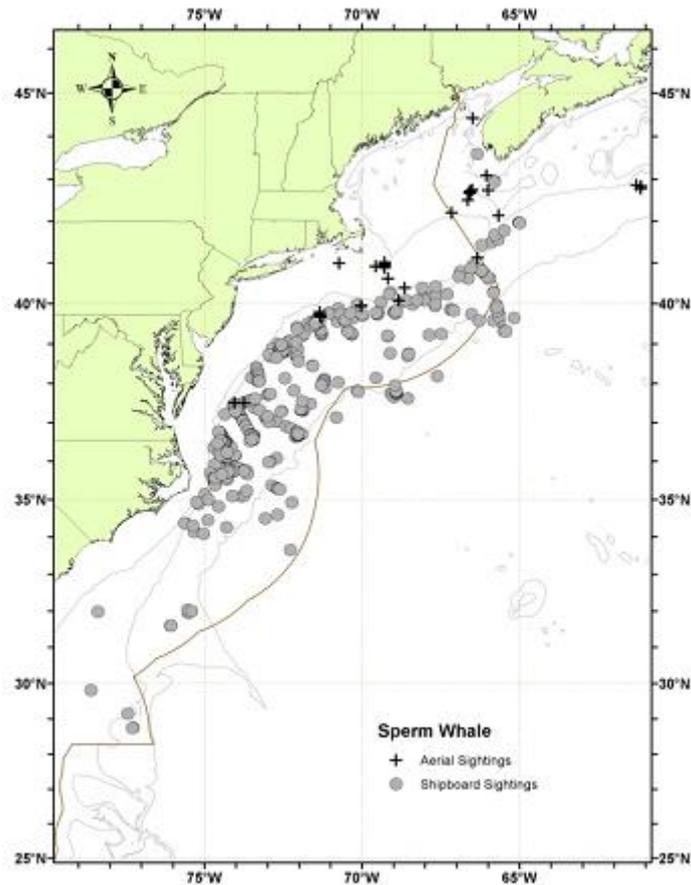


Figure 17. Distribution of sperm whale sightings from NEFSC and SEFSC shipboard and aerial surveys during the summer in 1998, 1999, 2002, 2004, 2006 and 2011. Isobaths are the 100 m, 1000 m and 4000 m depth contours. Source: Waring et al 2014, 2015.

In the North Atlantic, there are four minke whales recognized populations, Canadian East Coast, west Greenland, central North Atlantic, and northeastern North Atlantic (Waring et al 2015). Minke whales off the eastern coast of US are considered to be part of the Canadian East Coast stock (Figure 18). The best recent abundance estimate for this stock is 20,741. The minimum population estimate is 16,199 animals. A trend analysis has not been conducted for this stock. PBR for this stock is 162.

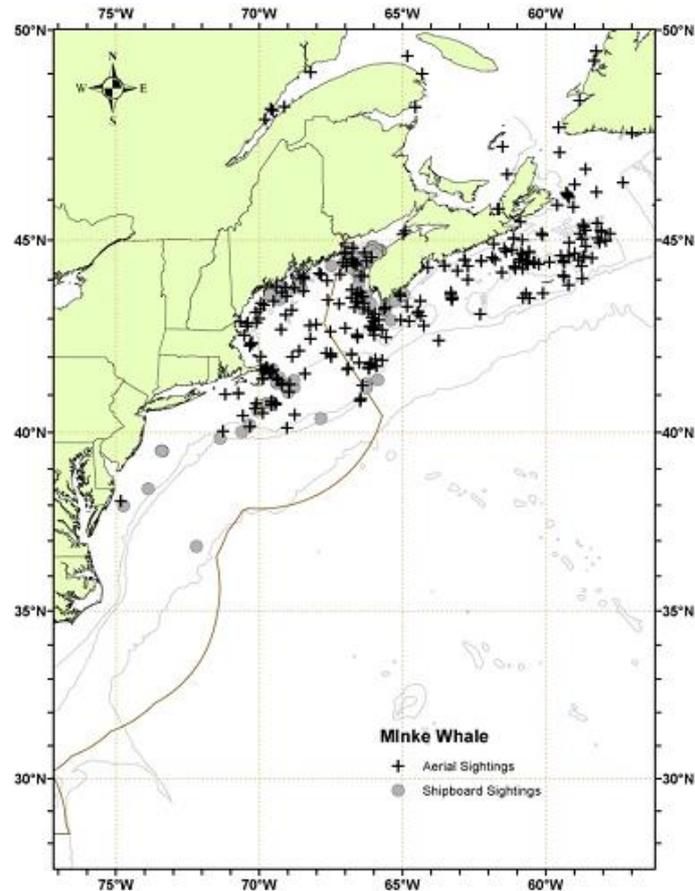


Figure 18. Distribution of minke whale sightings from NEFSC and SEFSC shipboard and aerial surveys during the summers of 1995, 1998, 1999, 2002, 2004, 2006, 2007, 2008, 2010, and 2011 and DFO’s 2007 TNASS survey. Isobaths are the 100 m, 1000 m and 4000 m depth contours. Source: Waring et al 2015.

In the western North Atlantic, harbour seals are distributed from the eastern Canada Arctic and Greenland south to southern New England and New York (Waring et al 2015). The approximate coastal range of harbour seals in the GoM is shown in Figure 19. The best abundance estimate for harbour seals is 75,834 (CV=0.15). The minimum population estimate is 66,884 based on corrected available counts along the Maine coast in 201 (Waring et al 2015). A trend analysis has not been conducted for this stock. PBR for this stock is 2,006.

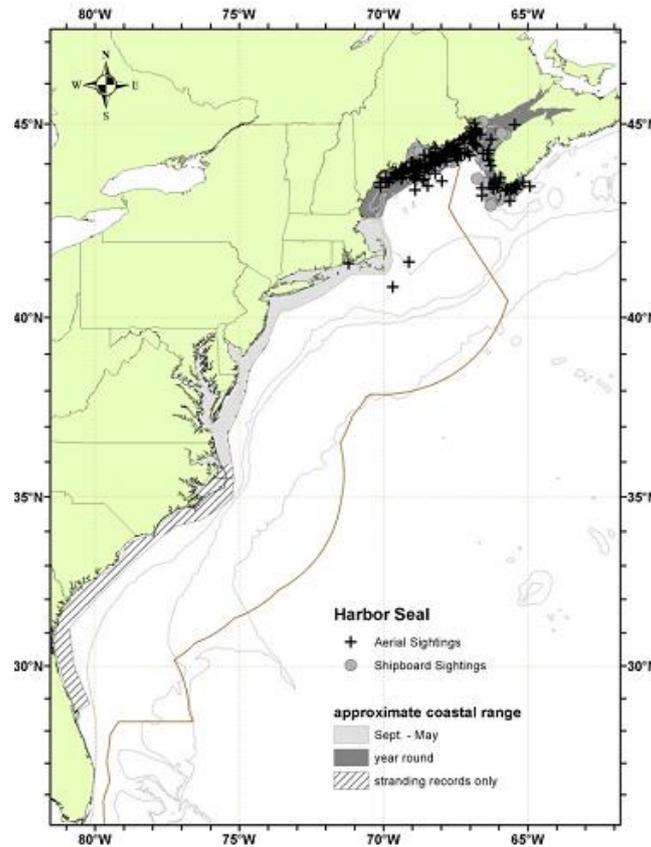


Figure 19. Approximate coastal range of harbour seals, and distribution of harbour seal sightings from NEFSC and SEFSC shipboard and aerial surveys during the summers of 1995, 1998, 1999, 2002, 2004, 2006, 2007, 2008, 2010 and 2011. Isobaths are the 100 m, 1000 m and 4000 m depth contours. Source: Waring et al 2015.

Sea turtle

Table 10 includes the four ESA listed species of sea turtles that occur in the affected environment of the large mesh OT fisheries and sink-gillnets. Three of the four species are considered hard-shelled turtles (i.e., green (*Chelonia mydas*) loggerhead (*Caretta caretta*), and Kemp’s ridley (*Lepidochelys kempii*). The other is the leatherback (*Dermochelys coriacea*) (NEFMC 2015). All are migratory and occur in New England only during the warmer months of the year (Musick 2003).

Table 10. Sea turtles with possible interactions with the GoM lobster fishery, their status under the ESA is given²⁴. E and T mean endangered and threatened, respectively.

Species	Status	Critical Habitat	Recovery Plan ²⁵
Green turtle <i>Chelonia mydas</i>	T	yes	yes
Kemp’s ridley turtle <i>Lepidochelys kempii</i>	E	n/a	yes
Leatherback turtle <i>Dermochelys coriacea</i>	E	yes	yes
Loggerhead turtle <i>Caretta caretta</i>	T	yes	yes

²⁴ <http://www.nmfs.noaa.gov/pr/species/esa/listed.htm#turtles>

²⁵ <http://www.nmfs.noaa.gov/pr/species/turtles/conservation/planning.htm>

Impacts of the GoM lobster fishery on ETP species

Marine mammals

The Northeast/Mid-Atlantic American lobster trap fisheries have been listed as Category I fisheries on the 2015 List of Fisheries according to the level of interactions that result in incidental mortality or serious injury of marine mammals²⁶. Category 1 is fisheries with frequent incidental mortality or serious injury of marine mammals. Atlantic lobster fisheries are listed as Category 1 for Harbor Seal, Minke whale, Humpback whale and north Atlantic right whale.

- For the period 2008-2012, the minimum annual rate of human-caused mortality and serious injury to sei whales was 0.8, including a value of 0.4 for the incidental fishery interaction records, which is below the PBR of 0.5 (Waring et al 2015). For the 2 records of entanglement in fishing gear, one occurred in Canada, and the other one was unassigned with first sight in US and there was no gear recovered/received. Based on the sei whale distribution (Figure 16), there is no to low overlap between the GoM lobster fishery and the sei whale distribution.

Based on the evidence provided, the assessment team determined that there is a high degree of certainty that the effects of the GoM fishery on the sei whale are within the national limits requirements.

- During 2008-2012, sperm whales have not been documented as bycatch in the observed US Atlantic commercial fisheries (Waring et al 2015). Based on the distribution of sperm whale (Figure 17), there is no overlap between the GoM lobster fishery and the sperm whale distribution.

Therefore, the assessment team determined that there is a high degree of certainty that the effects of the GoM fishery on the sperm whale are within the national limits requirements.

- For the period 2008-2012, the minimum annual rate of human-caused mortality and serious injury to fin whale was 3.35, including a value of 1.55 for the incidental fishery interaction records, which is lower than the PBR of 2.5 (Waring et al 2015). Among the 9 records of interaction with fishing gear, 5 occurred in US, among which 2 occurred in Maine, but fishing gear was not present or has not been recovered/received. The most important threat is noise pollution, caused by shipping, seismic exploration, military sonar and industrial development.

Therefore, the assessment team determined that the effects of the GoM lobster fishery on the fin whale are highly likely to be within the national limits requirements.

- There is no stock assessment for blue whale so no determination of the PBR and of the annual human-caused serious injury and mortality. Based on the distribution of blue whale (Figure 15), there is no potential overlap between the GOM lobster fishery and the blue whale distribution.

Therefore, the assessment team determined that there is a high degree of certainty that the effects of the GoM fishery on the blue whale are within the national limits requirements.

- The harbour seal western North Atlantic stock is not considered strategic under the MMPA (Waring et al 2014). The PRB for the western North Atlantic stock for harbour seal is 1,662. For the period 2008-2012, the total human caused mortality and serious injury to harbour seal was estimated to be 441 per year, among which 431 fishery-related. The 2008-2012 average fishery-related mortality and serious injury is well below the PBR.

Therefore, the assessment team determined that there is a high degree of certainty that the effects of the GoM fishery on the harbour seal are within the national limits requirements.

²⁶ http://www.nmfs.noaa.gov/pr/interactions/fisheries/2015_list_of_fisheries_lof.html

- In 2012, 3 minke whales were reported entangled in a lobster trap in Maine in 2010. During 2008-2012 period, the average annual minimum detected human-caused mortality and serious injury was 9.9 per year, including 7.1 minke whale per year from US and Canada fisheries.

Minke whale bycatch in the GoM lobster fishery is by far lower than the PBR of 162.

Therefore, the assessment team determined that there is a high degree of certainty that the effects of the GoM fishery on the minke whale are within the national limits requirements.

A study examined the fishing gear involved in entanglements of 31 right and 30 humpback whales from 1997 to 2002 (Johnson et al 2005). Of the 61 entanglements, 20 right whale and 25 humpback whale entanglements were examined where gear was recovered or identified. Results shown that when gear was identified, 89% of the entanglements were attributed to pot and gill net gear. Lobster pot was the second most common gear identified in entanglements. This study also pointed out that the entanglement outcomes of many whales were considered positive, 71% of whales entangled in pot gear were alive and gear-free, primarily due to successful disentanglement.

- Between 1997 and 2005, 6 entanglements of right whale in lobster gear have been recorded in Atlantic U.S. and Canada, among which 4 were in Maine (Johnson et al 2005). For the period 2007 through 2011, the incidental fishery entanglement records were at 3.25 per year (all fisheries), which correspond to 17 reported fisheries entanglements (Waring et al 2013 and 2014) in both US and Canada waters (13 located in US). For the period 2008 through 2012, the incidental fishery entanglement records were at 3.65 per year (all fisheries) which correspond to 19 reported fisheries entanglements in both US and Canada waters (12.75 located first in US) (Waring et al 2015).

Between 1997-2005, 9 entanglements of humpback whales in lobster gear have been reported, among which 2 were in Maine (Johnson et al 2005). For the period 2007 through 2011, the incidental fishery entanglement records were at 9.95 per year, which corresponds to 53 reported fisheries entanglements (Waring et al 2013 and 2014) for both US and Canada (46 were located first in US). For the period 2008 through 2012, the incidental fishery entanglement records were at 8.90 per year, which corresponds to 50 reported fisheries entanglements (Waring et al 2015) for both US and Canada. This value is well above the PBR of 2.7. Among these 46 records in US, the fishing gear has not been present/recovered in 36 cases; one mortality (George Bank) and one serious injury (Great South Channel) were due to traps; the gear was unidentifiable in 2 cases; gillnet was involved in 4 cases; and hook/monofilament was involved in 2 cases.

In September 2016, it was reported that two right whales were found dead off the Maine Coast and a third was disentangles from fishing gear near Cape Cod²⁷. The fishing gear in those cases has not been identified yet and investigations to identify the gear are continuing.

However, from 2007-2011 and 2008-2012, lobster gear of US or undocumented origin was not recorded in any of serious injury/mortality to right whales. The annual average rate of documented serious injury/mortality events for right whales and humpback whales attributable to lobster gear is less than the PBR for both species (NMFS 2014). The most recent marine mammals SARs indicate that the level of serious injuries and mortalities of right whales and Gulf of Maine humpback whales attributable to U.S. commercial fisheries meets the level necessary to allow for growth to the optimum sustainable population level. The 2014 Biological Opinion (NMFS 2014) concludes that no changes to the fishery are being proposed that would increase the potential for interaction between the US lobster fisheries and right whales and humpback whales. The revised recovery plan for right whale and the recovery plan for humpback whales states that the most significant need for right whale recovery is to reduce or eliminate deaths and injuries from anthropogenic activities, including from commercial fishing operations. The Gulf of Maine lobster fishery is complying with the requirements to reduce the take of whales. The Atlantic Large Whale Take Reduction Plan (ALWTRP) was implemented in 1997

²⁷ <http://www.pressherald.com/2016/09/27/another-endangered-right-whale-found-dead-off-maine-coast/>

and measures implemented evolve to modify fishing operations/practices to reduce the risk of entanglements.

Therefore, the assessment team determined that the effects of the GoM lobster fishery on the right whale and the humpback are highly likely to be within the national limits requirements.

Sea turtles

The lines used in lobster trap fisheries cause entanglement resulting in injury to flippers, drowning and increase vulnerability to boats collisions (NMFS 2014, 2016).

Interactions with loggerhead turtle occurred in waters off New Jersey through Massachusetts. Leatherback turtle are expected to overlap with lobster traps during the months of May through October in waters off New Jersey through Maine.

From 1990 to 2000, 92 entangled leatherbacks were reported from New York through Maine. Additional leatherbacks stranded wrapped in line of unknown origin or with evidence of a past entanglement. From 2002 to 2011, NMFS received 159 reports of sea turtles entangled in vertical lines from Maine to Virginia, with 147 events confirmed. Of the 147 confirmed events during this period, 133 events involved leatherbacks, 13 involved loggerheads, and 1 involved a green sea turtle. NMFS identified the gear type and fishery for 93 of the 147 confirmed events, which included lobster (51), whelk/conch (23), black sea bass (10), crab (7), and research pot gear (2). A review of leatherback mortality documented by the Sea Turtle Stranding and Salvage Network (STSSN) in Massachusetts suggests that vessel strikes and entanglement in fixed gear (primarily lobster pots and whelk pots) are the principal sources of this mortality.

NMFS anticipates that the continued operation of lobster fisheries in the whole Atlantic US may result in the incidental take of sea turtles as follows:

- For loggerhead turtles, the annual take of up to one individual, which may be lethal or non-lethal;
- For leatherback turtles, the annual observed take of up to four individual, which may be lethal or non-lethal.

The primary range of the Kemp's ridley turtle is within the U.S. Gulf of Mexico basin, though they can also occur in coastal and offshore waters of the U.S. Atlantic Ocean.

While sea turtle bycatch varies depending on the fishery, of all commercial fisheries operating along the east coast of the U.S., the Southeast shrimp trawl fishery affects more sea turtles than all other activities combined (NMFS 2016).

Sea turtles are also threatened by egg collection, the destruction and degradation of nesting and coastal habitat, and entanglement or ingestion of marine debris (NMFS 2016). The last one being especially problematic for leatherbacks, juveniles of loggerhead and juveniles of green turtles which spend all or a significant portion of their life in the pelagic environment.

The assessment team considers that the effects of the GoM lobster fishery on the green turtle, the leatherback turtle and the loggerhead turtle are highly likely to be within the national limits requirements.

Based on the primary range of the Kemp's ridley turtle and the entanglement information provide above, the assessment team determined that there is a high degree of certainty that the effects of the GoM fishery on the Kemp's ridley turtle are within the national limits requirements.

Strategy in place to minimize impact on ETP species

NOAA's National Marine Fisheries Service implemented in 1997 the Atlantic Large Whale Take Reduction Plan (ALWTRP) to reduce the risk of serious injury and death of large whales due to

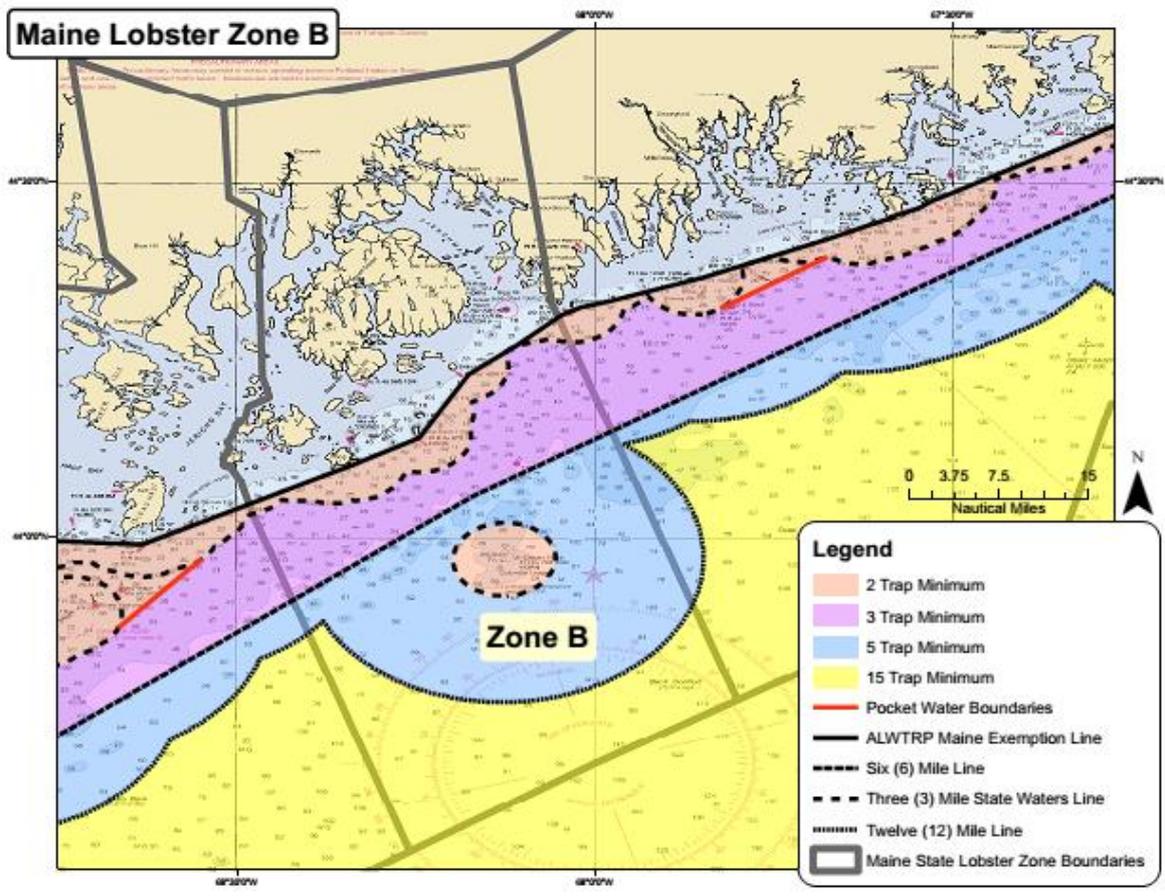
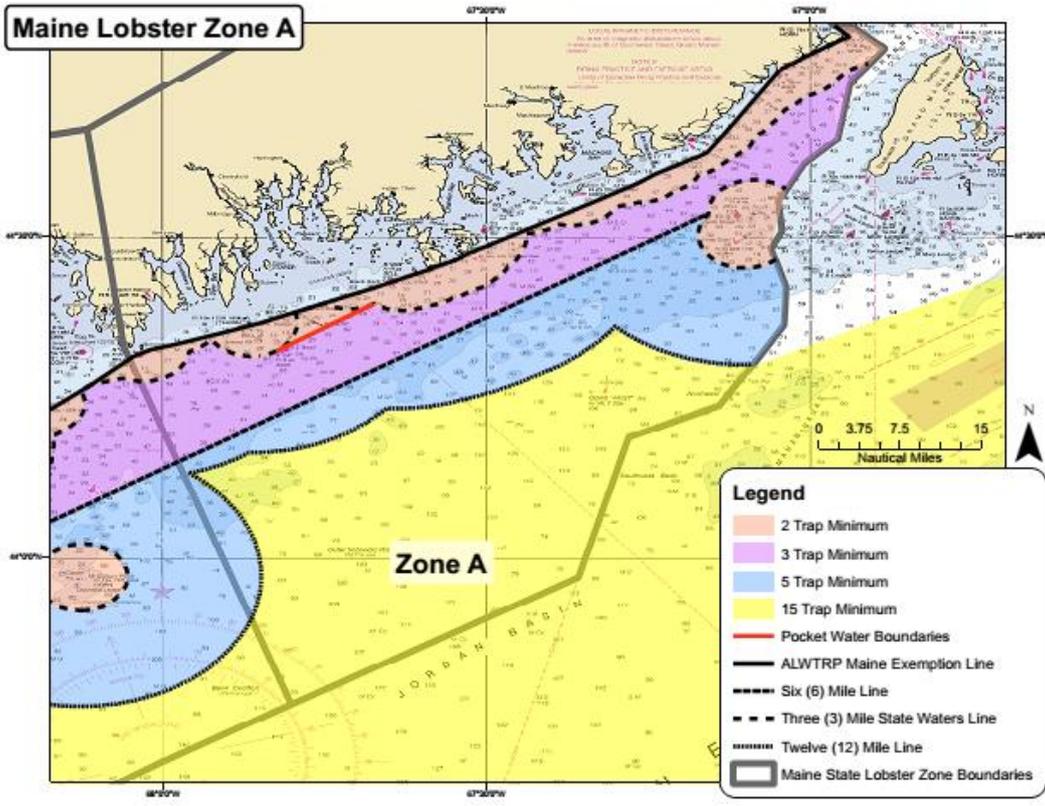
incidental entanglement in U.S. commercial trap/pot and gillnet fishing gear²⁸. The Plan is required by the MMPA and is an evolving plan that changes as NOAA learns more about why whales become entangled and how fishing practices might be modified to reduce the risk of entanglement. It has several components including restrictions on where and how gear can be set; research into whale populations and whale behavior, as well as fishing gear interactions and modifications; outreach to inform and collaborate with fishermen and other stakeholders; and a large whale disentanglement program. The ALWTR team members include fishermen associations, Conservation/Environmental Groups, State and Federal Fishery resource Managers, Fishery Management Organizations and Academic/Scientific Groups.

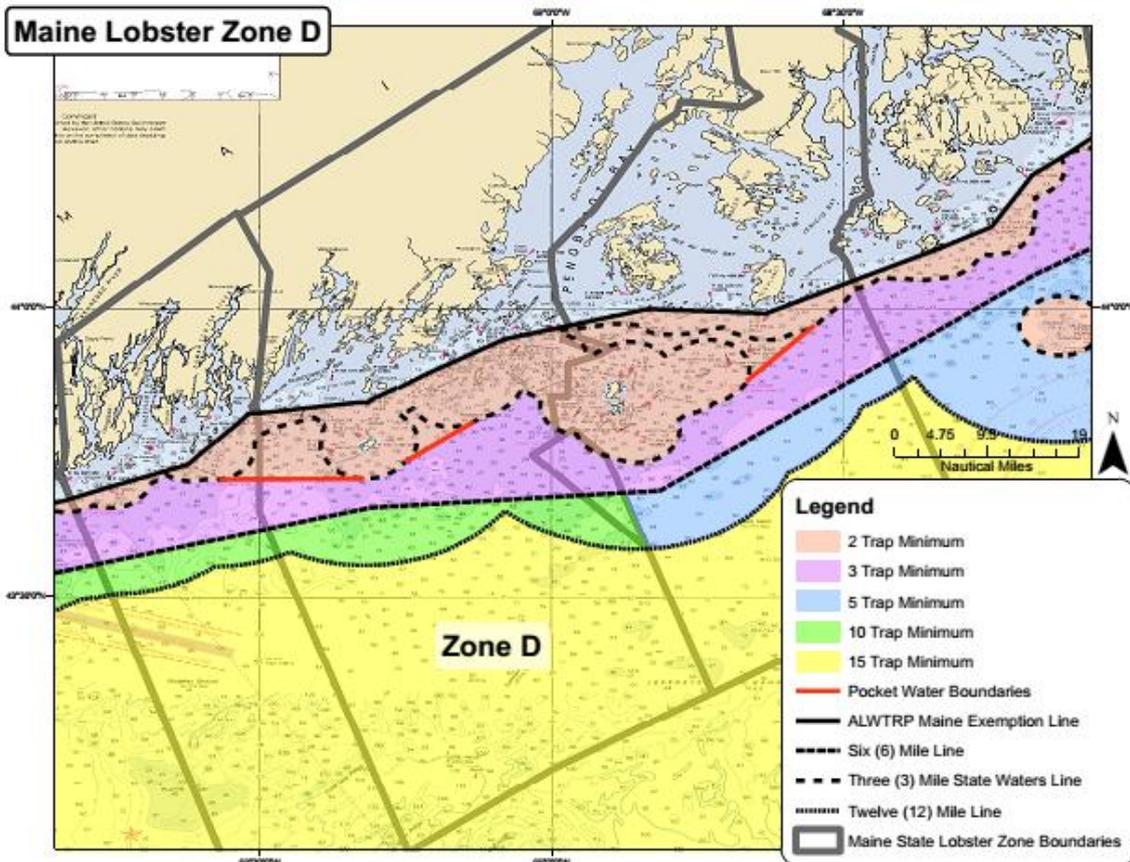
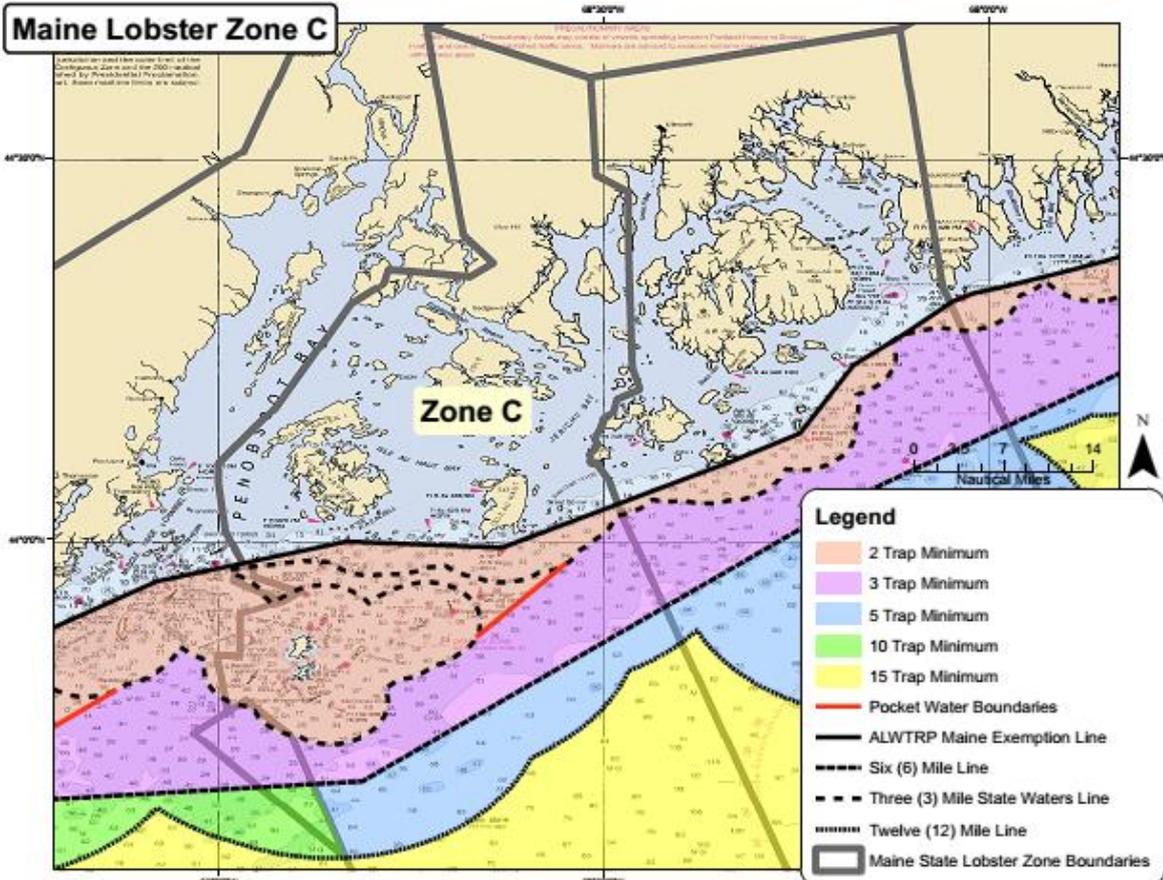
The regulations contained in the 1997 final rule were updated in 1999, 2000. In 2002, NMFS published 3 rules that (1) made further modifications to commercial fishing gear, (2) established a system for temporarily restricting fishing in areas where unexpected aggregations of right whales are observed (Dynamic Area Management , DAM), and (3) established restricted areas based on the annual, predictable aggregations of right whales (Seasonal Area Management, SAM).In June 2007, NMFS published a final rule expanding the Southeast U.S. Restricted Area and prohibiting gillnet fishing or possession during the right whale calving season, with some exceptions. In October 2007, NMFS issued a final rule implementing broad-based gear modifications, largely to replace the DAM and SAM programs. This broad-based gear modification strategy included expanded weak link and sinking groundline requirements; additional gear marking requirements; changes in boundaries; seasonal restrictions for gear modifications; expanded exempted areas; and regulatory language changes for the purposes of clarification and consistency. This final rule was extended and clarified in September 2008 .

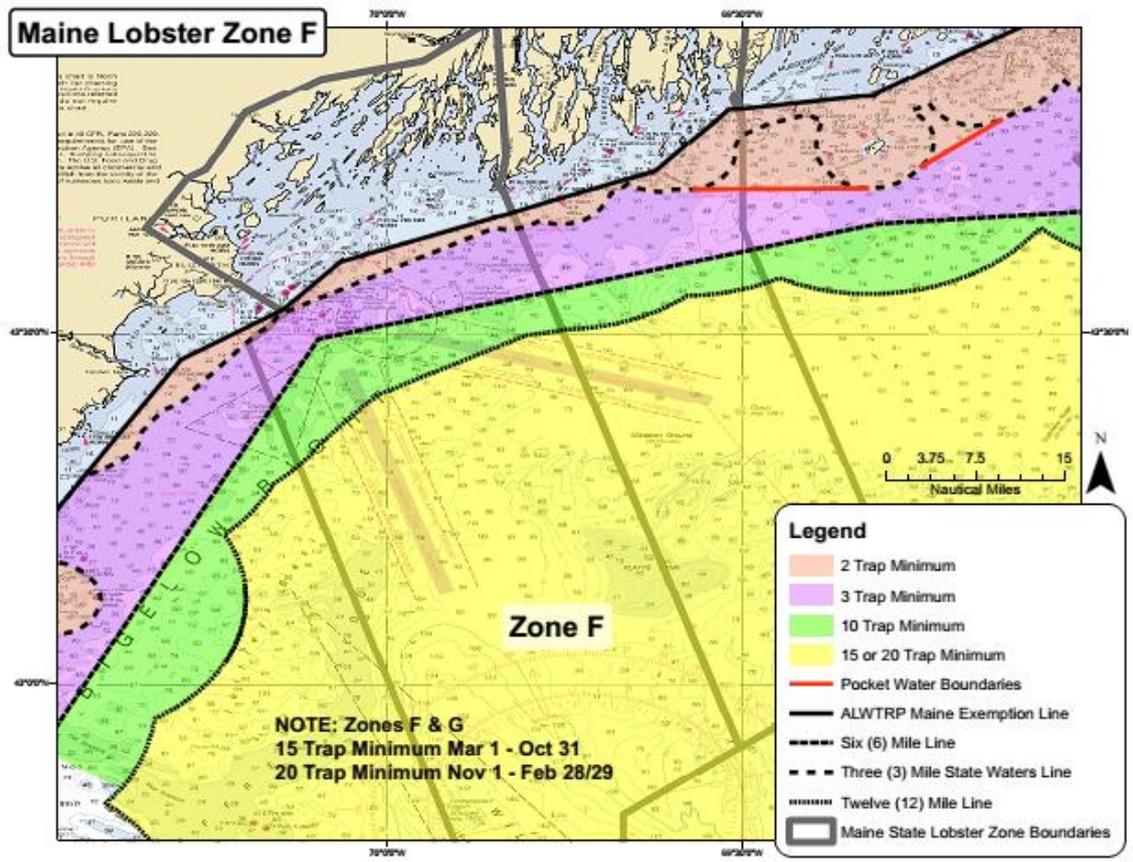
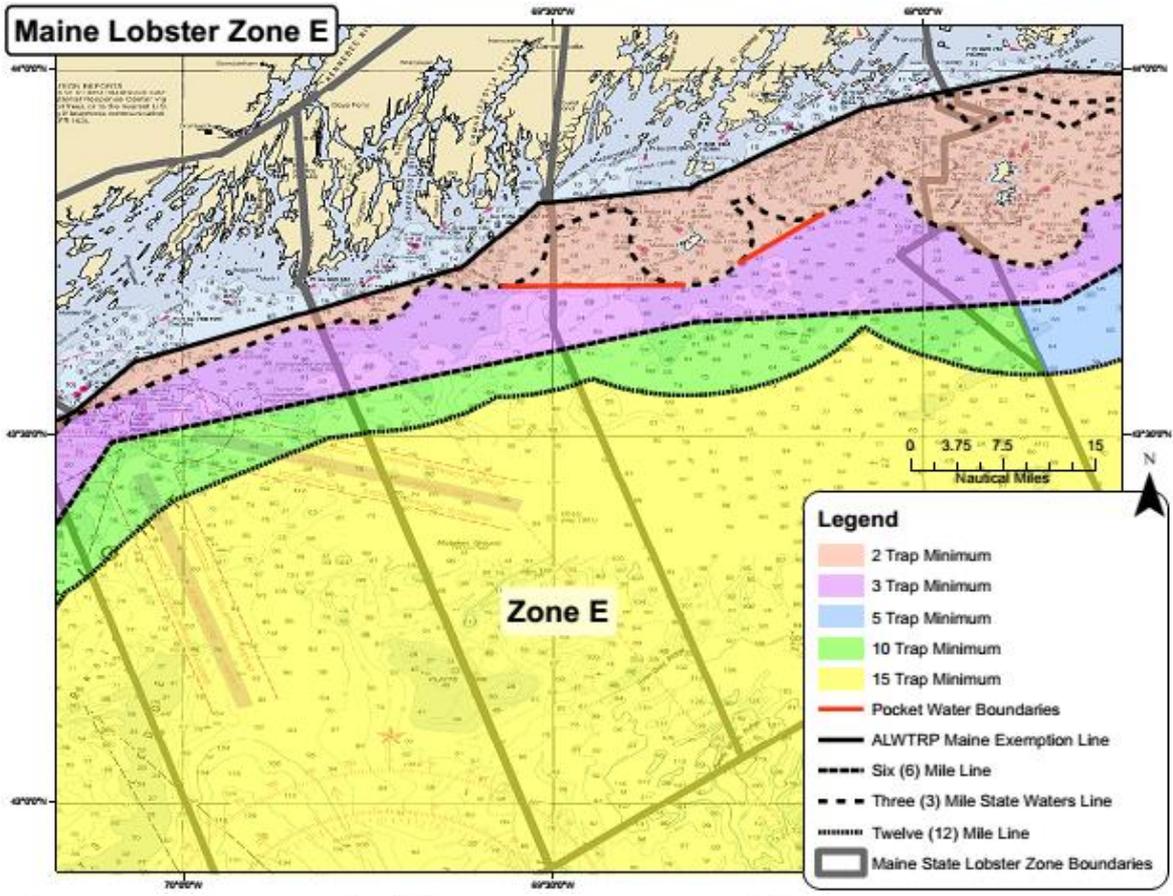
In 2014, the Plan was modified to include new requirements on gear markings, minimum number of traps per trawl, and minimum number of traps per trawl requirements exemptions²⁹.

²⁸ <http://www.greateratlantic.fisheries.noaa.gov/protected/whaletrp/plan/index.html>

²⁹ <http://www.maine.gov/dmr/protected/plansupplements8-14.pdf>







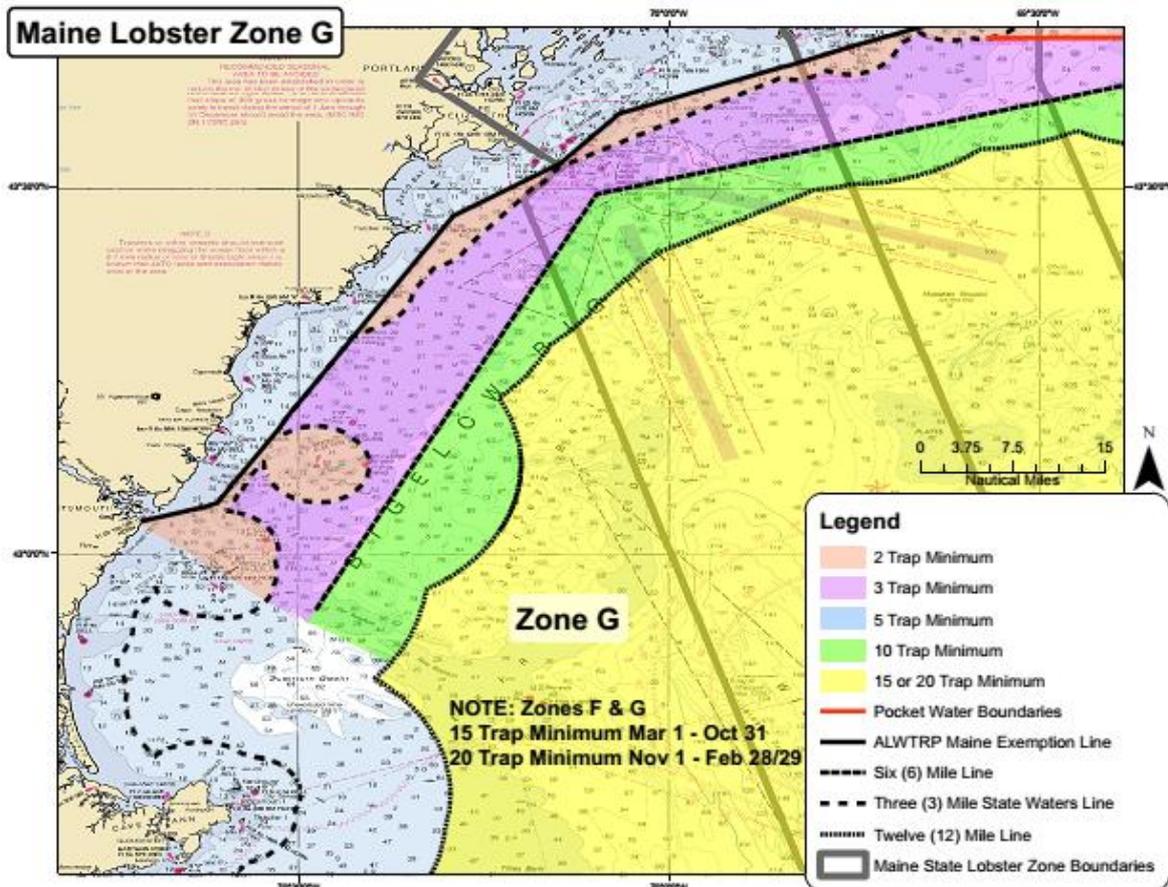


Figure 20. Minimum number of traps per trawl requirements exemptions for Zone A-G in Maine.

Gear marking – Buoy lines must be marked three times with 3 red marks in regulated waters outside the exemption line. No gear marking in the exempted waters of Maine.

4.4.4. Habitat

Legislative and Policy framework

The Habitat Program of the ASMFC is a branch of the Interstate Fisheries Management Program (ISFMP), which serves to support and supplement the efforts of the ISFMP Policy Board, fisheries Management Boards and Technical Committees (ASMFC 2013). The goal of the Habitat Program is to identify, enhance, and cooperatively manage vital fish habitat for conservation, restoration, and protection, and supporting the cooperative management of ASMFC and jointly-managed species. Many of the Commission’s committees are involved in working towards achieving this goal, but the Habitat Committee reports directly to the ISFMP Policy Board on the Commission’s progress toward achieving this goal. The purpose of this document is to outline the Habitat Program structure and function and to promote understanding of Program processes.

NOAA is required to describe and identify essential fish habitat (EFH) in their respective regions, to specify actions to conserve and enhance that EFH, and to minimize the adverse effects of fishing on EFH. Congress defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity."³⁰

³⁰ <http://www.nefsc.noaa.gov/nefsc/habitat/efh/#list>

The National Fish Habitat Action Plan is a nationwide, partnership-based investment strategy to increase the return on fish habitat conservation efforts³¹. The Action Plan encourages collaboration between public agencies, private organizations, and citizens to provide ecosystem-wide results. With a network of regional partnerships setting priorities based on scientific assessment and strategic planning, the Action Plan provides a framework for collaborative action to conserve habitats vital to coastal and marine fisheries.

Spatial distribution of habitats in the GoM

GoM Habitat types and distribution have been widely studied and described.

Habitats of the Gulf of Maine do not exist in isolation, a myriad of ecological relationships and oceanographic processes link them and each habitat functions as part of the larger Gulf of Maine landscape. The movement of water plays a major role in the interconnection of habitats by transporting nutrients, food, larvae, sediments, and pollutants among them. Some of the Gulf of Maine's habitats are relatively well known and scientific understanding of them has expanded in recent years. Other habitats such as cold-water corals have only recently been explored. This overview of habitats in the Gulf of Maine is categorised based on substrate type and sediment grain size (rocky habitats, sandy habitats, muddy habitats), the water column, and biogenic habitats (salt marshes, seagrass beds, kelp beds shellfish beds, cold-water corals).

Maine DMR carried out a mapping of eelgrass meadows during 1993 to 1997, and again in the 2001 to 2010 time period³². Eelgrass maps are available on the DMR websites, as well as maps of changes in eelgrass beds between 1992-98 and 2001-10³³.

Impact of the GoM lobster trap fishery on habitats

Traps are passive gear types that rely on bait to attract the target species. Although trap fisheries are generally considered to have slight impacts on the habitat, traps can impact biogenic structures (e.g. sponges, corals) through crushing or entanglement. Crushing and scouring effects can result if traps are dragged across the bottom during retrieval or during periods of strong currents (e.g. storms, tides). The potential impact of traps on marine habitats is dependent on a variety of factors including:

- Characteristics of the bottom where they are set (sediment type, relief and depth);
- Weight, size and construction material of traps;
- Retrieval methods and sea state, weather, tides, currents;
- Type of rope;
- Soak time;
- Use of anchor or weights; and
- String configuration (e.g. length) can affect degree of entanglement on bottom.

A study carried out by Chuenpagdee et al (2003) ranked fishing gears regarding their collateral impacts on bycatch and on habitats in U.S. each Fishery Management Council region. They found that traps have low and medium impacts on biological and physical component of habitat, respectively. Shester and Micheli (2011) quantify and compare the ecosystem impacts of four gears (lobster traps, fish traps, set gillnets, drift gillnets) used in small-scale fisheries of Baja California, Mexico, using at-sea observations and field experiments. Results indicated that traps caused minimal immediate damage

³¹ <http://www.habitat.noaa.gov/pdf/NFHAP10.pdf>

³² <http://www.maine.gov/dmr/rm/eelgrass/howmapped.htm>

³³ <http://www.maine.gov/dmr/rm/eelgrass/index.htm>

to habitats. A study carried out by Fuller et al (2008) examined the ecological impacts of the most common types of fishing gear used in Canada and assessed the relative severity of these impacts to seafloor habitat and discarded bycatch of target and non-target species. They determined that traps used on the west and east coasts of Canada have a medium low impact on the seafloor and a medium impact on corals and sponges. They pointed out that inshore lobster traps are often smaller and lighter than fish traps so cause less damage. A study carried out by Eno et al (2001) examined the effect of fishing with crustacean traps on benthic species in Great Britain. Result indicated that habitats and their communities appeared relatively unaffected by lobster and crab potting.

Trap fishing effort in the GoM appears to be extremely intensive, with high densities of traps throughout state waters, and relatively frequent hauling of traps. Information on lobster traps distribution from DMR surveys (2009 and 2010), show that fishing effort is concentrated inside the Maine State waters (within 3 miles), however substantial numbers of lines are found beyond 12 miles where right whale are frequently observed. The highest number of traps fished per fishermen is found in Federal waters, followed by the exempt waters, while the highest number of endlines per fishermen is in the exempt waters. The peak months for active fishermen in the exemption area is July and August, September through November for non-exempt state waters, and November through January in Federal waters.

4.4.5. Ecosystem

Gulf of Maine Ecosystem

The Gulf of Maine is a semi-enclosed sea, terrestrially bounded by the north-eastern American states of Maine, New Hampshire, Massachusetts and the Canadian provinces of Nova Scotia and New Brunswick. The total land area of this watershed is 179,008 km² (69,115 square miles). Only Maine is located entirely in the watershed. Frequently described as a “sea within a sea”, the GoM area includes the Bay of Fundy, the Northeast Channel and Georges Bank (Gulf of Maine Council on the Marine Environment 2010). It is bounded to the northeast by the Scotian Shelf and is separated from the waters to the southwest (i.e., southern New England) by a boundary that extends to the tip of Cape Cod. The overall watershed may be sub-divided into 25 major watersheds (13 in the United States and 12 in Canada) and 11 minor coastal drainage areas.

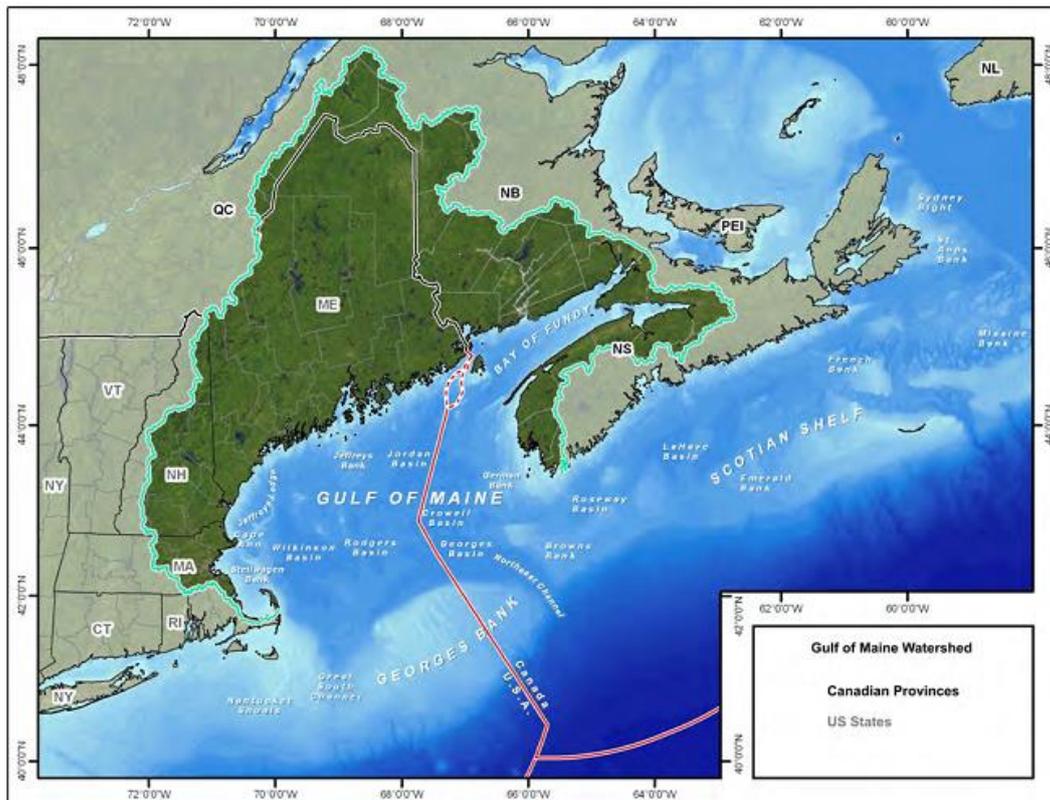


Figure 21. The Gulf of Maine and its watershed (dark green area). Source: Gulf of Maine Council on the Marine Environment 2010.

The GoM is among the most diverse, productive and complex marine temperate areas in the world (Sherman and Skjoldal 2002). The region’s unique topography and oceanographic conditions combine to promote highly productive phytoplankton and zooplankton populations that support high fish populations. Piscivorous predators (carnivorous mammals and fish that consume primarily fish prey) and pelagic species which include marine mammals such as whales, porpoises and seals are resident and abundant.

The physical environment and the chemical environment including suspended particulate matter, nutrients, oxygen, organic carbon and contaminants in the GoM are studied and well known.

The Gulf comprises a vibrant marine ecosystem with high biodiversity. About 3,317 species of flora and fauna can be found in the Gulf of Maine (Valigra 2006). The main groups and species found in the waters of the Gulf are: phytoplankton, zooplankton, macrophytes, benthic invertebrates, pelagic invertebrates, groundfish, pelagic fish (forage fish, large ichthyophagous fish species), birds, marine mammals and turtles (Gulf of Maine Council on the Marine Environment 2010).

Lobster in the GoM food web

As previously reported, larvae lobster are omnivorous, they feed on zooplankton (copepods, crab larvae, eggs) and phytoplankton (diatoms, dinoflagellates and filamentous algae)³⁴. Juveniles and adults are mainly carnivorous and prey on crab, small sea stars, lobster, marine worms, molluscs and fish. Rock crab is a key food resource for lobster. Stomach analysis in Northumberland Strait showed that rock crab was the single most important component of the diet (between 45 and 68% of prey

³⁴ <http://slgo.ca/en/lobster/context/foodchain.html>

biomass) (Hanson 2009). Small sea stars and lobster represented between 0.7 and 12.9% of the prey biomass. Molluscs, polychaetes, and fish remains each did not exceed 7.5% of prey biomass. Predation on planktonic stages of lobster is rare and predation upon benthic stages of lobster is uncommon, principally restricted to finfish (sculpin and cod) and cannibalism (during the moult). DFO investigated lobster and predator-prey relationships using samples collected during trawl surveys in LFA 25 and part of LFA 26 (Comeau et al. 2008). Stomach analysis showed that decapods were the principal prey (57% to 84% of prey biomass), with rock crab being the single most important component of the diet (45% to 78%). Lobster represented 8% to 13% of the prey biomass. It has also been observed that the only demersal fish demonstrated to consume large amounts of lobster was the sculpin.

Grabowski et al (2009) examined the diet and growth of lobsters at different sites in Maine, U.S. and New Brunswick, Canada. The results suggested that the bottom-up forcing (food limitation) can have important consequences for lobster population dynamics and the productivity of lobster fisheries. Contrarily, a study based on local ecological knowledge (interviews of fishermen) suggested a top-down (predation) control mechanism of lobster populations in the Gulf of Maine (Boudreau and Worm 2010).

Impact of GoM lobster fishery on the Ecosystem

There is a large amount of literature which describes the undesired effects of fishing on marine ecosystems. Fishing impacts include changes in size composition of target species, impacts on benthic communities, loss of diversity, disequilibrium of food web and impacts on habitats (Goñi 1998, Pauly et al 1998, Bianchi et al 2010).

The assessment team could not find any concern indicating that the GoM lobster fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the fishery on target, retained and ETP species, and habitats are identified and there is no indication that the fishery causes disruption to the ecosystem main structure and function. There is no indication that the fishery causes serious or irreversible harm to habitats. However, gaps in information on bycatch and habitat impacts have been identified.

There is a partial strategy in place to ensure that the GoM lobster fishery does not pose a risk or irreversible harm to ecosystem structure and function by restricting the number of fishermen, and the number and size of traps in use. A MLS and the release of berried lobster and/or V-notched females are required. Escape vents and biodegradable panels are required on traps, it reduces non-target species catch and impacts from lost traps (“ghost fishing”). The ALWTRP was implemented to reduce injuries and deaths of large whales due to incidental entanglement in fishing gear. However, trap fishing effort in the GOM appears to be extremely intensive, with high densities of traps throughout state waters.

4.5. Principle Three: Management System Background

4.5.1 The Legal Basis and Scope of the Management System

The Overall Lobster Management System

The management system for Gulf of Maine Lobster is a multi-layered one involving the Atlantic States Marine Fisheries Commission (ASMFC or Commission), the State of Maine and the National Marine Fisheries Service (NMFS). This arrangement commenced in 1994 under the Atlantic Coastal Fisheries Cooperative Management Act (Atlantic Coastal Fisheries Act) (US Congress 1993) which was signed into law in December 1993. This was a new approach to coordinated management of coastal migratory

fisheries along the U.S. Atlantic coast. The Atlantic Coastal Fisheries Act provided a mechanism to ensure Atlantic coastal state compliance with mandated conservation measures in Commission-approved fishery management plans. The ASMFC covers the geographical areas of the US east coast that is also governed by the following Federal Regional Fishery Management Councils: New England, Mid-Atlantic and South Atlantic. These councils are responsible for fisheries in the US Extended Economic Zone (EEZ) which extends beyond state waters out to 200 miles. Under the Atlantic Coastal Fisheries Act the Federal Government implements lobster management measures in the EEZ that complement those developed and adopted by ASMFC and implemented by member states in their waters.

Previously, state implementation of a Commission fishery management plan was voluntary. Now, all Atlantic coast states that are included in a Commission fishery management plan must comply with certain conservation provisions of the plan or the Secretary of Commerce may impose a moratorium in that state's waters for harvesting the species in question. American lobster management by ASMFC commenced in 1997 when Amendment 3 established an interstate fishery management plan for that species.

Atlantic States Marine Fisheries Commission – Structure and Responsibilities

The Commission was formed by the fifteen Atlantic Coast states from Maine to Florida to assist in managing and conserving their shared coastal fishery resources through An Interstate Compact (ASMFC 2003), ratified by the states and approved by the U.S. Congress in 1942.

Each state is represented by three Commissioners, which include: the director for the state's marine fisheries management agency; a state legislator; and an individual knowledgeable in fisheries appointed by the state governor. These Commissioners participate in deliberations in the Commission's five main policy arenas: interstate fisheries management, research and statistics, habitat conservation, sport fish restoration, and law enforcement.

The Commission is now responsible for implementing fishery management requirements for all Atlantic coast inter-jurisdictional fisheries for the following species: American eel, American lobster, American shad and river herring, Atlantic croaker, Atlantic herring, Atlantic menhaden, Atlantic sturgeon, bluefish, northern shrimp, red drum, scup and black sea bass, Spanish mackerel, spot, spotted seatrout, striped bass, summer flounder, tautog, weakfish, and winter flounder. Under the framework of ASMFC, individual states manage the American lobster resource within their state waters (0-3 nautical miles from the shoreline) and the Federal government manages the resource in the Exclusive Economic Zone (3-200 nautical miles from the shoreline).

Through the Interstate Fisheries Management Program (ISFMP), Commissioners determine management strategies which the states implement through fishing regulations.

The bulk of the Commission's fisheries decision-making occurs through the Interstate Fisheries Management Program (ISFMP), where species management boards determine management strategies that the states must implement through fishing regulations. The ISFMP Policy Board is responsible for the overall administration and management of the Commission's fishery management programs and provides direct oversight to the individual species management boards. The Program promotes the conservation of Atlantic coastal fishery resources, is based on the use of sound science, and provides adequate opportunity for public participation. Its overall organizational structure is described below.



Figure 22. ASMFC overall organizational structure.

ISFMP Policy Board. The ISFMP Policy Board is comprised of the Commissioners from the fifteen member states and representatives of the District of Columbia (DC), the Potomac River Fisheries Commission (PRFC), the National Marine Fisheries Service and the U.S. Fish and Wildlife Service. It meets at least bi-annually to establish and monitor the program.

Species Management Boards. These species-specific management boards are composed of Commissioners from the states that have declared an interest in the species’ management program. The management boards consider and approve the development and implementation of fishery management plans (FMPs), including the integration of scientific information, proposed management measures, and considerations for habitat conservation and the management of protected species/fishery interactions. The species management boards establish and oversee the activities of their respective Plan Review Teams, Plan Development Teams, Technical Committees and Advisory Panels.

Technical Committees. Species technical committees are comprised of representatives from each state, jurisdiction, and federal agency with a declared interest in the fishery. Technical committees are responsible for providing the species management boards the best scientific information available for guidance in the management process.

Advisory Panels. Advisory panel members are citizens who represent a cross-section of commercial and recreational fishing interests and other stakeholders who are concerned about fisheries conservation and management. The Advisory Panel provides the Management Board with advice concerning species’ management activities.

Plan Development and Review Teams. A Species Plan Development Team is responsible for preparing all documentation necessary for the development of a FMP, Amendment, or Addendum. Once a management program is adopted by a Species Management Board, the Plan Review Team is responsible for providing annual advice on implementation of the management program.

Program Goals

The ISFMP operates according to the standards and procedures contained in the Commission’s Charter. These are that Conservation programs and management measures shall:

1. Be designed to prevent overfishing and maintain over time, abundant, self-sustaining stocks of coastal fishery resources. In cases where stocks have become depleted as a result of overfishing and/or other causes, such programs shall be designed to rebuild, restore, and

subsequently maintain such stocks so as to assure their sustained availability in fishable abundance on a long-term basis.

2. Be based on the best scientific information available.
3. Be designed to achieve equivalent management results throughout the range of a stock or subgroups of that stock.
4. Be designed to minimize waste of fishery resources.
5. Be designed to protect fish habitats.
6. Provide for public participation and comment, including public hearings
7. Provide fairness & equity
8. Allow internal flexibility by states to achieve its objectives through measures implemented and administered by the states; and
9. Fairly and equitably allocate or assign fishery resources among the states.

ASMFC American Lobster Management

The Commission's Lobster Board is responsible for developing the IFMP for American Lobster. The IFMP contains the lobster management measures that states are required to adopt for state waters through their state regulatory authorities. NMFS enacts these recommended measures in the EEZ under the Atlantic Coastal Fisheries Cooperative Management Act (Atlantic Coastal Act), which is the Federal law that gives NMFS authority to enact lobster regulations.

The development of, or change to, ASMFC lobster regulations generally starts with the Commission Lobster Board. The Lobster Board charges its Plan Development Team or Plan Review Team – two Board sub-committees - to investigate whether the Lobster Plan needs to be amended. If these teams believe that further management is needed, the Lobster Board will then charge its Lobster Conservation Management Teams (LCMT) to develop the needed measures. There is a LCMT, comprised of industry representatives appointed by the states, for each of the seven lobster management areas. The LCMTs will meet to develop and approve recommended measures and recommend these measures to the Lobster Board. The Board will seek specialized comment from additional sub-committees, such as the Law Enforcement Committee, the scientific Technical Committee or the industry oriented Advisory Panel. After reviewing the sub-committee advice, the Board then votes on the suggested management measures. The states – each with three representatives on their Lobster Board delegation- get one vote each. NMFS also gets a single vote. Measures approved by the Board are then recommended to the states and NMFS for implementation.

Timelines for the Evolution of American Lobster Management.

The following are the timelines for development of the current American lobster management arrangements as detailed in the 2013 Review of the Atlantic States Marine Fisheries Commission Fishery Management Plan for American Lobster, 2012 Fishing Year and supplemented by updates for 2012 to 2013 as shown on the NMFS American Lobster website.³⁵

1997 – Amendment 3 to the Commission Lobster Plan is implemented. Amendment 3 establishes the regulatory mechanism for the transfer of Federal management authority from Magnuson-Stevens Act to Atlantic Coastal Fisheries Cooperative Management Act (Atlantic Coastal Act). NMFS implemented compatible regulations on December 6, 1999.

1999 – Commercial landings reach historic high of 89 million pounds (40,369 metric tons). The Commission passed Addendum I, which limited access to Areas 3, 4 and 5 to those permit holders who

³⁵ <http://www.greateratlantic.fisheries.noaa.gov/sustainable/species/lobster>

could document fishing history in those areas. NMFS implemented its limited access program in Areas 3, 4, and 5 on March 27, 2003.

2002 – EEZ Nearshore Management Area 5 Trap Waiver for black sea bass fishers was put in place because the pots used for black sea bass are capable of catching lobster. Since Area 5 does not have a large lobster population, NMFS provided a regulatory exemption to allow black sea bass fishers to retain, land and sell a minor allowance of lobster equal to the non-trap harvest restrictions (\$697.26), while fishing for black sea bass with traps in Area.

2007 – Addendum X established new monitoring and reporting requirements for the lobster fishery, and these reporting requirements were implemented by NMFS in 2009.

2007 – Federal regulations for Area 3 off Southern New England amended to be consistent with recommendations from the Commission; new conservation measures include gauge size increases, an escape vent size increase, and trap reductions.

2009 - Addendum XII established consistent management measures for a trap transferability program in Areas 2, 3, and the Outer Cape Cod.

2009 – New management measures are implemented including changes to the lobster maximum carapace (shell) length restrictions, a requirement for all Federal lobster dealers to submit weekly electronic reports for all lobsters purchased from vessel owners with Federal permits and a change to the v-notch definition applicable to several Areas. V-notching is indenting the tail fin of egg-bearing females in a “v” shape before returning it to the water, to mark it as broodstock and protect it from harvest and improve egg production.

2009 – Commission approves Addendum XV, which establishes a Limited Access Program in Area 1.

Spring 2010 – NMFS published a Draft Environmental Impact Statement which addressed effort control and trap transferability in Areas 2, 3, and the Outer Cape Cod. The Commission Lobster Technical Committee released a report indicating that the Southern New England lobster stock was experiencing recruitment failure and recommended a 5 year moratorium on the fishery. The Commission evaluated that recommendation along with several exploitation reduction scenarios.

2012 - NMFS published a final rule on June 1, 2012, to implement a Limited Access Program in the Area 1 lobster trap fishery as required by the Commission in Addendum XV to the Lobster Plan.

2012 – The Commission adopted Addendum XVII on February 7, 2012, which focuses on the rebuilding the Southern New England lobster stock. Addendum XVII proposes to rebuild the stock by reducing fishing effort in the stock area by 10% through: (1) mandatory v-notching of all egg-bearing females in Areas 2, 4, and 5; (2) closed seasons in Areas 4, 5, and 6; and (3) minimum gauge size of 3- 17/32 inches in Area 3.

2012 – The Commission approved Addendum XVIII in August 2012. This Addendum is the first phase of the plans to rebuild the Southern New England lobster stock, by implementing management measures to reduce the level of fishing effort in Areas 2 and 3. This effort reduction will be done through a 25% trap reduction in Area 3 and a 50% trap reduction in Area 2.

2013 – The Commission approved Addendum XIX on February 19, 2013. This Addendum will implement a 10% transfer tax on both full and partial trap transfers in Area 3 when the Individual Transferable Trap Program is implemented.

2013 – The Commission approved Draft Addendum XX for public comment on February 19, 2013. This Addendum establishes an agreement between the offshore lobster permit holders and the groundfish sector vessels to reduce incidences of gear conflict in the proposed opening of Closed Area II, to take place in Framework 48 to the Northeast Multispecies Fishery Management Plan. The purpose of this agreement is also to avoid potential damage to egg-bearing female lobsters by mobile gear trawling on the ocean bottom during the spawning season.

The ASMFC minimum regulatory requirements for lobster management include:

- Limits on the minimum and maximum size of lobster
- Ban on possession of berried and/or v-notched females
- Traps limits
- Trap escape mechanisms
- Limited Access Program
- Voluntary V-notching
- Closed areas
- Limits on the amount of lobster that can be harvested with non-trap gear
- Prohibition on possession of lobster meat and lobster parts.

There are no regulatory requirements for quota limitations or closed seasons. States may adopt more restrictive regulatory measures than those contained in the Commission's IFMP for lobster. States also regulate recreational lobster fishing in their waters.

Federal Lobster Management Responsibilities

Under the Atlantic Coastal Fisheries Act, the Department of Commerce, through the National Marine Fisheries Service, and the Department of the Interior, through the U.S. Fish and Wildlife Service, are responsible for supporting the Commission's Interstate Fisheries Management Program. These responsibilities are met through the development of a program to support and enhance state cooperation in data collection, law enforcement, habitat conservation, fishery research including biological, social, and economic research and fishery management planning. Funds are made available for fisheries management support and planning activities at both the Commission and state level. Additionally, personnel from both agencies are provided to work on Commission programs.

Under the Act, the Department of Commerce has the authority to implement rules in the federal waters of the Exclusive Economic Zone (three to 200 miles from shore) to complement the Commission's lobster fishery management plan as there is no federal fishery management plan for lobster under the Magnuson Fishery Conservation and Management Act (Magnuson Act). These regulations are developed in close cooperation with the Commission. Federal fisheries rules are implemented under the Magnuson-Stevens Act.³⁶

Also, the Department of Commerce has the responsibility and authority to implement moratoria on lobster fishing in state waters when a state does not comply with the mandatory provisions of the Commission lobster fishery management plan. The Commission must report to the Secretary of Commerce and the Secretary of the Interior that the state is out of compliance before the Department of Commerce can take any action. If the Secretary of Commerce determines that a state has failed to implement measures necessary under the Commission lobster fishery management plan, the Secretary shall implement a moratorium on fishing in the noncompliant state's waters. Moratoria are removed from a noncompliant state's waters when the Commission notifies the Secretary of Commerce and the Secretary of the Interior that it is satisfied that the noncompliant state has taken

³⁶ http://www.nmfs.noaa.gov/sfa/laws_policies/msa/nepa.html

appropriate actions to comply with the fishery management plan in question and if the Secretary of Commerce agrees with the Commission's finding.

State of Maine Lobster Management Responsibilities

The State of Maine is responsible for managing the lobster resource in its state waters by implementing management measures as least as restrictive as those required by the Commission's IFMP. The management responsibility for rests with the state's Department of Marine Resources (DMR). The department is established and empowered under Maine Revised Statutes, Title 12, Part 9, Subpart 1, Chapter 605 (Maine 1973). It is headed by a Commissioner, appointed by the Governor after review by the legislative Marine Resources Committee. Title 12, (Conservation) and Part 9 (Marine Resources) also contains the various Marine Resource Laws of the State of Maine. Regulations concerning marine resources are displayed on the DMR website and consist of Chapters 1 to 110. (Maine 2014a) Lobster processing regulations are to be found in Chapter 6 and Lobster (and Crab) regulations in Chapter 26.

There is a recreational component to this fishery that is controlled by regulations. A licence is required which can be obtained after successfully completing a written test based on information contained on the DMR website. Licensed non-commercial harvesters are limited to a total of five traps. Lobster taken in the recreational fishery cannot be sold.

An act passed in 1998 granted the Passamaquoddy Tribe Band the right to participate in the lobster (and crab), scallop and sea urchins fisheries. It also authorized the Maine Indian Tribal-State Commission to study any question or issue regarding the taking of marine resources by members of the Passamaquoddy Tribe and the Penobscot Nation and report any findings and recommendations to the Joint Standing Committee on Marine Resources by December 15, 1998. Four Indian bands now have access to the lobster fishery through a combination of commercial and social licence authorizations. There are ongoing legal issues between the Passamaquoddy Tribe and the State of Maine over the way in which fishing rights may be exercised and regulated. (MITSC 2014)

No persistent flaunting of the lobster fishery is known to occur. The widely prevailing view is that a high level of stewardship and conservation ethic exists in this fishery. This was expressed by many during the site visit and the social science literature contains an extensive array of journal articles attesting to the degree that local practices play a large role in responsible management of this fishery.

The principal lobster fishing regulations in force in the State of Maine are the following:

1. It is unlawful to fish for or take lobsters by any method other than with conventional lobster traps or from any platform other than a vessel.
2. Minimum lobster size has a carapace or body shell length of 3 ¼ inches.
3. Maximum lobster size has a carapace or body shell length of 5 inches.
4. Lobsters must be measured with the State of Maine's double-sided gauge.
5. It is against the law to take, transport, sell or possess any lobster that is bearing eggs.
6. All lobstermen in the State of Maine must participate in a mandatory v-notch program.
7. It is illegal to possess a female lobster marked with a v-notch.
8. All lobster traps must be equipped with a biodegradable ghost panel (Escape Panel).
9. All lobster traps must be equipped with unobstructed vents or gaps in the parlor.
10. All lobster traps, both commercial and non-commercial, must have current State issued tags installed in them to be fished or transported by vessel.
11. All buoys must be attached to the buoy lines with a weak link having a breaking strength no greater than 600 pounds; or all buoy lines must be made entirely of sinking line; or all ground lines must be made entirely of sinking line.
12. Number of traps (pots) is limited by area.

13. Licences are limited in numbers and are subject to reduction in accordance with ratios to traps removals by zone.

No fishing seasons are imposed by the regulations. There is no limitation on vessels sizes but it is reported the maximum size tends to be around 45 ft LOA as larger vessels are difficult to operate in coastal waters.

4.5.2 Consultation Processes

At the ASMFC level, the lobster management board is responsible for ensuring that adequate opportunity for public input is provided during the fishing plan development or amendment process. Public participation is further encouraged through the lobster advisory panels and the establishment of a public hearing process. The Commission's advisory panels are comprised of representatives from the commercial, charter boat, and recreational fishing industries, as well as conservation interests from coastal states participating in the management of lobster. The advisors' role is to provide input into the fishery management planning process from plan development and implementation through to any plan changes or amendments.

Public hearings have also become an important part of the Commission's fishery management planning process, with at least four public hearings being held along the coast for the development of any interstate fishery management plan, plan amendment or addendum. Additionally, the Commission widely disseminates notice of any plan changes and provides opportunities for the submission of written comments.

At the state of Maine level, a several tiered consultation process is in place for lobster management. The following are the various boards, committees or groups that are directly involved in providing input to the lobster management process:

Lobster Advisory Council

The Council advises the Commissioner on activities of the department that relate to the lobster industry. The council may investigate problems affecting the lobster industry and make recommendations to the Commissioner and the Marine Resources Advisory Council concerning its investigations. The Council may review current lobster research programs and plans for research on the lobster stock, and submit advice and recommendations to the Commissioner and the Marine Resources Advisory Council.

The Council, also, may consider disputed issues brought to it by any lobster management policy council established under section 6447. The Council may make recommendations to the Commissioner with regard to resolving such issues.

The Marine Resources Advisory Council

This body was established by Maine Revised Statutes, Title 5, Section 12004-G, Subsection 27 and consists of 16 members. The chair of the Lobster Advisory Council, the chair of the Sea Run Fisheries and Habitat Advisory Council, the chair of the Sea Urchin Zone Council and the chair of the Shellfish Advisory Council are ex officio members of the council. Each other member is appointed by the Governor and is subject to review by the Marine Resources Joint Standing Committee of the Legislature and to confirmation by the Legislature. Five members must be persons licensed to engage in commercial harvesting activities. Those 5 members are selected by the Governor from names recommended to the Governor by groups representing commercial harvesting interests. Each member must represent a different commercial harvesting activity, except that none of those 5 members may represent lobster harvesters. The remaining 7 members must include one public member, 4 persons who hold a non-harvesting-related license, one person representing recreational

saltwater anglers and one person representing the aquaculture industry. The Governor shall select the person to represent the aquaculture industry from among the names recommended by the aquaculture industry. The composition of the Council must reflect a geographical distribution along the coast. All appointed members are appointed for a term of 3 years, except a vacancy must be filled in the same manner as an original member for the unexpired portion of the term. An appointed member may not serve for more than 2 consecutive terms. Appointed members serve until their successors are appointed.

The council gives the commissioner information and advice concerning the administration of the department and carries out other duties specifically delegated by marine resources' laws. The council holds regular quarterly meetings with the commissioner, or the commissioner's designee, and may hold special meetings at any time.

The commissioner annually reports to the council on the present research plan of the department, its implementation, any necessary revision of the plan or extension over the planning period. The council may appoint marine scientists from outside the department to advise it in considering the research plan. After completing its review, the council submits the plan together with any recommendations or comments, to the joint standing committee for marine resources of the Legislature.

Lobster Zone Councils

These lobster management policy councils are appointed for each Management zone by the Commissioner to equitably represent lobster harvesters in each zone. Appointed members are for one-year terms. An election of subsequent council members must be held within one year of the commissioner's initial appointments. The President of the Senate and the Speaker of the House jointly appoint a Legislator to each lobster management policy council. The Legislator is a nonvoting member and serves a 2-year term.

After approval in a referendum, a lobster zone council may propose to the Commissioner rules to place the following limitations on lobster and crab fishing license holders in a given zone, provided the proposed limitations are equal to or stricter than the limitations set out in statute:

- The number of lobster traps fished and the time periods allowed for complying with that number;
- The number of lobster traps allowed on a trawl;
- The time of day when lobster fishing may occur.

A zone council may propose rules for the Apprentice program that:

- Increase the minimum length of time an apprentice must be enrolled in the apprentice program beyond the period established in statute. The minimum enrolment period may not exceed 5 years.
- Require a sponsor of an apprentice to have held a Class I, Class II or Class III lobster and crab fishing license for at least 5 years.
- Require a person to complete all requirements of the apprentice program in a specific zone in order to enter that zone as a Class I, Class II or Class III lobster and crab fishing license holder.

Unless otherwise disallowed, and upon approval in a referendum, a lobster zone council in a limited-entry zone may propose to the Commissioner that the additional limitations be placed on entry into that zone by individuals on the under 18 waiting list, subject to policies of DMR.

A lobster zone council must submit proposed rules to referendum in the zone before submitting those proposed rules to the commissioner. The proposed rules can be submitted to the Commissioner if they are approved by 2/3 of those voting in the referendum.

A person may not be a member of a lobster zone council or vote in a zone's council election or referendum unless:

- They possess a Class I, Class II or Class III lobster and crab fishing license
- They declared at the time of obtaining a Class I, Class II or Class III license that zone as where they fished a majority of their lobster traps.

There are an extensive number other institutions, boards and organizations that all directly or indirectly support management of the Maine lobster fishery. These constitute too large a list to detail here but an indication of the magnitude of this support community can be gleaned from the following link of the DMR website: <http://www.maine.gov/dmr/otherlinks.htm#industrysupport>.

4.5.3 Long term Objectives

The Program Goals of the ISFMP, spelled out in the ISFMP Charter, represent the overall fisheries objectives of the ASMFC activities. These are that Conservation programs and management measures shall:

1. Be designed to prevent overfishing and maintain over time, abundant, self-sustaining stocks of coastal fishery resources. In cases where stocks have become depleted as a result of overfishing and/or other causes, such programs shall be designed to rebuild, restore, and subsequently maintain such stocks so as to assure their sustained availability in fishable abundance on a long-term basis.
2. Be based on the best scientific information available.
3. Be designed to achieve equivalent management results throughout the range of a stock or subgroups of that stock.
4. Be designed to minimize waste of fishery resources.
5. Be designed to protect fish habitats.
6. Provide for public participation and comment, including public hearings
7. Provide fairness & equity
8. Allow internal flexibility by states to achieve its objectives through measures implemented and administered by the states; and
9. Fairly and equitably allocate or assign fishery resources among the states.

For the federal involvement with ASMFC management activities the national standards enshrined in the Magnuson-Stevens Act (now properly called the *Magnuson–Stevens Fishery Conservation and Management Reauthorization Act of 2006*) constitute the long-term fisheries management objectives that must be met by NMFS. These are:

(1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

(2) Conservation and management measures shall be based upon the best scientific information available.

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

(4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

(5) Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

(6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

(8) Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

(9) Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

(10) Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

In addition, NMFS is required to comply with the requirements of the National Environmental Policy Act (NEPA) with completing or approving fisheries management plans. On February 19, 2013, NOAA Fisheries issued an internal policy titled "National Environmental Policy Act Compliance for Council-Initiated Fishery Management Actions under the Magnuson-Stevens Act." The policy clarifies roles and responsibilities of NOAA Fisheries and the Councils, explains timing and procedural linkages, provides guidance on documentation needs, and fosters partnerships and cooperation between NOAA Fisheries and FMCs on NEPA compliance. Issuance of this policy satisfied the requirements of section 304(i) of the MSA.³⁷

Overall, NOAA Fisheries states it is "responsible for the stewardship of the nation's ocean resources and their habitat. We provide vital services for the nation: productive and sustainable fisheries, safe sources of seafood, the recovery and conservation of protected resources, and healthy ecosystems—all backed by sound science and an ecosystem-based approach to management."³⁸

The Purpose of the Maine Department of Marine Resources is stated in Maine's Marine Resource Law Chapter 603: "The Department of Marine Resources is established to conserve and develop marine and estuarine resources; to conduct and sponsor scientific research; to promote and develop the Maine coastal fishing industries; to advise and cooperate with local, state and federal officials concerning activities in coastal waters; and to implement, administer and enforce the laws and regulations necessary for these enumerated purposes, as well as the exercise of all authority conferred by this Part." (Maine 2011).

4.5.4 Incentives for Sustainable Fishing

The overall management system for Gulf of Maine Lobster has components that, in totality, contribute to sustainable fishing of that resource. The various ASMFC, NMFS and state management measures

³⁷ http://www.nmfs.noaa.gov/sfa/laws_policies/msa/nepa.html

³⁸ http://www.fisheries.noaa.gov/aboutus/our_mission.html

provide for resource conservation through the array of rules such as those that limit the size of animals taken, protect fertile females, provide mechanisms for escape from lost traps and generally restrict wasteful fishing practices. Effort controls are exercised through trap limits (set democratically by zone in Maine) and a limited access licensing program that is slowly reducing the number of lobster enterprises (this also has zonal agreed trap reduction ratios, the key to limitation of entry). There is, however, no license transferability provision to permit inter-generational transfer of enterprises and no vessel replacement size limit.

A widespread sense of stewardship has developed in the Maine lobster industry that supports conservation-oriented fishing behaviour by a high degree of compliance. Some of this is achieved through local customary practices that eliminate or reduce territorial competition and others that encourage increased local adherence to fishing rules.

There are no financial assistance programs that specifically encourage increased effort or unsustainable practices. The various loan and related programs available to fishermen are available to all small business operations.

The state has recently conducted An Independent Evaluation of the Maine Limited Entry Licensing System for Lobster and Crab. (GMRI 2012) Amongst other things, this evaluation by the Gulf of Maine Research Institute (GMRI) concluded that:

- Latent or unused potential effort exists in Maine's lobster fishery in the form of issued but unused commercial licenses; issued trap tags that are not being fished; and the potential traps associated with licenses holders who do not currently buy their maximum allowable number of tags.
- While the number of licenses has declined overall, the number of traps issued has increased. As well, fishing capacity has increased through larger vessels and more vessels with additional crew, so more pounds are harvested from those traps. Therefore, the current system is considered as not controlling effort effectively. The recent resource expansion has helped accommodate (if not contributed to) the additional effort. However, in a resource decline, the current system would not be able to respond fast enough to prevent economic if not biological overfishing.

This concern about overcapacity in the lobster fishery was one of the most common views expressed during the Site Visit. It was expressed by both physical and social scientists as well as others members of the fishery community.

4.5.5 Fishery Specific Objectives

Amendment 3 to the Interstate Fishery Management Plan for Lobster (ASMFC 1997) indicates "The plan, when fully implemented, is designed to minimize the chance of a population collapse due to recruitment failure. The goal of Amendment 3 is to have a healthy American lobster resource and a management regime which provides for sustained harvest, maintains appropriate opportunities for participation, and provides for cooperative development of conservation measures by all stakeholders. To achieve this goal, the plan adopts the following objectives:

- 1) Protect, increase or maintain, as appropriate, the brood stock abundance at levels which would minimize risk of stock depletion and recruitment failure.
- 2) Develop flexible regional programs to control fishing effort and regulate fishing mortality rates;
- 3) Implement uniform collection, analysis, and dissemination of biological and economic information; improve understanding of the economics of harvest;
- 4) Maintain existing social and cultural features of the industry wherever possible;

- 5) Promote economic efficiency in harvesting and use of the resource;
- 6) Minimize lobster injury and discard mortality associated with fishing;
- 7) Increase understanding of biology of American lobster, improve data, improve stock assessment models; improve cooperation between fishermen and scientists;
- 8) Evaluate contributions of current management measures in achieving objectives of the lobster FMP;
- 9) Ensure that changes in geographic exploitation patterns do not undermine success of ASMFC management program;
- 10) Optimize yield from the fishery while maintaining harvest at a sustainable level;
- 11) Maintain stewardship relationship between fishermen and the resource.

There are no lobster fishery specific objectives defined for the State of Maine's management of its lobster fishery. A management plan is in development at the state level that will likely rectify this shortfall.

4.5.6 Decision-Making Processes

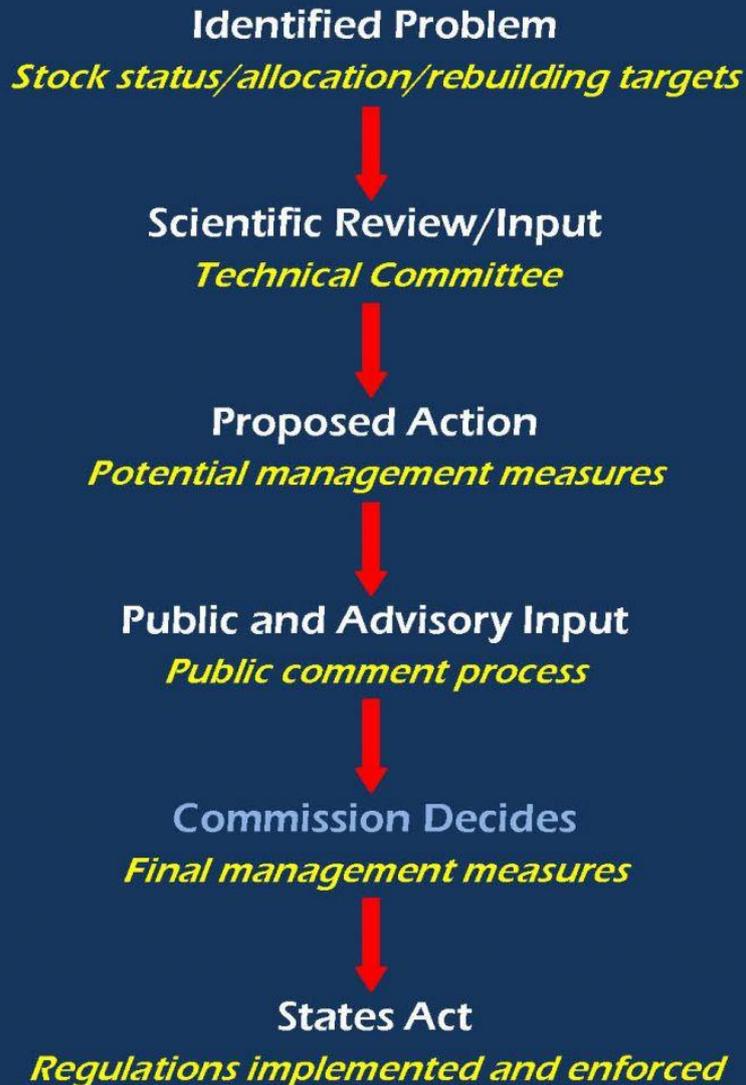
Under ASMFC, Lobster Conservation Management Teams (LCMTs), composed of industry representatives from each management area advise the Lobster Board and recommended changes to the management plan for their areas. This process starts with the identification of a problem by a species management board, as a result of new scientific research, or through stakeholder input. Once a problem is identified the Lobster Board tasks LCMT with the creation of management measures. The LCMT may seek assistance or input from the Technical Committee, Advisory Panel and the Law Enforcement Committee, as needed. The proposed management plan or measure then is distributed for public comment and public hearing may be held in states with an interest in the fishery. Input is also sought from the technical committee, as appropriate, and the advisory panel. The Lobster Board considers the public comments received and the recommendations of the species technical committee and advisory panel during the deliberations for approval of the management program/measures. If the proposed program is approved by the Lobster Board, the involved states are required to implement the approved management measures in their jurisdiction. The NMFS will be requested to institute similar measures in the EEZ.

The Atlantic Coastal Fisheries Act mandates that the Commission provide adequate public participation in its fisheries management planning process, including at least four public hearings (for amendments and new plans). It is also required to maintain procedures for submission of written comments to the Commission.

A generic depiction of the ASMFC's Decision-making Process is show in the diagram below.³⁹ At the Maine State level, proposals for changes or additions to management measures for lobster may be initiated by DMR, one of the zonal advisory boards, the Lobster Advisory Council or even the Joint Standing Committee on Marine Resources.

³⁹ <http://www.asafc.org/fisheries-management/program-overview>

ASMFC Fisheries Decision-Making Process



If the proposal is for a state-level law or regulation it will be concluded by the state legislature enacting a new statute or by the DMR enacting a new or revised regulation. In the latter case, the DMR Advisory Council considers and votes on the regulatory proposal before it is passed. Most new regulatory proposals are subject to a public hearing process before a final decision is taken. Notices of the time, subject and place of public hearings is posted on the DMR website as are the final notices of adoption of new or revised measures as well as the summary of public comments and DMR's responses.

If a proposal for a new or revised measure falls within the purview of ASMFC and garners enough support it would be taken by the LCMT for LCMA 1 and would then proceed through the ASMFC decision-making process described above.

4.5.7 Monitoring, Control and Surveillance

The State of Maine has a dedicated marine law enforcement division in DMR's Marine Patrol and Enforcement ("Marine Patrol"). The level of compliance is deemed to be exceptionally high. The level of compliance as judged by boardings, regularly approaches the 100% mark.

The State's Marine Patrol has 40-45 officers who cover the lobster fishery in LCMA 1, which can extend beyond state waters. Vessels registered in the State of Maine are subject to Maine's fishery rules when fishing in the EEZ when those laws are more restrictive than those applied by NMFS. For that reason, Maine's Marine Patrol officers are deputized as federal special agents under a joint enforcement scheme.

Extensive sanctions for fishery violations are provided in Maine's Revised Statutes (Title 12, Parts 4 and 9) (Maine 1973) and the various regulations (Maine 2014c) made as a result of enabling legislation. While penalties exist for various infractions, possible suspension or revocation of licence appears to be the most effective deterrent that exists and is utilized.

As outlined to the Assessment Team during the site visit, the state Marine Patrol has developed a high level of personal connections with industry and a strong sense of trust. Marine Patrol officers are taught that seeking compliance is the main goal, and this has helped craft relatively good relationships with industry. The Marine Patrol uses discretion in boarding and ticketing further improving this rapport and trust. The director of the Marine Patrol has been on the law enforcement committee of the ASMFC for the past 15 years. This has contributed to the laws or rules that are passed being enforceable.

Board and inspect vessels and licences

From January 1 to June 30, 2015, Marine Patrol Officers inspected vessels and licenses for the above-specified time, resulting in 20,636 hours of harvester enforcement, and 6,220 hours doing public health enforcement (closed areas, etc). The number of boats checked was 1,437. All boats checked were done in Marine Patrol vessels. The number of man hours and vessel hours combined in vessels under 26' were 940.5 man hours and 392.2 vessel hours. Man hours and vessel hours spent in vessels over 26' were 4,203 man hours and 1,550 vessel hours, along with 100 hours in the aircraft for the reporting period.

Interviewed harvesters

The numbers of harvesters checked by Marine Patrol Officers during January 1, 2015 through June 30, 2015 were 5055.

Issue Warning and Summons as appropriate

Marine Patrol Officers issue summonses and warnings, based on their extensive knowledge of the area and local fishermen in that area. Officers try to work with fishermen to gain voluntary compliance. The total number of summonses and warnings issued by Marine Patrol Officers during this reporting period were as follows: 304 summonses issued and 530 warnings.

Violations

The cases that were adjudicated from January 1 to June 30, 2015, were as follows: 158 cases were found guilty, 22 cases were in default, 10 were dismissed, all others were filed remain as open cases and have not yet been adjudicated.

The 158 cases found guilty are detailed in Table 11.

Table 11. Violation description of the 158 cases found guilty between January 1 and June 30, 2015.

Violation description	Number of cases
Untagged traps	3
Exceeding bag limits on striped bass – one fish over	1
Possession of more than 15 gallons of scallop meats, of short scallops	4
Harvesting shellfish from a closed area	26
Harvesting and selling clams without a licence	4
Lobstering without a licence	3
Fishing marine bait in a closed area	1
Operating ATV on public way	2
Engaging in activities while under suspension	13
Possession and selling more than 2 quarts of periwinkles	3
Using totes that measure more than defined standard size	1
Digging more than 50 marine worms on Sunday	2
Shooting migratory game birds while under power	1
Dragging in cable area	1
Operating snowmobile on public way	1
Expired licence	1
Wet storage of ten lobster traps	1
Wet storage of gear over 30 days	14
False attachment of plates	1
Operating with licence suspended or revoked	2
Exceeding the limit on smelt	1
Lobster measurement _short or oversized	2
Municipal shellfish conservation program	3
Digging clams without a town licence	3
Possessing/Harvesting/Selling periwinkles without a licence	16
Harvesting shellfish without a town licence	1
No municipal licence	2
Failure to have harvesters tag on shellfish	5
Operating unregistered motor boat	1
Commercial shellfish - selling without a licence	6
Marine worming without a commercial licence	1
Engaging in the wholesale seafood trade without a licence	2
Operating vessel without proper safety equipment	2
Taking/possession of shellfish while under suspension	2
Violation of condition of release	2
Failure to sign citation	1
Standing in the water dipping/fishing smelts	4
Possession of more than 20% short clam	1
Possession of V-notched lobster	1
Theft by unauthorized taking	2
Possession of more than 50 worms with a licence	1
Harvesting and possessing smelts from a closed area	1
Possession of more than one peck of shellfish without a licence	5
Possessing more than 2 quarts of smelts	1
Theft by deception	1

4.5.8 Research Plan

A wide range of multi-disciplinary research on American lobster and the fishery has been, and continues to be, conducted by government scientists, universities, various research institutes and organizations. These activities are especially evident in the case of the Maine lobster fishery and cover the physical and social science spectrum. Many initiatives are directly involved with the stock assessment process, especially model development and improvement. Others are directed at broader aspects of fisheries management issues, including the application of social science principles and analysis to increase the knowledge base for managing this fishery.

At the ASMFC level, the ongoing reviews of the lobster fishing plan details a number of research priorities recommendations aimed at improving the overall fishery management effort. The 2013 Review of the 2012 lobster fishery management plan contains eight recommendations on Research Needs and Program Research indicating priority areas for future research, analysis and investigation. As well, the 2009 stock assessment report contained 15 recommendations to improve the scope and quality of advice that is provided for management of this stock and fishery. These included a recommendation that "... a socio-economic study be implemented to determine the economic viability of effort reductions" (ASMFC 2009).

As well, Special Report No. 89 of the Atlantic States Marine Fisheries Commission detailed species specific research needs and priorities in 2013 (ASMFC 2013c). There is a section on lobster that outlines high, moderate or low priorities under the following categories: Fishery-Dependent Priorities, Fishery -Independent Priorities, Modeling / Quantitative Priorities, Life History, Biological, and Habitat Priorities and Management, Law Enforcement, and Socioeconomic Priorities.

All these recommendations are meant to provide guidance to appropriate scientists from state organizations as well as those from NMFS in determining the focus of their research efforts. This is supplemented in the case of Maine by the research priority setting that is conducted there periodically.

In 2010 the Department of Marine Resources (DMR), in collaboration with the Gulf of Maine Research Institute (GMRI) and the University of Maine Sea Grant Program launched a new priority setting process to focus and encourage research on areas of greatest importance to the future sustainability of Maine's marine resources. A series of meetings involving fishermen, other industry members, scientists, managers and general public participants were held to help shape research agendas for sea scallop, herring and lobster. These meetings focused on current scientific issues in these fisheries and resulted in an update of research priorities that were generated in a similar series of meetings held in 1996 and 2000.

The lobster specific recommendations are contained in the Lobster Summary Report prepared after the meetings. (Maine 2010) Priority research needs are listed for each of the following research areas: Stock Assessment, Life History, Socioeconomics, Governance and Marine Mammal Interactions. These prioritized listing of research needs are intended to guide the strong collaborative approach to lobster research that exists in the state of Maine. This approach includes state scientists as well as those in academia and in a variety of related research institutes that exists around the state. It would also provide a guide to research funding agencies in determining which projects or studies to assist.

The DMR has an annual research program for lobster that is published on its website.⁴⁰ This research plan is reported by the commissioner to the DMR Advisory Council. After completing its review, the

⁴⁰ <http://www.maine.gov/dmr/rm/lobster/research.htm>

Council submits the plan together with any recommendations or comments, to the joint standing committee for marine resources of the Legislature.

The DMR has a 2010-2012 Research Plan⁴¹ which is intended to be a description of research, monitoring, restoration and outreach activities to be undertaken by the DMR with existing resources, not a comprehensive research plan that outlines all needed research.

4.5.9 Monitoring and Evaluation of the lobster Management System

At the ASMFC level, a number of regular ongoing monitoring and evaluation activities are conducted by several of its committees. The Lobster Plan Review Team reviews the IFMP on almost an annual basis. The review covers the overall performance of the IFMP in terms of the recent management measures, the catch levels, the most recent stock assessment, research and monitoring activities and needs, the compliance of states with implementation of the commission's regulatory requirements and indicates if any states wish to withdraw for the regulation of lobster (De Minimis status). The review concludes with an identification of issues that are called to the attention of the commission and a set of recommended actions to be undertaken to improve overall lobster management.

As well, the Commission's American Lobster Technical Committee reviews specific management measures or issues, usually as requested by the Lobster management Board.

In the state of Maine, the management system for lobster is subject to a more widespread review on a fairly constant basis. The democratically elected lobster zone councils provide a grassroots scrutiny to the system on an ongoing basis. The Lobster Advisory Council also provides a measure of oversight as to how well the management system and various measures are performing. Similar ongoing review functions take place through the DMR Advisory Committee which meets several times each year. The standing committee on marine resources of the legislatures provided a fairly constant review and oversight of the activities of the department.

The recent "town hall" meetings on possible emerging lobster resource problems held by the Commissioner in coastal communities is an example of public review of, and input into, Maine's future lobster management practices and policies. (Lobster Institute 2014)

There have been several recent specific external reviews or analyses of Maine's fishery management activities or policies. These include the Maine Lobster Industry Strategic Plan in 2009, (Maine 2009) the extensive Program Review of the Department of Marine Resources (Maine 2011) by outside consultants in 2011 and the 2012 "Independent Evaluation of the Maine Limited Entry Licensing System for Lobster and Crab" conducted by the Gulf of Maine Research Institute (GMRI 2012). The Strategic Plan was prepared for the Governor's Task Force on the Economic Sustainability of Maine's Lobster Fishery. The Program Review recommended extensive adjustments to the organization, focus and priorities of DMR to provide more effective fisheries management. The evaluation of limited entry licensing addresses concerns with a significant fisheries management tool for the lobster fishery.

Finally, Journal articles abound that analyse and evaluate many aspects of the lobster management system in Maine. An excellent bibliography of these and other articles can be found on the Lobster Institute's website.⁴²

⁴¹ <http://www.maine.gov/dmr/rm/2011-12researchplan.pdf>

⁴² <http://umaine.edu/lobsterinstitute/publications/lobster-library/>

5. Evaluation Procedure

5.1 Harmonised Fishery Assessment

Certification Bodies assessing fisheries that have areas of overlap are required to ensure consistency of outcomes so as not to undermine the integrity of MSC fishery assessments. The CR requirements section Annex CI provides guidance for harmonisation where a fishery in assessment overlaps with an already certified fishery.

The MSC wishes to discourage overlapping assessments to avoid potential financial, consistency and credibility costs, including:

- fisheries managers, scientists and stakeholders receiving duplicate requests for information
- duplication of costs for a fishery's certification, including that expense incurred by fishery management agencies pre- and post-certification; and
- the possibility of different assessments placing different conditions upon the same fisheries managers and upon different fishery clients.

MSC expects that the outcome of the assessment report, particularly the overall result that is achieved (whether a pass or a fail) and the setting of conditions, will be consistent between overlapping fisheries in assessment and certified fisheries.

The current assessment did require harmonization taking into account another assessment led by a different CAB to ensure consistency of assessment outcomes as the Maine Lobster Fishery was MSC certified in March 2013⁴³. SAI Global assessment team has considered the outcomes of the full assessment and the current 2nd surveillance audit (commenced in July 2015 and the report was published in February 2016) for the Maine lobster fishery undertaken by Acoura with the objective to ensure consistency in outcomes and conditions set on the two fisheries.

The following harmonization activities have been undertaken:

- 21st October 2015 – Conference call between SAI Global assessment team and Acoura surveillance audit team.
- 3rd December 2015 - Conference call between SAI Global assessment team and Acoura surveillance audit team. Acoura provided SAI Global with a draft of the surveillance audit.
- 19th December 2015 – SAI Global provided Acoura audit team with a draft of the client draft report.
- 11th January 2016 - Conference call between SAI Global assessment team and Acoura surveillance audit team.
- 20th January 2016 – SAI Global and Acoura requested further information on bycatch to DMR.
- 21st January 2016 – SAI Global and Acoura Lead Assessor participated in a call with MSC to discuss the outstanding harmonization issue related to PI 2.3.1 SG80a & b. SAI Global asked MSC for guidance regarding the interpretation of PI 2.3.1 SG80 a & b and both teams submitted rationales for their respective scores.
- 23rd February 2016 - Conference call between SAI Global assessment team and Acoura surveillance audit team.

⁴³ https://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-west-atlantic/maine_lobster_trap/assessment-downloads

- 7th March 2016 – SAI Global and Acoura participated in a call with MSC to discuss the outstanding harmonization issue related to PI 2.3.1 SG80a & b.
- 22nd March 2016 – Conference call between SAI Global assessment team and Acoura surveillance audit team. Final agreement on outcomes and conditions and associated milestones.

All PI scores are the same than the scores for the certified Maine lobster fishery.

The following items were addressed with respect to harmonized outcomes of this:

Area of Assessment Considered	Outcome of Harmonization with Maine Lobster Trap Fishery																							
Assessment trees	The Default Assessment Tree was used for both full assessments. The initial assessment for the Maine lobster fishery followed MSC procedures and utilized the Default Assessment Tree as described in MSC FAM v.1. However, there is consistency in the general outcome of both assessments with respect to the award of certification and the areas where the fishery is performing below the required 80% pass requirement. MSC Policy Advisory 12v1 also provides further guidance for Principle 1 (PI 1.1.2) for both fisheries scored pre and post FAM implementation which also further supports the harmonization of outcomes, in this case specifically covering the PI that achieved a conditional score.																							
Conditional scores	<p>Initially, 3 conditional scores were assigned to the Maine lobster Fishery for PI 2.4.2 Habitat Management Strategy, 3.1.3 long Term Objectives, and 3.2.1 Fishery Specific Objectives.</p> <p>As a result of the harmonization process, 3 additional conditions were raised on 1.2.2 Harvest Control Rules, 2.2.3 Bycatch Monitoring and Information, and 3.2.4 Research Plan.</p> <table border="1"> <thead> <tr> <th>Condition number</th> <th>PI</th> <th>PI original score</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1.2.2</td> <td>65</td> </tr> <tr> <td>2</td> <td>2.2.3</td> <td>75</td> </tr> <tr> <td>3</td> <td>2.4.2</td> <td>60</td> </tr> <tr> <td>4</td> <td>3.1.3</td> <td>70</td> </tr> <tr> <td>5</td> <td>3.2.1</td> <td>70</td> </tr> <tr> <td>6</td> <td>3.2.4</td> <td>70</td> </tr> </tbody> </table>			Condition number	PI	PI original score	1	1.2.2	65	2	2.2.3	75	3	2.4.2	60	4	3.1.3	70	5	3.2.1	70	6	3.2.4	70
Condition number	PI	PI original score																						
1	1.2.2	65																						
2	2.2.3	75																						
3	2.4.2	60																						
4	3.1.3	70																						
5	3.2.1	70																						
6	3.2.4	70																						
Conditions set	<p>The conditions set are the same for both fisheries and milestones for the fishery under assessment have been harmonized with the milestones for the certified Maine lobster fishery. As a consequence, for the condition on 2.4.2, 3.1.3 and 3.2.1, the year 1 milestone for the fishery under assessment should match with the Year 3 or Year 4 milestone of the Maine lobster fishery</p> <p>The milestones for condition on 2.4.2, 3.1.3 and 3.2.1 for the certified Maine lobster fishery and the status of the conditions (Acoura 2016) are presented below.</p> <p>Condition on 2.4.2</p> <ul style="list-style-type: none"> • By the first annual audit the client is required to provide documented evidence that a plan for the assembly of available information and a program for evaluation has been developed and data collection and assembly for this purpose has commenced. 																							

	<ul style="list-style-type: none"> • By the second annual audit the client will provide documented evidence showing the information that has been assembled and the results of analysis to date. • By the third annual audit the client will provide documented evidence to show the likely significance of the potential cumulative impacts on habitats and, if necessary, implement a partial strategy. • By the fourth annual audit the client will provide evidence that the partial strategy, if warranted, is being implemented successfully. <p><u>Status of the condition at the second surveillance audit: On target – open</u></p> <p>Condition on 3.1.3</p> <ul style="list-style-type: none"> • By the first annual audit the client will provide evidence that action has been taken and a commitment has been made by the management organisations to incorporate explicit long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, within management policy. • By the second annual the client will provide evidence of progress made by the management organisations to incorporate explicit long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, within management policy. • By the third annual audit the client will provide evidence that explicit long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach have been incorporated within management policy. <p><u>Status of the condition at the second surveillance audit: On target – open</u></p> <p>Condition on 3.2.1</p> <ul style="list-style-type: none"> • The client is required to provide evidence by the first annual audit that action has been taken and a commitment has been made by the management organisations to incorporate short and long term objectives, which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, within the fishery’s management system. • The client is required to provide evidence at the second and third annual audits of progress toward a commitment by the management organisations to incorporate short and long term objectives, which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, within the fishery’s management system. • By the fourth annual audit the client will provide evidence that short and long term objectives, which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the fishery’s management system. <p><u>Status of the condition at the second surveillance audit: On target – open</u></p>
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Overlapping between the already certified Eastern Canada offshore lobster, Iles-de-la Madeleine lobster fishery, the Prince Edward Island lobster fishery and the Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence lobster fisheries and the GOM lobster fishery does not occur as the GOM lobster stock is distinct from Canada lobster stocks. In its 1995 Report, the FRCC has defined Lobster Productivity Areas (LPAs) distinct from the LFAs which are management units. The LPAs were defined based on lobster biological characteristics (growth, recruitment), environmental characteristics (water temperature, substrate), and the possibility of lobster exchange between LPAs (adult migration, larval dispersal). LPAs were defined for conservation purposes. Iles-de-la-Madeleine and SGSL have been

considered as distinct LPAs. Migration of adults from Magdalen Islands to other areas in the Gulf of St. Lawrence is not possible due to physical barrier (water temperature). The larval dispersal is likely limited due to currents regime. Also, the SGSL, the Scotian Shelf and the Southwestern have been considered as distinct LPA. Bottom temperatures are low enough to limit lobster movement in deeper areas but because depths are relatively shallow throughout much of the southern Gulf movement of adults throughout this part of the area is possible. Relatively deep water with cold bottom temperatures between eastern Northumberland Strait and western Cape Breton limit movement of adults between these areas. Water temperature in deeper offshore Scotian Shelf waters is cold, constraining offshore movement of lobsters. Surface drift is generally southwest along the Scotian Shelf coast limiting larval dispersal to the offshore area.

Lobsters are known to migrate seasonally in response to the seasonal change in water temperatures and climate conditions. Tagging studies have shown a fair exchange of mature lobster between inshore and offshore waters off southwestern NS, with few lobsters reaching as far afield as Georges Banks (Campbell and Stasko 1985; Campbell 1989). However, long-range movement of adult lobsters from the outer Atlantic coast of Nova Scotia to offshore banks is extremely rare and there are no records of long-range movements of adult lobsters out of or into the Gulf of St Lawrence (Harding et al. 1997). Lobster larval dispersal and circulation patterns suggest that there is likely a high degree of connectivity between exploited populations in the Northwestern Atlantic. Larval dispersal and population genetics studies in the SGSL all suggest that the lobster population in this region can be considered homogeneous (Harding et al. 1997; Chassé and Miller 2010). Harding et al. (1997) indicated that lobsters from the Southern Gulf of St Lawrence, Nova Scotia and Georges Bank are not genetically isolated. However, the authors observed that Gulf of St Lawrence lobsters were about three times as genetically distant from Nova Scotia and Georges Bank lobsters. This slight genetic distinction might have evolved in response to the predominantly “one way” drift of larvae from the Gulf of St Lawrence, forming a partial hydrographic barrier to gene flow. In a more recent genetic study, Kenchington et al. (2009) found that samples in the Gulf of St. Lawrence, with low genetic differentiation, differed from samples from Fundy to Cape Cod, in which genetic differentiation is higher. This is postulated to result from a shelf-edge post-glacial colonisation process, in which lobsters forced onto the southern continental slopes by low temperature and falling water level during the last ice age later re-colonised northwards along the slope and into newly available embayments as the ice retreated, thus creating a south-north genetic difference that is now maintained by contemporary patterns of bathymetry, temperature, and circulation.

A study on the connectivity of lobster populations in the coastal Gulf of Maine (Incze et al 2010) suggested that lobster self-recruitment was important. The inshore concentration of hatching, coupled with faster development, contributed to a slow transport along the coast.

The potential for connectivity of the US GBK and GoM stocks raises the question of whether harmonisation of MSC certifications of the Canadian offshore lobster fishery and the Maine lobster fishery is necessary. The 2015 ASMFC assessment of GBK and GOM lobster stocks concluded that the assessment should combine these two stocks, which formerly had been considered separate and assessed separately. Two information sources supported combining the two stocks:

- differences in abundance and size composition between spring and fall surveys indicated that lobsters are very likely moving between the two areas;
- the model fit for GBK alone was poor but markedly improved when the model was run for GBK+GOM combined.

The ASMFC assessment concluded that a study of stock connectivity via a tagging study would be needed to validate combining the two stocks into a single stock. The Canadian offshore lobster fishery (DFO 2014) harvests lobster on GBK, in all likelihood from the same stock as the US GBK offshore lobster fishery.

Since connectivity of the GBK and GoM stock is still to be validated by biological studies, the team concluded that it was not appropriate to harmonise the two certifications at this time. Lack of harmonisation will not prejudice stock status, as the Canadian harvest from the potentially shared stock is very small relative to the total. The Canadian TAC for the offshore lobster fishery as a whole is 720 t/yr, and only a small portion of this is taken on George's Bank (between 125 and 166 t/yr in 2007-2012, less in earlier years), the remainder being from offshore Nova Scotia.

As a result, lobsters in the GoM are considered as distinct biological units from LFA 41 and Canadian lobster fisheries.

5.2 Previous assessments

This fishery has previously been assessed against the MSC Principles and Criteria for Sustainable Fishing under a previous certificate. The current assessment did require harmonization taking into account another assessment led by a different CAB to ensure consistency of assessment outcomes as there is other Maine lobster fishery undergoing certification (See Section 5.1).

5.3 Assessment Methodologies

The MSC Principle and Criteria for Sustainable Fishing Standard sets out the requirements for a certified fishery. The Certification Methodology adopted by the MSC involves the interpretation of these Principles and Criteria into specific Performance Indicators against which the performances of the fishery can be measured according to pre-specified guideposts. A fishery is assessed against three Principles. The default assessment tree developed by the MSC includes 31 Performance Indicators. Principle 1 addresses the need to maintain the target stock at a sustainable level; Principle 2 addresses the need to maintain the ecosystem in which the target stock belongs to; and Principle 3 addresses the need for an effective fishery management system to fulfil Principles 1 and 2 and ensure compliance with national and international regulations.

PRINCIPLE 1: Sustainable fish stock

A fishery must be conducted in a manner that does not lead to overfishing or depletion of the exploited populations, and for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Criteria

1. The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.
2. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within the specified time frame.
3. Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

PRINCIPLE 2: Minimizing environment impact

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

The intent of this principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

Criteria

1. The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.
2. The fishery is conducted in a manner that does not threaten biological diversity at genetic, species or population levels and avoids or minimizes mortality of, or injuries to endangered, threatened or protected species.
3. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within the specified time frame.

PRINCIPLE 3: Effective management

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principle 1 and 2, appropriate to the size and scale of the fishery.

Management system Criteria

1. The fishery shall not be conducted under controversial unilateral exemption to an international agreement.

The management system shall:

2. demonstrate clear long-term objectives consistent with MSC Principles and Criteria and contain a consultative process that is transparent and involves all interested and affected parties so as to consider all relevant information, including local knowledge. The impact of fishery management decisions on all those who depend on the fishery for their livelihoods, including, but not confined to subsistence, artisanal, and fishery-dependent communities shall be addressed as part of this process.
3. appropriate to cultural context, scale and intensity of the fishery – reflecting specific objectives, incorporating operational criteria, containing procedure for implementation and a process for monitoring and evaluating performance and acting on findings;
4. observe the legal and customary and long term interests of people dependent on fishing for food and livelihoods, in a manner consistent with ecological sustainability;
5. incorporate an appropriate mechanism for the resolution of disputes arising within the system;
6. provide economic and social incentives that contributes to sustainable fishing and shall not operate with subsidies that contribute to unsustainable fishing;
7. act in a timely and adaptive fashion on the basis of the best available information using a precautionary approach particularly when dealing with scientific uncertainty;

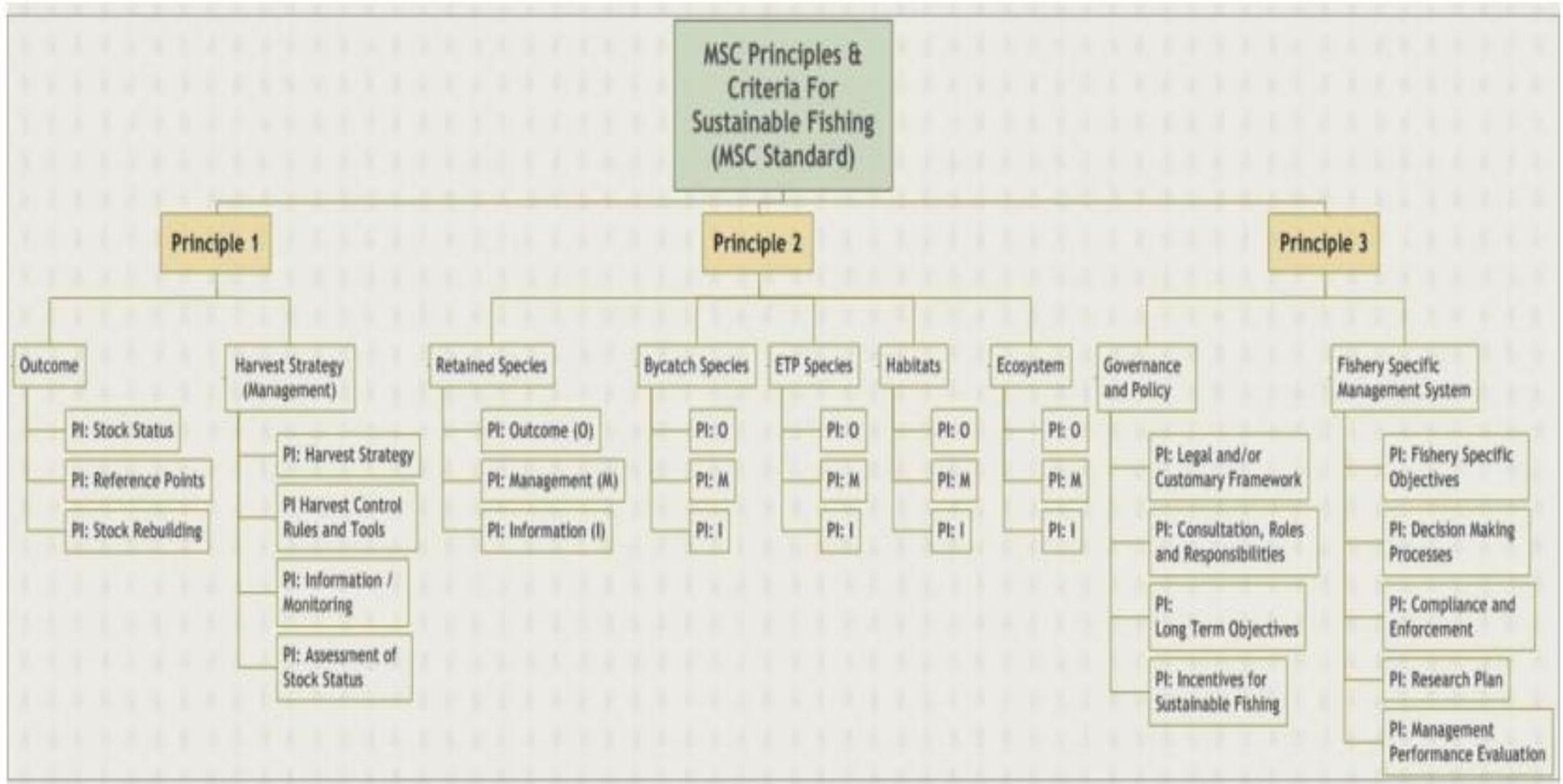
8. incorporate a research plan - appropriate to the scale and intensity of the fishery – that addresses the information needs of management and provides for the dissemination of research results to all interest parties in a timely fashion;
9. require that assessments of the biological status of the resource and impacts of the fishery have been and are periodically conducted;
10. specify measures and strategies that demonstrably control the degree of exploitation of the resource;
11. contains appropriate procedures to effective compliance, monitoring, control, surveillance and enforcement which ensure that established limits to exploitation are not exceeded and specifies corrective actions to be taken in the event that they are.

Operational Criteria

Fishing operations shall:

12. make use of fishing gear and practices designed to avoid the capture of non-target species (and non-target size, age, and/or sex of the target species); minimize mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive;
13. implement appropriate fishing methods designed to minimize adverse impacts on habitat, especially in critical and sensitive zones such as spawning and nursery areas;
14. not use destructive fishing practices such as fishing with poisons or explosives;
15. minimize operational waste such as lost fishing gear, oil spills, on-board spoilage of catch, etc.;
16. be conducted in compliance with the fishery management system and all legal and administrative requirements; and
17. assist and co-operate with management authorities in the collection of catch, discard, and other information of importance to effective management of the resources and the fishery.

MSC Current Scheme Documents	Version
MSC Fishery Standard - Principles and Criteria for Sustainable Fishing	1.1
MSC Certification Requirements	1.3
Guidance to MSC Certification Requirements	1.3
MSC Guidance to Certification Bodies on Stakeholder Consultation in Fishery Assessment	2
MSC Full Assessment Reporting Template	1.3



5.4 Evaluation Processes and Techniques

5.4.1 Site Visit

Initial consultation meetings were held in October 2014. The objectives of the consultation meetings were to provide information and understanding of the activities of the CAB and to discuss the fishery management organizational roles in the management of the lobster resources. The consultation meetings were designed to be inclusive of all organizations and representatives of the lobster fisheries. However, the consultation plan was designed to strategically capture sufficient information to ensure understanding and confidence with respect to full assessment scoring.

The on-site consultation also served other important functions. These included:

- Responding to questions and comments raised by participants in the fishery at this initial stage in the assessment.
- The client group provided information, documents, and a list of stakeholders as required by SAI Global. This served to allow the assessment team to collect general information on the fisheries, identify information gaps and identify key stakeholders for the information gathering exercise.
- Following the collection of general information on the fishery, a number of meetings with key stakeholders who expressed an interest to meet were scheduled by the team to fill in information gaps and to explore and discuss areas of concern.

Meetings were held in and are recorded in Table 13.

5.4.2 Consultations

Public announcements of the progression of the full assessment were made as follow:

Table 12. Stakeholder consultation/notification process.

Date	Purpose	Media
02/09/2014	Fishery enters full assessment	Notification on MSC website. Direct email/letter.
02/09/2014	Assessment Team nomination	Notification on MSC website.
18/09/2014	Assessment Team confirmation	Notification on MSC website.
18/09/2014	Use the Default Assessment Tree	Notification on MSC website. Direct email/letter.
18/09/2014	Site Visit scheduled	Notification on MSC website. Direct email/letter.
22/01/2015	Revised timeline	Notification on MSC website. Direct email/letter.
21/07/2015	New Assessment Team member, Additional stakeholder comment period, revised timeline	Notification on MSC website. Direct email/letter.
21/07/2015	VR and response	Notification on MSC website. Direct email/letter.
06/10/2015	Revised timeline	Notification on MSC website. Direct email/letter.

04/01/2016	Revised timeline	Notification on MSC website. Direct email/letter.
07/04/2016	Revised timeline	Notification on MSC website. Direct email/letter.
07/04/2016	Peer reviewers proposed	Notification on MSC website. Direct email/letter.
07/04/2016	VR and response	Notification on MSC website. Direct email/letter.
30/08/2016	PCDR issued	Notification on MSC website. Direct email/letter.
13/09/2016	Change of Target Eligibility Date	Notification on MSC website. Direct email/letter.

Table 13. Summary of consultation meetings during the October 2014 site visit.

Date	Organization	Location	Attendees	Overview/Key items
20th October 2014				
9.30 – 11.20 am	Client	Gloucester, ME	SAI assessment team John Whiteside Craig A. Rief	General information about the lobster fishery, retained and bycatch species, consultation and decision making processes, incentives for sustainable fishing, compliance
11.30 am – 1.00 pm	NMFS	Gloucester, ME	SAI assessment team John Whiteside Peter Burns Charles Lynch	Harvest strategy, HCRs, stock assessment, governance and policy, fishery specific objectives, decision making processes
2.00 -3.00 pm	ASMFC	Conference call	SAI assessment team John Whiteside Toni Kerns Jenny Nesslage	Stock assessment and status, reference points, harvest strategy, HCRs, information and monitoring, bycatch, governance and policy, fishery specific objectives, decision making processes, research plan
4.00 – 5.00 pm	The Human Society of the US	Conference call	SAI assessment team Sharon Young	Impacts on whales
21st October 2014				
8.30-10.30 am	GMRI	GMRI, Portland, ME	SAI assessment team Andrew Pershing Eric Weston Craig Rief Kyle Foley Jenny Sun	Traceability, assessment of stock status, HCRs, information and monitoring, habitat and ecosystem, governance and policy
11.30 am-12.30 pm	University of Maine	University of Maine, Orono, ME	SAI assessment team Rick Whale	Assessment of stock status, reference points, harvest strategy, HCRs, information and monitoring, habitat and

Date	Organization	Location	Attendees	Overview/Key items
				ecosystem, consultation and decision-making processes
1.00-4.00 pm	DMR	DMR offices, ME	SAI assessment team Craig Rief Deirdre Gilbert Eric Weston Erin Summers Sarah Cotnoir Colonel Joseph Fessenger Pat Kel Her Carl Wilson	Assessment of stock status, reference points, harvest strategy, HCRs, information and monitoring, retained and bycatch species monitoring, ETP species, habitat and ecosystem, governance and policy, fishery specific management system
22nd October 2014				
8.00 am-3.00 pm	University of Maine	University of Maine, Orono, ME	SAI assessment team Yong Chen Jim Wilson Bob Bayer Cathy Billingo Jim Acheson	Assessment of stock status, reference points, harvest strategy, HCRs, information and monitoring, ETP, habitats and ecosystem, consultation and decision-making processes
23rd October 2014				
1.00-4.00 pm	MA Division of Marine Fisheries	MA DMF offices, Boston, MA	SAI assessment team Robert Glenn Daniel McKiernan Tracy Ryd	Assessment of stock status, reference points, harvest strategy, HCRs, information and monitoring, retained and bycatch species, governance and policy, fishery specific management system
4.00-5.00 pm		Conference Call	SAI assessment team Bob Stenek	Assessment of stock status, reference points, information and monitoring, habitats and ecosystem
24th October 2014				
9.30-11.30 am	NMFS	NMFS, Woods Hole, MA	SAI assessment team John Whiteside Peter Corkeron Burton Shank Mike Palmer Loretta O'Brien	Assessment of stock status, reference points, HCRs, information and monitoring, retained and bycatch species, ETP species, consultation and decision-making processes
11.30 am-1.00 pm	Client (wrap-up meeting)	NMFS, Woods Hole, MA	SAI assessment team John Whiteside	Issues/gaps in information identified, next steps, timelines

5.4.3 Evaluation Techniques

Each PI under each Principle is weighted so that each of the three Principles is equal to one other.

At the Level of the Performance Indicator, the performance of the fishery is assessed as a 'score'. In order for the fishery to achieve certification, an overall weighted average score of 80 is necessary for each of the three Principles and no Indicator should score less than 60. Accordingly, 100 represents a theoretically ideal level of performance and 60 a measureable shortfall.

The Scoring Guideposts (SGs) identify the level of performance necessary to achieve 100, 80 (a pass score), and 60 scores for each Performance Indicator.

The scoring methodology is fully explained in the MSC Fisheries Assessment Methodology. It can be summarized as follow:

- Scoring is a qualitative process, involving discussion between team members and arrival at a joint agreed score. Scores should be normally assigned in divisions of 5 points
- The only narrative guidance that is available is at 60, 80 and 100 SGs. Intermediate scores must therefore reflect;
 - A failure to meet all the scoring issues⁴⁴ specified in a SG.
- The following system should then be used to determine the overall score for the PI from the scores of the different scoring issues. This system combines a primary approach based on the combination of scores achieved by the individual scoring issues (the a) to i) list below):
 - a) Score = 60: all issues meet SG60, and only SG60. Any scoring issues within a PI which fails to reach SG60, represents a failure against the MSC standard and no score shall be assigned.
 - b) 65: all issues meet SG60; a few achieve higher performance, at or exceeding SG80, but most do not meet SG80.
 - c) 70: all issues meet SG60; some achieve higher performance, at or exceeding SG80, but some do not meet SG80 and require intervention action to ensure they get there.
 - d) 75: all issues meet SG60; most achieve higher performance, at or exceeding SG80; only a few fail to achieve SG80 and require intervention action.
 - e) 80: all issues meet SG80.
 - f) 85: all issues meet SG80; a few achieve higher performance, but most do not meet SG100.
 - g) 90: all issues meet SG80; some achieve higher performance at SG100 but some do not.
 - h) 95: all issues meet SG80; most achieve higher performance, at SG100; only a few fail to achieve SG100.
 - i) 100: all issues meet SG100

⁴⁴ Scoring issues: The different parts of a single scoring guidepost, where more than one part exist covering related but different topics.

Table 14. Weights assigned to each component and PI within the Assessment tree structure

Principle	Wt (L1)	Component	Wt (L2)	PI No.	Performance Indicator (PI)	Wt (L3)	Weight in Principle		
One	1	Outcome	0.5	1.1.1	Stock status	0.5	0.25	0.333	0.1667
				1.1.2	Reference points	0.5	0.25		
				1.1.3	Stock rebuilding				
		Management	0.5	1.2.1	Harvest strategy	0.25	0.125		
				1.2.2	Harvest control rules & tools	0.25	0.125		
				1.2.3	Information & monitoring	0.25	0.125		
				1.2.4	Assessment of stock status	0.25	0.125		
		Two	1	Retained species	0.2	2.1.1	Outcome	0.333	0.0667
2.1.2	Management					0.333	0.0667		
2.1.3	Information					0.333	0.0667		
By-catch species	0.2			2.2.1	Outcome	0.333	0.0667		
				2.2.2	Management	0.333	0.0667		
				2.2.3	Information	0.333	0.0667		
ETP species	0.2			2.3.1	Outcome	0.333	0.0667		
				2.3.2	Management	0.333	0.0667		
				2.3.3	Information	0.333	0.0667		
Habitats	0.2			2.4.1	Outcome	0.333	0.0667		
				2.4.2	Management	0.333	0.0667		
				2.4.3	Information	0.333	0.0667		
Ecosystem	0.2			2.5.1	Outcome	0.333	0.0667		
				2.5.2	Management	0.333	0.0667		
				2.5.3	Information	0.333	0.0667		
Three	1	Governance and policy	0.5	3.1.1	Legal & customary framework	0.25	0.125		
				3.1.2	Consultation, roles & responsibilities	0.25	0.125		
				3.1.3	Long term objectives	0.25	0.125		
				3.1.4	Incentives for sustainable fishing	0.25	0.125		
		Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.2	0.1		
				3.2.2	Decision making processes	0.2	0.1		
				3.2.3	Compliance & enforcement	0.2	0.1		
				3.2.4	Research plan	0.2	0.1		
				3.2.5	Management performance evaluation	0.2	0.1		

6. Traceability

6.1 Eligibility Date

In accordance with CR Requirements *CR 27.6* MSC product eligibility date may be up to a maximum 6 months prior to the publication of the Public Comment Draft Report (PCDR). The client representative has indicated the client member groups desire to have the opportunity, if they so wish, to take full advantage of this 6 month period. The date was revised from a previous date to accommodate the identification of any existing lobster product from the under assessment fishery and held in frozen storage by supply chain entities that are already certified to the MSC Chain of Custody Programme. This product may become eligible for identification with an MSC claim on eventual certification of the fishery.

The initial proposed target eligibility date was the 28th October 2014 as the PCDR was initially scheduled to be published the 28th April 2015. The PCDR was published on the 30th August 2016, therefore the target eligibility date is now the 1st March 2016.

There is no risk of loss in the traceability, segregation and identification systems. As purchase slips and Federal logbooks contain the date of catch, the fishery and trade system can differentiate product from that sold prior to the 1st March 2016 and that sold from that date onwards.

6.2 Traceability within the Fishery

Traceability of fishing activity within this fishery is provided through implementation and enforcement of administrative measures. Only state and federally licensed vessels may participate in the fishery. Maine licensed vessels are not permitted to fish in other state waters or in Canadian waters. This is enforced through regular shore and at-sea inspections by DMRs' Division of Marine Patrol and Enforcement and the U.S. / Canadian Coastguard and regular patrols along the Maine / New Hampshire State and U.S. / Canada national boundaries.

The size of the vessels employed and the 'day trip' nature of the fishery ensure that the vast majority of vessels only fish within LCMA 1, i.e. the geographic extent of the unit of certification. Therefore the majority of the Maine licensed lobster vessels only catch lobster from LCMA 1 and the need for tracking, tracing or segregating systems for these vessels will not be necessary for those vessels operating only in LCMA 1. However, we were made aware that a few vessels are eligible and occasionally fish beyond the seaward extent of LCMA 2 and into LCMA 3. Given that this creates a potential risk that lobsters from the unit of certification could be mixed with lobster from outside, these vessels would need to implement systems to ensure that mixing of certified and non-certified does not take place.

The client group has confirmed that if one of their members with MSC chain of custody certification were to purchase lobster from one of the vessels eligible to fish in LCMA 3 the Captain of that vessel will be required to sign an affidavit annually confirming that any and all lobster from outside LCMA 1 has been placed in separate tagged crates. The affidavit would need to be made available to any CAB undertaking a chain of custody audit on a client group member and the vessel will also be required to demonstrate to the CAB that a system for separating lobster from outside of LCMA 1 is in place on the vessel.

A list of vessels that are eligible to fish outside of LCMA 1 will be included on the MSC website following successful certification of the fishery.

6.3 At-sea processing and transshipping

All lobsters are processed ashore. Transshipping is not allowed within the fishery.

6.4 Point of landing

There are many landing places throughout the State of Maine. The traceability of lobsters is provided by the mandatory requirement for dealers buying directly from vessels to report 100% of landings per trip on a harvester basis. This will ensure that lobster can be traced back to a Maine licenced lobster fishing vessel.

6.5 Eligibility to enter chains of custody

The scope of this fisheries certification ends at the first point of sale. MSC chain of custody starts at the first point of sale. The client group members need to be CoC certified and demonstrate they buy lobster directly from licensed vessels operating in the fishery, i.e. the first point of sale.

The client group (listed below) requires that the scope of the fishery certificate to extend to the point at which they take ownership of lobster from dealers as well as directly from licensed vessels.

SAI Global has reviewed the risks to traceability of lobsters to the certified fishery. Within the Maine Lobster fishery it is common practice for dealers to trade lobster from multiple vessels. As a result, lobster from different vessels may be mixed together. A small number of Maine vessels are licenced to fish in LCMA 2 and 3. This creates a potential risk for lobster caught outside of the unit of certification to be mixed with lobster from the certified fishery in LCMA 1. Therefore, if the client group members buy from a dealer there is a potential risk that their CoC will be compromised. In order to address this potential risk, client group members will need to:

- Have systems in place that will allow CoC auditors to trace the origin of the lobster purchased from dealers, including the vessels that contributed to the lot/batch/delivery provided by the dealer, the area from which the lobster was harvested, the date of landing, the place of landing (e.g. wharf) and landing receipts;
- Ensure that lots/batches/deliveries received from dealers that include lobster from any of the vessels licenced to harvest in LCMA 2 and 3 are kept separate from certified lobster and not labelled with the MSC logo;
- Maintain a current list of vessels licenced to fish outside the unit of certification and provide upon request at the time of a CoC audit.

With the above measures in place the scope of the fishery certificate can be extended to the point at which client group members take ownership of lobster harvested from LCMA 1. It should be noted that dealers are only able to trade in MSC certified lobster with client group members.

The client group members include:

Cozy Harbor Seafood, Inc.

Craig's All Natural, LLC
East Coast Seafood, LLC
Garbo Lobster, LLC
Inland Seafood
Chicken of the Sea Frozen Foods
Eastern Traders Ltd.
Maine Coast Shellfish LLC
Cape Bald Packers Ltd
D.C. Air & Seafood, Inc.

7. Evaluation Results

7.1 Principle level score

Table 15. Final Principle Scores

Final Principle Scores	
Principle	Score
Principle 1 – Target Species	85.6
Principle 2 – Ecosystem	81.3
Principle 3 – Management System	81.3

7.2 Summary of Scores

Score assigned to PIs are shown in Table 16.

Table 16. Performance Indicators scoring assigned to the GOM lobster trap fishery.

Principle	Wt (L1)	Component	Wt (L2)	PI No.	Performance Indicator (PI)	Wt (L3)	Weight in Principle	Score		
One	1	Outcome	0.5	1.1.1	Stock status	0.5	0.25	100		
				1.1.2	Reference points	0.5	0.25	80		
				1.1.3	Stock rebuilding	0.333	0.1667	NA		
		Management	0.5			1.2.1	Harvest strategy	0.25	0.125	85
						1.2.2	Harvest control rules & tools	0.25	0.125	65
						1.2.3	Information & monitoring	0.25	0.125	80
						1.2.4	Assessment of stock status	0.25	0.125	95
Two	1	Retained species	0.2	2.1.1	Outcome	0.333	0.0667	85		
				2.1.2	Management	0.333	0.0667	90		
				2.1.3	Information	0.333	0.0667	85		
		By-catch species	0.2			2.2.1	Outcome	0.333	0.0667	85
						2.2.2	Management	0.333	0.0667	80
						2.2.3	Information	0.333	0.0667	75
		ETP species	0.2			2.3.1	Outcome	0.333	0.0667	90
						2.3.2	Management	0.333	0.0667	85
						2.3.3	Information	0.333	0.0667	80
		Habitats	0.2			2.4.1	Outcome	0.333	0.0667	80
						2.4.2	Management	0.333	0.0667	60
						2.4.3	Information	0.333	0.0667	80
		Ecosystem	0.2			2.5.1	Outcome	0.333	0.0667	80
						2.5.2	Management	0.333	0.0667	80
						2.5.3	Information	0.333	0.0667	85
Three	1	Governance And policy	0.5	3.1.1	Legal & customary framework	0.25	0.125	85		
				3.1.2	Consultation, roles & responsibilities	0.25	0.125	85		
				3.1.3	Long term objectives	0.25	0.125	70		
				3.1.4	Incentives for sustainable fishing	0.25	0.125	90		
		Fishery specific	0.5			3.2.1	Fishery specific objectives	0.2	0.1	70
						3.2.2	Decision making processes	0.2	0.1	85

		management system	3.2.3	Compliance & enforcement	0.2	0.1	95
			3.2.4	Research plan	0.2	0.1	70
			3.2.5	Management performance evaluation	0.2	0.1	80

7.3 Summary of Conditions and Recommendation

Conditions

Table 17. Summary of Conditions

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/N/A)
1	The client must provide evidence that well-defined HCRs, taking into account main uncertainties, are in place and ensure that the exploitation rate is reduced as limit reference points are approached.	1.2.2	NA
2	The client must provide evidence that sufficient data continue to be collected to detect any increase in risk to main bycatch species.	2.2.3	NA
3	The client must provide evidence that a partial strategy is in place to ensure the fishery does not pose a risk of serious or irreversible harm to habitats, that there is some objective basis for confidence that the partial strategy will work, and that there is some evidence that the partial strategy is being implemented successfully.	2.4.2	NA
4	The client must provide documented evidence that clear long-term objectives for the GOM lobster fishery, which guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach and are explicit within management policy have been adopted.	3.1.3	NA
5	The client must provide documented evidence that the GOM lobster fishery has adopted short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 and are explicit within the fishery's management system have been adopted.	3.2.1	NA
6	The client must provide documented evidence that the GOM lobster fishery has a research plan that provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	3.2.4	NA

Recommendation

A recommendation is not obligatory and does not require a client action plan as for a condition. It means that it does not have to be implemented to maintain the certification. But the client is encourage to act upon within the spirit of the MSC certification.

The assessment team recommend that a reliable estimate of total fishing effort should be developed.

7.4 Determination, Formal Conclusion and Agreement

The Certification Committee of SAI Global has determined that:

- The **Gulf of Maine Lobster Fishery** is to be awarded certification to the Marine Stewardship Council Sustainable Fishing Standard.

SAI Global hereby publicly announces its intention to certify the Fishery Unit and upon issue of a certificate, the client shall have the right to claim the fisheries as a “well managed and sustainable fishery” in accordance with the MSC Principles and Criteria for Sustainable Fishing. Fisheries material thereof is deemed eligible for entry the MSC Chain of Custody according to requirements.

Client agreement (REQUIRED FOR PCR)

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List of websites

Atlantic States Marine Fisheries Commission
<http://www.asmfc.org/>

Maine Department of Marine Resources
<http://www.maine.gov/dmr/index.htm>

National Marine Fisheries Service Greater Atlantic Region
<https://www.greateratlantic.fisheries.noaa.gov/>

FAO species fact sheet
<http://www.fao.org/fishery/species/3482/en>

Appendices

Appendix 1 Scoring and Rationales

Appendix 1.1 Performance Indicator Scores and Rationale

Evaluation Table for PI 1.1.1

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Y	Y	Y
	Justification	<p>There is a high degree of certainty that the stock is above the point where recruitment would be impaired.</p> <p>Lobster landings in the GoM were stable between 1981 and 1989 averaging 14,600 mt, and then increased steadily from approximately 20,000 mt in early 1990s to approximately 35,000 mt in the mid-2000s. From 2007 to 2013 landings nearly doubled, reaching the time series high of 64,087 mt in 2013. Ten of the 11 highest lobster landings recorded in the GOM stock have occurred since 2003. Annual GoM landings have been in the upper quartile of the time series (1982-2013) since 2007. The dramatic increases in abundance are most likely to have been caused by ecological changes and will most likely only be sustained by continuation of the current ecological regime favouring high recruitment.</p> <p>Reference abundance and effective exploitation are used as interim reference points for the GoM lobster stock. Reference abundance is the number of lobster 78+ mm CL on January 1 plus the number that will molt and recruit into the 78+ mm CL group during the year. Effective exploitation is the annual catch (in number) divided by the reference abundance. Based on these reference points, a stock is considered “overfished” if model abundance is less than the 25th percentile relative to the 1982-2003 reference period. “Overfishing” would occur if exploitation is greater than the 75th percentile relative to the 1982-2003 reference period. In either of these cases, corrective management action should be implemented.</p> <p>The GoM stock is not depleted. The reference 2011 to 2013 abundance for the GoM was 247 million lobsters which is well above the threshold abundance of 52 million lobsters and the target abundance (75th percentile) of 103 million lobsters. Neither is overfishing occurring. The reference effective exploitation (2011-2013) was 0.48, which is below the threshold of 0.54.</p> <p>Mean spawning stock abundance indicators for the years 2008-2013 are positive (> 75th percentile). Given the high level of abundance, there is a high degree of certainty that the stock is above the point where recruitment would be impaired. However, young-of-year indices appear to be trending down. A recent pattern of low settlement indicates a potential for declines in recruitment in future years. Recent recruitment levels are at or near records levels Nevertheless, a Y for SG100 is justified.</p>		

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
b	Guidepost		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.
	Met?		Y	Y
	Justification	<p>There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.</p> <p>Lobster landings in the GoM were stable between 1981 and 1989 averaging 14,600 metric tons mt, and then increased steadily from approximately 20,000 mt in early 1990s to approximately 35,000 mt in the mid-2000s. From 2007 to 2013 landings nearly doubled, reaching the time series high of 64,087 mt in 2013. Ten of the 11 highest lobster landings recorded in the GOM stock have occurred since 2003. Annual GOM landings have been in the upper quartile of the time series (1982-2013) since 2007.</p> <p>The GoM stock is not depleted. The reference 2011 to 2013 abundance for the GOM was 247 million lobsters which is well above the threshold abundance of 52 million lobsters and the target abundance (75th percentile) of 103 million lobsters. Neither is overfishing occurring. The reference effective exploitation (2011-2013) was 0.48, which is below the threshold of 0.54.</p> <p>There is a high degree of certainty that the stock has been above its target reference point over recent years, justifying a score of 100 for SI b.</p>		
References		ASMFC 2015 ASMFC 2010a		
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 1.1.2

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Y	Y	

Justification	<p>Reference points are appropriate for the stock and can be estimated. Intended as interim until biological based reference points can be developed, the following reference points were adopted for the GoM in 2010: “Reference abundance” and “effective exploitation” would be the primary descriptors of annual abundance and annual fishing pressure (N and F reference point). Reference abundance is the number of lobster 78+ mm carapace length (CL) on January 1 plus the number that will molt and recruit to the 78+ CL group during the year. The 78 mm CL size was chosen because it is the lower end of the model size group that contains the lowest minimum legal size (81 mm or 3 ¼ inches) in all three stocks. Effective exploitation is the annual catch in number divided by the reference abundance.</p> <p>The stock is considered below the limit reference point (threshold), and overfished, if model abundance is less than the 25th percentile relative to the 1982-2003 reference period. Immediate action would be required if a stock were to fall below the 25th percentile. If the stock abundance is at or above the 75th percentile (green), a stock is considered in favorable condition.</p> <p>The exploitation reference point is designed to be a conditional target as exploitation has remained relatively stable over a wide range of abundance during the reference period. The stock is considered above the limit reference point (threshold), and overfishing is occurring, if exploitation is greater than the 75th percentile relative to the 1982-2003 reference period. Immediate action would be required if exploitation were to exceed the 75th percentile. If the stock exploitation is at or below the 25th percentile (green), a stock is considered in favorable condition.</p> <p>In the 2015 assessment, the Technical Committee considered a suite of standard and often-used biological reference points for lobster. These included F5%, F10%, F15%, F20%, FMAX, and F0.1 which were calculated using the UM model. These per-recruit reference points assume equilibrium conditions such as a constant rate of growth and a constant rate of natural mortality. The current rate of exploitation in the Gulf of Maine stock is above the threshold level for the entire suite of per-recruit reference points estimated and, by these metrics, overfishing is occurring. This seems implausible given the record abundance and recruitment observed in this stock over the last 20 years. The Review Panel, in fact, considered these per-recruit mortality-based reference points to be meaningless and possibly misleading.</p> <p>Uncertainty about the scale of fishing mortality estimates makes the use of absolute overfishing reference points problematic. The 2015 assessment demonstrated a strong relationship between annual recruitment and temperature thresholds defining optimal and stressful environmental conditions. These temperature regimes have undergone substantial systematic changes which directly affect natural mortality, rate of maturation, and rate of growth. Climate projections for the Northeast shelf predict that a continuation of environmental variability is a reasonable expectation. Therefore reference points that are based on hypothetical equilibrium conditions become unrealistic and unreliable management tools. An estimate of 100% MSP based on past data has little relevance to current or future conditions. As such the TC did not recommend the use of any of the biological based reference points. The Review Panel agreed with the SASC that traditional reference points, based on yield and spawning biomass per recruit and based on MSY considerations, are not appropriate given the life history and recruitment trends of lobster, and the current configuration of the per-recruit model. Instead, the Panel agreed with the choice of selected trend-based abundance and exploitation reference points determined from the model for an appropriate time period. Inherent in such an approach, however, is the assumption that the productivity currently supporting the fishery will be maintained. Nevertheless, these reference points are considered appropriate for the stock and can be estimated, justifying a score of 80 for Sla.</p> <p>Therefore the fishery does met 80a.</p>
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PI 1.1.2		Limit and target reference points are appropriate for the stock	
b	Guidepost		<p>The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.</p> <p>The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.</p>
	Met?		<p>Y</p> <p>N</p>
	Justification	<p>The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.</p> <p>A goal of the IFMP is to maintain a minimum stock size threshold ($\frac{1}{2} B_{msy}$ or a reasonable proxy thereof) at levels which would minimize risk of stock depletion and recruitment failure. Under current reference points (see SI a rationale above), the GOM lobster stock would be considered below the limit reference point (threshold), and overfished, if model abundance is less than the 25th percentile relative to the 1982-2003 reference period. This reference period includes a significant portion of the period of dramatically increasing abundance that started in 1988. In effect, the 25th percentile is intended to be applied as a limit reference point in the same way that 40% B_{msy} is applied in a more conventional PA framework.</p> <p>Point estimates of effective exploitation and reference abundance from the University of Maine (UM) assessment model are more reliable as trend indicators than as estimates in absolute terms. Uncertainties in estimates and/or reference points stem from several sources including growth parameters, natural mortality and recruitment dynamics at low or high stock sizes.</p> <p>The 2015 assessment explored several analyses to better characterize the inherent variance in growth and natural mortality rates which affect abundance and mortality estimates. In view of these issues, the UM model was used to evaluate stock status relative to trends during a reference period for each stock, but not relative to absolute abundance or exploitation-based reference points (e.g. B_{msy} or $F10\%$). The trend based reference points for lobster have proven robust over a wide range of assumptions about natural mortality and do not depend on the estimated scale of model estimates. However, the disadvantage of using trend based reference points is that there is no guarantee that percentile conditions in the early 1980s through 2003 are optimal threshold and target values. Also, the reference period used in this assessment (1982-2003 for GOM) is a relatively short time series and may not reflect an optimal and sustainable production range for the stock.</p> <p>A score of 80, but not 100, is justified for SI b.</p>	
c	Guidepost		<p>The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.</p> <p>The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.</p>
	Met?		<p>Y</p> <p>N</p>

PI 1.1.2		Limit and target reference points are appropriate for the stock	
	Justification	<p>The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome. A goal of the IFMP is to optimize yield from the fishery while maintaining harvest at a sustainable level. Exceeding the established fishing mortality threshold (F_{msy} or reasonable proxy) constitutes overfishing as defined by the IFMP. Also, under current reference points, abundance at or above the 75th percentile relative to the 1982-2003 reference period is identified as a target for the GOM lobster stock (refer to 4.3.4 Reference Points in Target Species Background). This reference period includes a significant portion of the period of dramatically increasing abundance that started in 1988. In effect, the 75th percentile is intended to be applied as an upper stock reference point in the same way that 80% B_{msy} is applied in a more conventional PA framework</p> <p>A score of 80 is justified for SI c but, given the uncertainties described in SI b rationale above, a score of 100 cannot be justified.</p>	
d	Guidepost		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.
	Met?		Not relevant
	Justification	<p>NA Lobster forage among a wide spectrum of plants and animals and are considered a keystone predator capable of driving the trophic dynamics in many benthic communities. Young lobsters, however, are preyed upon by a variety of species. Stomach sampling from a wide range of potential lobster predators in the GoM has shown that the percentage of lobsters by weight in the top 5 predators ranged from < 0.01 to 0.1% and ranked between 45 and 111 in prey occurrence. Lobsters are not important forage for any species</p>	
References	<p>ASMFC 2015 ASMFC 2010a</p>		
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 1.1.3

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success, are in place.		Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe.
	Met?	(Y/N)		(Y/N)
	Justification	The Gulf of Maine Lobster stock is not considered to be depleted.		
b	Guidepost	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the depleted stock.
	Met?	(Y/N)	(Y/N)	(Y/N)
	Justification	The Gulf of Maine Lobster stock is no considered to be depleted.		
c	Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within a specified timeframe.	There is evidence that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a specified timeframe.	
	Met?	(Y/N)	(Y/N)	

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe	
	Justification	The Gulf of Maine Lobster stock is no considered to be depleted.	
References		ASMFC 2015 ASMFC 2010a	
OVERALL PERFORMANCE INDICATOR SCORE:			NA
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 1.2.1

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Y	Y	N

PI 1.2.1	There is a robust and precautionary harvest strategy in place
	<p>The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.</p> <p>The ASMFC Lobster Management Board approved Amendment 3 to the IFMP in December 1997. The plan is designed to minimize the chance of population collapse due to recruitment failure. The goal of the amendment is to have a healthy lobster resource and management regime, which provides for sustained harvest, maintains appropriate opportunities for participation, and provides for cooperative development of conservation measures by all stakeholders. To achieve this goal, the plan adopts 11 objectives (see section 4.3.5), the following three of which, along with the foregoing, constitute the harvest strategy :</p> <ol style="list-style-type: none"> 1. Protect, increase or maintain, as appropriate, the brood stock abundance at levels which would minimize risk of stock depletion and recruitment failure; 2. Develop flexible regional programs to control fishing effort and regulate fishing mortality rates; <p>10. Optimize yield from the fishery while maintaining harvest at a sustainable level.</p> <p>Management measures include limited access licenses and trap limits, with maximum trap sizes and requirements for gear identification, escape vents and ghost panels. The main conservation measures include restrictions on harvest of lobsters smaller than minimum and larger than maximum carapace lengths, protection of berried (ovigerous) females and mandatory/voluntary practice of v-notching berried females.</p> <p>The GoM lobster stock is not depleted. The reference 2011 to 2013 abundance for the GOM was 247 million lobsters which is well above the threshold abundance of 52 million lobsters and the target abundance (75th percentile) of 103 million lobsters. Neither is overfishing occurring. The reference effective exploitation (2011-2013) was 0.48, which is below the threshold of 0.54. Under current stock conditions, the harvest strategy is clearly achieving objectives.</p> <p>However, abundance of the GoM lobster stock has increased dramatically since the late 1980s. These increases most likely were caused by ecological/environmental changes and current high abundance will most likely only be sustained by continuation of the ecological regime favouring high recruitment. As pointed out in 1.1.2 SI b above, the disadvantage of using trend based reference points is that there is no guarantee that percentile conditions in the early 1980s through 2003 are optimal threshold and target values. Also, the reference period used in the 2015 assessment (1982-2003 for GoM) is a relatively short time series and may not reflect an optimal and sustainable production range for the stock.</p> <p>The 1982-2003 reference period on which reference points are based includes a significant portion of the period of dramatically increasing abundance. The target abundance reference point is therefore high (conservative) relative to the low but stable abundance during the much less productive regime of the 1950 to late 1980s period. While all of the requirements necessary to achieve management objectives are in place, responsiveness of the harvest strategy in the face of declining productivity remains to be demonstrated.</p> <p>A score of 80, but not 100, can be justified for SI a.</p>

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
b	Guidepost	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	N
	Justification	<p>The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.</p> <p>Under the current high productivity ecological/environmental regime, the harvest strategy is clearly achieving management objectives (see SI a above). Abundance and exploitation reference points are in place to guide management decision making but whether objectives could be achieved under a declining productivity regime remains to be demonstrated.</p> <p>In 2006 the Review Panel raised concerns regarding effective management under declining recruitment: 1) A substantial risk that management measures intended to limit effort, or to make minor changes to legal sizes, may be ineffective in addressing stock collapse should recruitment decrease; and 2) The long time lag between the beginning of a persistent recruitment decrease and initiation of an effective management action.</p> <p>The SNE lobster stock has been at low levels of abundance and experiencing persistent low recruitment since 2002. It has been depleted since reference points were introduced in 2010. In a February 2012 Press Release, the American Lobster Board approved measures to reduce fishing exploitation on the stock by 10% starting in July 2013 in response to the stock's depleted condition. The 2011-2013 effective exploitation was 0.27, below the 0.41 threshold, yet the stock has not rebuilt since the last assessment and remains in very poor condition. Members of the Board believe that environmental and ecosystem changes have reduced the stock's ability to rebuild to historical levels. This experience serves to illustrate the realities of management in terms of responsiveness and effectiveness in the face of declining productivity.</p> <p>A score of 80, but not 100, can be justified for SI b.</p>		
c	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	Comprehensive monitoring of the fishery and the stock, involving collection of landings statistics, catch sampling, resource surveys, etc necessary for a periodic, rigorous, scientific assessment of stock abundance and exploitation, is conducted annually (see PI 1.2.3 and PI 1.2.4 evaluations below). This provides a sound basis for evaluating the harvest strategy. A score of 60 can be justified for SI c.		

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
d	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Y
	Justification	<p>The harvest strategy is periodically reviewed and improved as necessary. A comprehensive assessment of the GoM lobster stock is conducted at 5-year intervals. This includes a thorough review and evaluation of all aspects of the fishery and the resource during the intervening years. It provides a rigorous, scientific assessment of fishery performance and stock status indicators including model-based estimates of exploitation rate and abundance in relation to reference points. The assessment is the basis of harvest strategy evaluation and whether changes may be necessary to meet overall objectives.</p> <p>Also, a review and evaluation of the IFMP is conducted annually by the Plan Review Team. Included are the status of assessment advice, research and monitoring, management measures and issues, updates to stock and fishery performance indicators and compliance with management measures, monitoring and reporting requirements.</p> <p>A score of 100 can be justified for SI d.</p>		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification			
References	ASMFC 1997. ASMFC 2006. ASMFC 2010a. ASMFC 2010b. ASMFC 2015. www.asmfc.org/Fisheries Management/American Lobster/Management Plans & FMP Reviews www.asmfc.org/Fisheries Management/American Lobster/Press Releases			
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 1.2.2

PI 1.2.2		There are well defined and effective harvest control rules in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Y	N	
	Justification	<p>Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached. Specifically, Addendum XVI requires management action to rebuild the GoM lobster stock if it is depleted (overfished) as well as action to reduce exploitation if overfishing is occurring.</p> <p>The specifics of management measures vary between LCMAs. Effort is controlled by way of limited access licenses and trap limits, with maximum trap sizes and requirements for gear identification, escape vents and ghost panels. The main conservation measures include restrictions on harvest of lobsters smaller than minimum and larger than maximum carapace lengths, protection of berried (ovigerous) females and mandatory/voluntary practice of v-notching berried females.</p> <p>Abundance and exploitation reference points are in place to guide management decision making, however, predetermined management actions that would constitute well-defined harvest control rules have not been adopted for the GoM lobster fishery. A score of 60, but not 80, can be justified for SI a.</p>		
b	Guidepost		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	Met?		N	N
	Justification	<p>Abundance and exploitation reference points are in place and the model used to assess stock status incorporates a comprehensive treatment of estimation uncertainty. However, predetermined management actions that would constitute well-defined harvest control rules have not been adopted for the GoM lobster fishery and there is no risk analysis associated with the reference points to guide management decision making. Therefore, a score of 80 cannot be justified for SI b.</p>		

PI 1.2.2		There are well defined and effective harvest control rules in place		
c	Guidepost	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
	Met?	Y	Y	N
	Justification	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules. Effort is controlled by way of limited access licenses and trap limits, with maximum trap sizes and requirements for gear identification, escape vents and ghost panels. The main conservation measures include restrictions on harvest of lobsters smaller than minimum and larger than maximum carapace lengths, protection of berried (ovigerous) females and mandatory/voluntary practice of v-notching berried females. These tools have been effective in controlling exploitation. The reference effective exploitation (2011-2013) was 0.48, which is below the threshold of 0.54. Given the lack of harvest control rules and risk analysis associated with reference points, there is no clear evidence that the management system is prepared to maintain exploitation below the reference level if/when abundance declines from current high levels. A score of 80 can be justified for SIc, but not 100.		
References		ASMFC 1997. ASMFC 2010a. ASMFC 2015.		
OVERALL PERFORMANCE INDICATOR SCORE:				65
CONDITION NUMBER (if relevant):				1

Evaluation Table for PI 1.2.3

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	N

PI 1.2.3	Relevant information is collected to support the harvest strategy
Justification	<p>Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.</p> <p>The GoM lobster fishery is monitored by state agencies from Maine, New Hampshire and Massachusetts, as well as by NMFS through fishery-dependent and fishery-independent data collection. Details can be found in ASMFC 2015.</p> <p>Fishery-dependent data include:</p> <ul style="list-style-type: none"> - Vessel number/size, licences issued and traps fished annually, - Landings reports from dealers which became mandatory in 2004, - Port and sea sampling of commercial catches for size/sex composition and other biological information by various agencies for varying periods, - Sea sampling of commercial catch and effort by industry organizations (AOLA and CFRF). <p>Fishery-independent data include:</p> <p>Longstanding spring and fall stratified random bottom trawl surveys conducted on the continental shelf by NEFSC and inshore by NEAMAP and the states of Maine, New Hampshire and Massachusetts,</p> <p>A coast-wide, random stratified ventless trap survey initiated in 2006,</p> <p>A standardized diver-sampling survey of newly settled (YOY) lobsters conducted on cobble nurseries after the end of the settlement season in Maine and Massachusetts.</p> <p>In addition to the foregoing, ongoing monitoring of the fishery and the resource, there is a very extensive literature on all aspects of the life history, biology, ecology and population dynamics of the American lobster in the GoM. A great deal of the biological knowledge of the animal that has accrued from dedicated scientific research over an extended period is incorporated into stock assessment methodologies.</p> <p>However, the SASC has noted inconsistent quality of landings data spatially and temporally. While there is confidence in current landings data, there appears to have been significant underreporting during some periods of the time series used in the assessment which needs examination. Also, information to characterize fishing effort is limited. The only metric available broadly is total number of traps reported fished which does not provide a basis for a standardized CPUE index of abundance or a metric to determine the effect of effort reduction on stock status.</p> <p>Furthermore, the current high levels of fishing effort and harvest will not be sustainable if the present high productivity recruitment regime shifts to a less productive one. To provide reliable forecasting, there is a need for better understanding of the relationship between environmental drivers (temperature) and recruitment, to enhance predictive capabilities of YOY indices and to incorporate environmental data into population modelling.</p> <p>While sufficient information is available to support the harvest strategy, it cannot be considered comprehensive. Therefore, a score of 80, but not 100, can be justified for SI a.</p>

PI 1.2.3		Relevant information is collected to support the harvest strategy		
b	Guidepost	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
		Met?	Y	Y
	Justification	<p>Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.</p> <p>The GoM lobster fishery is monitored by state agencies from Maine, New Hampshire and Massachusetts, as well as by NMFS through fishery-dependent and fishery-independent data collection. Details can be found in ASMFC 2015.</p> <p>Fishery-dependent data include:</p> <ul style="list-style-type: none"> - Vessel number/size, licences issued and traps fished annually, - Landings reports from dealers which became mandatory in 2004, - Port and sea sampling of commercial catches for size/sex composition and other biological information by various agencies for varying periods, - Sea sampling of commercial catch and effort by industry organizations (AOLA and CFRF). <p>Fishery-independent data include:</p> <p>Longstanding spring and fall stratified random bottom trawl surveys conducted on the continental shelf by NEFSC and inshore by NEAMAP and the states of Maine, New Hampshire and Massachusetts,</p> <p>A coast-wide, random stratified ventless trap survey initiated in 2006,</p> <p>A standardized diver-sampling survey of newly settled (YOY) lobsters conducted on cobble nurseries after the end of the settlement season in Maine and Massachusetts.</p> <p>The periodic assessment of stock status in relation to reference points is sound and robust to inherent uncertainties in data used. While reference points were adopted in 2010 to guide management decision making, harvest control rules have not been established. The 2015 assessment demonstrated that the stock is well above target abundance and effective exploitation is below the threshold, thus no management action is required. Current fishing effort and harvest levels will not be sustainable if the current high productivity recruitment regime declines to a less productive one. The robustness of the management system in relation to uncertainties associated with forecasting recruitment or indeed responding to declining recruitment if it occurs remains to be demonstrated.</p> <p>A score of 100 cannot be justified for SI b.</p>		

PI 1.2.3		Relevant information is collected to support the harvest strategy		
c	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		y	
	Justification	<p>Traps are the predominant gear type in the U.S. lobster fishery, accounting for an average of 96% of the total landings between 1981 and 2013. Other gears accounting for the remainder include otter trawl, gill net, and dredge. These all have licensing and reporting requirements that provide a basis for estimating their removals. While the SASC has noted inconsistent quality of landings data spatially and temporally, which appears to have resulted in significant underreporting during some periods of the time series used in the assessment, there is confidence in current landings data.</p> <p>There is a lobster recreational fishery that generally amounts to less than 1% of total landings by state.</p> <p>A score of 80 is justified for SI c.</p>		
References		ASMFC 2015		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 1.2.4

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		Y	Y

PI 1.2.4		There is an adequate assessment of the stock status		
b	Justification	<p>The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.</p> <p>The University of Maine Stock Assessment Model (UMM) for American lobster was the only analytical model used in the 2015 assessment of GoM lobsters. It was modified by the Lobster Stock Assessment Subcommittee to estimate sex-specific size distributions for new recruits, separate recruitment parameters for females and males in each year, accommodate nonlinear surveys (exponential or saturating relationships), calculate per recruit models more accurately, estimate growth transition matrices internally from tag data, calculate variances for recruitments and survey trends internally so that data are self-weighted, and model expected recruitments using recruit covariates.</p> <p>“Reference abundance” and “effective exploitation” are used as the primary descriptors of annual abundance and annual fishing pressure when presenting assessment model results. In addition to these model estimates, a number of empirical stock indicators are examined to judge stock status. These provide information about the overall health of the stock independent of the assessment model. Three categories of indicators are generated: mortality, abundance, and fishery performance.</p> <p>Model inputs from ongoing monitoring include data on landings from dealers compiled in the National Marine Fisheries Service (NMFS) weighout and canvass database by port and month, data from port and sea sampling of catches by NMFS and agencies of the states of Maine, New Hampshire and Massachusetts as well as sea sampling conducted by the Atlantic Offshore Lobstermen’s Association and the Commercial Fisheries Research Foundation, and data from spring and fall random stratified bottom trawl surveys conducted by the federal and state agencies mentioned above. The model also utilizes available information on lobster population biology and dynamics coming from longstanding research programs focused on its life history and ecology.</p> <p>The assessment of the GoM lobster stock has undergone considerable model development and been subjected to rigorous scientific review over the years. The assessment is thorough and comprehensive and is considered appropriate for the stock and to take into account the major features relevant to the biology of the species and the nature of the fishery. A score of 100 can be justified for SI a.</p>		
	Guidepost	The assessment estimates stock status relative to reference points.		
	Met?	Y		
	Justification	<p>The assessment estimates stock status relative to reference points.</p> <p>Reference points based on abundance and effective exploitation relative to the 1982-2003 reference period have been established for the GoM lobster stock (see 1.1.2 SI a rationale above). The 2015 assessment showed stock status to be very favourable: the reference 2011 to 2013 abundance was 247 million lobsters, which is well above the threshold abundance of 52 million lobsters and the target abundance of 103 million lobsters, and the reference effective exploitation (2011-2013) was 0.48, which is below the threshold of 0.54 (see 1.1.1 SI a rationale above).</p> <p>A score of 60 is justified for SI b.</p>		

PI 1.2.4		There is an adequate assessment of the stock status		
c	Guidepost	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Y	Y	N
	Justification	<p>The assessment takes uncertainty into account. Sensitivity analyses are the primary measure of uncertainty in the 2015 stock assessment. In lieu of conventional uncertainty calculations, the range of estimates from sensitivity analysis was used to characterize uncertainty in reference abundance and effective exploitation.</p> <p>The assessment also included a likelihood profile analysis to examine the effects of variation in average recruitment over a range from 0.8 to 1.2 times the basecase level. The purpose of this analysis is to determine which data sets in the model support abundance estimates for recent years that are higher or lower than basecase estimates and to understand how each data set affects model results.</p> <p>Basecase reference abundance and effective exploitation estimates in the 2015 assessment and estimates from ASMFC (2009) were compared to evaluate the historical stability of assessment estimates over time. Stability in scale (the level of estimated abundance and exploitation) and trend (changes over time) were evaluated. The basecase model was rerun sequentially omitting one year of data to evaluate its stability. Results indicate a mild retrospective pattern, suggesting that the estimated trend and scale for recent years are stable.</p> <p>Abundance and exploitation reference points are in place and the model used to assess stock status incorporates a comprehensive treatment of uncertainty. However, inherent in the trend-based reference point approach is the assumption that the productivity currently supporting the fishery will be maintained. This assumption has no scientific basis. The assessment provides no projections based on recruitment prediction or analysis of risk associated with current harvest levels to guide management decision making.</p> <p>While the assessment takes uncertainty into account it does not evaluate stock status relative to reference points in a probabilistic way. A score of 80, but not 100, can be justified for SI c.</p>		
d	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			Y

PI 1.2.4		There is an adequate assessment of the stock status	
	Justification	<p>The assessment of the GoM lobster stock has undergone considerable model development and been subjected to rigorous scientific review over the years.</p> <p>The Collie-Sissenwine model (CSM) was used in the 2006 assessment. This relative abundance-based model has been used in assessments of numerous fisheries, including several other crustacean fisheries since it was first developed in 1983. In the 2009 assessment, results from the CSM and a statistical catch-at-length model developed at the University of Maine over the previous decade were presented and results compared. The 2009 Review Panel concluded that the length-based model provided a reliable, scientifically-sound foundation for lobster assessment work. This model uses a rigorous statistical approach to integrate different data streams and yields reliable estimates of the previous history and current status of a lobster stock. This latter model was the only one used in the 2015 assessment. As is shown in SI c rationale above, the assessment using this model is subjected to a very rigorous consideration of uncertainty.</p> <p>It is clear that the assessment has been tested and shown to be robust and that alternative hypotheses and assessment approaches have been rigorously explored. A score of 100 for SI d can be justified.</p>	
e	Guidepost	The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?	Y	Y
	Justification	<p>The 2015 American Lobster Benchmark Stock Assessment occurred through an Atlantic States Marine Fisheries Commission (ASMFC) external peer review process. ASMFC organized and held a Data Workshop on November 19-21, 2013 and three subsequent Assessment Workshops on September 22-25, 2014, February 10-12, 2015, and April 29-May 1, 2015. Participants of the Data and Assessment Workshops included the ASMFC American Lobster Stock Assessment Subcommittee and Technical Committee. ASMFC coordinated a Peer Review Workshop for the American Lobster Assessment on June 8-11, 2015. Participants included members of the American Lobster Assessment Subcommittee and a Review Panel consisting of three external reviewers appointed by ASMFC.</p> <p>The Peer Review Report provides a detailed evaluation of how each Term of Reference was addressed by the Stock Assessment Subcommittee, including the Panel's findings on stock status and future research recommendations.</p> <p>The Stock Assessment Report for Peer Review describes the background information on data used, and analysis for the assessment submitted by the Stock Assessment Subcommittee to the Review Panel.</p> <p>A score of 100 can be justified for SI e.</p>	
References	ASMFC 2006 ASMFC 2009 ASMFC 2015		
OVERALL PERFORMANCE INDICATOR SCORE:			95
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 2.1.1

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	Y	Y	Y Atlantic herring Y redfish N crab species N Atlantic menhaden N skate
	Justification	<p>The main retained species is the Atlantic herring used as bait. Minor species are landed crabs (rock crabs and Jonah crab) and other species such as redfish, Atlantic menhaden and skate used as secondary bait.</p> <p>The latest stock assessment of herring, conducted by the Northeast regional Stock Assessment Workshop in 2015, indicates that herring is not overfished and overfishing is not occurring. SSB in 2014 is estimated at 623,000 mt, well above the SSB limit and target of 155,573 and 311,145 mt, respectively. Therefore there is a high degree of certainty that herring is within biologically based limits and fluctuating around the target reference point.</p> <p>Landings of crabs are market driven, and have recently decreased after a peak in 2002. The assessment team considered crab species as a minor retained species, as catches are less than 5% of the lobster total catch and it cannot be said crab species are high value. Crabs are not assessed, and no reference points are established. There is no estimate of total biomass of crabs in the GoM, in term of biomass available to the fishery or estimates of exploitation rates. But according to the NMFS, there is no sign suggesting a negative change in crab species abundance in the recent years and that harvest levels are causing any major problems for crab stocks. Therefore, SG80 is met but not SG100.</p> <p>An update of the Acadian redfish stock was conducted in 2012 as part of the 2012 NE Groundfish Updates Integrated Peer Review. The updated assessment results show that 2010 SSB= 314,780 mt and 2010 F=0.006 and the updated estimate of F50% (0.04) and the SSBMSY proxy (238,000 mt). Therefore there is a high degree of certainty that redfish is within biologically based limits and fluctuating around the target reference point.</p> <p>The last menhaden benchmark assessment occurred in 2014. The results indicated that the stock is not overfished and overfishing is not occurring. However the ASMFC Atlantic menhaden Technical Committee does feel that the current reference points are not appropriate and recommended to adopt a new set of reference points, with which the stock status for the base run still not overfished and overfishing is not occurring. Therefore, SG80 is met but not SG100.</p> <p>The skate stock status is based on trends in abundance from NMFS trawl surveys. According to the last stock assessment, winter skate and little skate are not overfished and overfishing is not occurring. However, there is of the lack of catch data for individual species. Therefore SG80 is met but not SG100.</p>		

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
b	Guidepost			Target reference points are defined for retained species.
	Met?			Y Atlantic herring Y redfish N crab species Y Atlantic mehaden Y skate
	Justification	Target reference points are defined for all retained species except for crabs.		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	NA	NA	
	Justification	Main retained species is herring which is not outside the limits. The latest stock assessment of herring, conducted by the Northeast regional Stock Assessment Workshop in 2015, indicates that herring is not overfished and overfishing is not occurring. SSB in 2014 is estimated at 623,000 mt, well above the SSB limit and target of 155,573 and 311,145 mt, respectively.		
d	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	The status of herring, redfish, menhaden and skate is known. The status of crabs is not well known. But according to the NMFS, there is no sign suggesting a negative change in crab species abundance in the recent years and that harvest levels are causing any major problems for crab stocks. Escape vent on traps allows smaller crab individuals to escape from traps and biodegradable panel prevents “ghost fishing”.		
References		NMFS 2014 NMFS 2015 SEDAR 2015		

PI 2.1.1	The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species
OVERALL PERFORMANCE INDICATOR SCORE:	<p>Herring: 100 Redfish: 100 Crab species: 80 Atlantic menhaden: 90 Skate species: 90</p> <p>MSC CR 27.10.7 .4 Table C2 shall be used to determine the overall score for the PI from the scores of the different scoring elements.</p> <p style="text-align: right;">PI Overall score: 85</p>
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 2.1.2

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	Y	Y	Y herring Y redfish Y menhaden Y skate N crab species
	Justification	<p>The main retained species is the Atlantic herring used as bait. Minor species are landed crabs (rock crabs and Jonah crab) and other species such as redfish, Atlantic menhaden and skate used as secondary bait.</p> <p>Formal strategies are in place for the species used as bait (herring, redfish, menhaden and skate), but not for crab species.</p> <p>Atlantic herring fisheries are managed under a joint ASMFC-New England FMC FMP implemented in 1993 and amended twice, and its associated addenda. Management measures include quotas, spawning closures, fishing season, “day out” provision and seasonal trawling prohibition in federal waters.</p> <p>Redfish fishery is managed by the New England FMC and the NMFS under Northeast multispecies FMP including days-at-sea, special management program, and sectors.</p> <p>The Atlantic menhaden fishery is managed under an ASMFC FMP implemented in 1981 and last amended in 2012. Skate species are managed under a Northeast Skate Complex Fishery Management Plan.</p> <p>Stocks assessment is carried out for bait species, and none of them is overfished and overfishing is not occurring.</p> <p>This is not a full strategy in place for crab species. Crabs are not assessed, and no references points are established. There is no estimate of total biomass of crabs in the GoM, in term of biomass available to the fishery or estimates of exploitation rates. However, a partial strategy is in place to protect the reproductive potential of both crab species. Escape vents allow females and small sized-males do escape from traps.</p> <p>All bait species meet SG 100, and both crab species SG 80.</p>		

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	Y herring Y redfish Y menhaden Y skate N crab species
	Justification	There is some objective basis for confidence that the partial strategy will work for both crab species. According to the NMFS, there is no sign suggesting a negative change in crab species abundance in the recent years and that harvest levels are causing any major problems for crab stocks. This is not a full strategy in place for crab species, preventing the fishery from meeting 100. Testing supports high confidence that the strategy will work for all bait species. Stocks assessment is carried out for bait species, and none of them is overfished and overfishing is not occurring.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y herring Y redfish Y menhaden Y skate N crab species
	Justification	There is some evidence that the partial strategy is being implemented successfully for both crab species. According to the NMFS, there is no sign suggesting a negative change in crab species abundance in the recent years and that harvest levels are causing any major problems for crab stocks. There is clear evidence that the strategy is being implemented successfully for bait species. Stocks assessment is carried out for bait species, and none of them is overfished and overfishing is not occurring.		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y herring Y redfish Y menhaden

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
				Y skate N crab species
	Justification	There is some evidence that the strategy is achieving its overall objective for all bait species. Stocks assessment is carried out for bait species, and none of them is overfished and overfishing is not occurring. There is no strategy in place to manage crab species.		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Just			
References		<p>Atlantic herring FMP http://www.asmfc.org/uploads/file/herringFMP93.pdf</p> <p>ASMFC news release_Development of a Jonah crab FMP_Oct 2014 http://www.asmfc.org/uploads/file/54525259pr41JonahCrabFMP_DraftAddXXIV.pdf</p> <p>Northeast multispecies FMP http://www.greateratlantic.fisheries.noaa.gov/sustainable/species/multispecies/index.html</p> <p>Atlantic menhaden http://www.asmfc.org/species/atlantic-menhaden</p> <p>Northeast Skate Complex IFP http://www.greateratlantic.fisheries.noaa.gov/sustainable/species/skate/</p>		
OVERALL PERFORMANCE INDICATOR SCORE:		<p>Herring: 100 Redfish: 100 Crab species: 80 Atlantic menhaden: 100 Skate species: 100</p> <p>MSC CR 27.10.7 .4 Table C2 shall be used to determine the overall score for the PI from the scores of the different scoring elements.</p> <p style="text-align: center;">PI overall score: 90</p>		
CONDITION NUMBER (if relevant):		NA		

Evaluation Table for PI 2.1.3

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	Y herring Y redfish Y menhaden N skate N crab species
	Justification	<p>Accurate and verifiable information is available on the catch of herring, redfish and menhaden and the consequences for the status of affected populations.</p> <p>Accurate and verifiable information is available on these species catches in the fisheries which provide bait to the GoM lobster fishery. Herring comprises nearly 90% of the bait used in Maine. Saila et al (2002) evaluated that lobster fishery uses a substantial quantity of bait, around 100,000 t/year.</p> <p>Skate does not meet SG 100 because of the lack of catch data for individual species.</p> <p>Catches of crabs are recorded, but are not available broken down by species, which prevent the fishery from meeting 100a. Landings of crabs were 1,383,996 lbs, 1,777,966 lbs, and 1,772,616 lbs in 2013, 2014 and 2015 (preliminary), respectively.</p>		
b	Guidepost	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	Y herring Y redfish N menhaden N skate N crab species

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
	Justification	<p>Information is sufficient to quantitatively estimate outcome status with a high degree of certainty for herring, redfish but not for menhaden, skate and crab species.</p> <p>The last menhaden benchmark assessment occurred in 2014. The results indicated that the stock is not overfished and overfishing is not occurring. However the ASMFC Atlantic menhaden Technical Committee does feel that the current reference points are not appropriate and recommended to adopt a new set of reference points, with which the stock status for the base run still not overfished and overfishing is not occurring.</p> <p>The skate stock status is based on trends in abundance from NMFS trawl surveys, but there is a lack of catch data for individual species.</p> <p>Catches of crabs are recorded, but are not available broken down by species. Information is available on the size at maturity of crab species.</p>		
c	Guidepost	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	Y herring Y redfish N menhaden N skate N crab species
	Justification	<p>Information is adequate to support a strategy to manage herring and redfish, and evaluate with a high degree of certainty whether the strategy is achieving its objective.</p> <p>The last menhaden benchmark assessment occurred in 2014. The results indicated that the stock is not overfished and overfishing is not occurring. However the ASMFC Atlantic menhaden Technical Committee does feel that the current reference points are not appropriate and recommended to adopt a new set of reference points, with which the stock status for the base run still not overfished and overfishing is not occurring.</p> <p>The skate stock status is based on trends in abundance from NMFS trawl surveys, but there is a lack of catch data for individual species.</p> <p>There is no strategy in place to manage crab species. Catches of crabs are recorded, but are not available broken down by species.</p>		
d	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y	Y herring

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
				Y redfish Y menhaden N skate N crab species
	Justification	Monitoring of herring, redfish and menhaden is conducted in sufficient details to assess ongoing mortalities to these species. Accurate and verifiable information is available on these species catches in the fisheries which provide bait to the GoM lobster fishery. Skate does not meet SG 100 because of the lack of catch data for individual species. Catches of crabs are recorded, but are not available broken down by species.		
References		NMFS 2014 NMFS 2015 SEDAR 2015		
OVERALL PERFORMANCE INDICATOR SCORE:				Herring: 100 Redfish: 100 Crab species: 80 Atlantic menhaden: 90 Skate species: 90 MSC CR 27.10.7 .4 Table C2 shall be used to determine the overall score for the PI from the scores of the different scoring elements. PI Overall score: 85
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 2.2.1

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	N cod N yellowtail flounder N witch flounder N cusk	N cod N yellowtail flounder N witch flounder N cusk	N cod N yellowtail flounder N witch flounder N cusk Y white hake Y spiny dogfish Y redfish Y pollock N sculpin

PI 2.2.1	The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
			N cunner

Justification	<p>According to DMR scientists met during the site visit, Federal observers data and data from Bannister et al 2013, at least 10 finfish species are recorded as bycatch, among which sculpin, cunner, cod, redfish, cusk, spiny dogfish, hake, flatfish, and pollock. All the bycatches are well below 5% of the lobster total catch.</p> <p>Although cod, cusk, yellowtail flounder and witch flounder catches represent less than 5% of the total catch, the assessment team considers these species as main bycatch species due to their vulnerability (MSC GCB3.5.2.).</p> <p>For GoM cod, the SSB in 2013 was estimated to be below 2,500 mt under both the M=0.2 and M-ramp model scenario, which are the lowest ever estimated and are at 4% or 3% of the SSB_{MSY} proxy (47,184 mt or 69,621 mt) in the M=0.2 or M-ramp models, respectively. The 2013 fully selected fishing mortality is estimated to be greater than 1.2 under both models which is more than 6 times greater than the FMSY proxy (0.18 for both models). Fishing mortality is near all time highs despite the fact that fishery catches are at the lowest levels in the time series. The Gulf of Maine cod stock is in poor condition.</p> <p>A declining of cusk population trend has been evident since the late 1960s. In 2004, NMFS made cusk a “species of concern”.</p> <p>On the 2015 updated assessment, Cape Cod-Gulf of Maine Yellowtail founder stock was found to be is overfished and overfishing is occurring. SSB in 2014 was estimated to be 1,695 mt which is 32% of the biomass target for an overfished stock (SSB_{MSY} proxy = 5,259). The 2014 fishing mortality (average for ages 4-5) was estimated to be 0.35 which is 125% of the overfishing threshold proxy (FMSY proxy = 0.28).</p> <p>On the latest stock assessment update, it was found that witch flounder continues to be overfished and overfishing is currently occurring. SSB in 2014 was estimated to be 3,129 mt which is 33% of the SSB_{MSY} proxy (9,473). The 2014 fully selected fishing mortality was estimated to be 0.428 which is 153% of the FMSY proxy (0.279).</p> <p>Minor retained species are spiny dogfish, redfish, pollock, white hake, sculpin, cunner and lumpfish.</p> <p>U.S. spiny dog fish, redfish and pollock fisheries are MSC certified.</p> <p>An update of the Acadian redfish stock was conducted in 2012 as part of the 2012 NE Groundfish Updates Integrated Peer Review. The updated assessment results show that 2010 SSB= 314,780 mt and 2010 F=0.006 and the updated estimate of F50% (0.04) and the SSB_{MSY} proxy (238,000 mt). Therefore there is a high degree of certainty that redfish is within biologically based limits.</p> <p>The pollock stock is not overfished. SSB₂₀₁₄ was estimated to be 198,847 mt under the base model and 57,327 mt under the flat sensitivity model which is 189% and 104% respectively of the biomass target. Therefore there is a high degree of certainty that pollock is within biologically based limits.</p> <p>The 2015 spiny dogfish stock assessment indicates that the resource continue to be in good condition, with spiny dogfish not overfished and not experiencing overfishing. Spawning biomass is estimated to be at 106% of the target. Therefore there is a high degree of certainty that spiny dogfish is within biologically based limits.</p> <p>The white hake stock assessment was updated in 2015. The white hake stock is not overfished and overfishing is not occurring. SSB in 2014 was estimated to be 28,553 mt which is 88% of the biomass target (32,550 mt). Therefore there is a high degree of certainty that white hake is within biologically based limits.</p> <p>Cunner and sculpins are non-commercial species for which there is not stock assessment but general information on biology and ecology and abundance is available. Although cunner and sculpins are abundant in the Gulf of Maine, there is no data available allowing to say that there is a high degree of certainty that those species are within biologically based limits.</p>
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PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
b	Guidepost	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y cod Y yellowtail flounder Y witch flounder Y cusk	Y cod Y yellowtail flounder Y witch flounder Y cusk	
	Justification	<p>Although cod, cusk, yellowtail flounder and witch flounder catches represent less than 5% of the total catch, the assessment team considers these species as main bycatch species due to the vulnerability of the species (MSC GCB3.5.2.). All these species are overfished and overfishing is occurring.</p> <p>Based on the nature of the lobster fishery, the assessment team considers that a partial strategy exists to ensure that the lobster fishery does not hinder the recovery of cod, cusk, yellowtail flounder and witch flounder. Lobster traps are not designed to catch fish and biodegradable panel is mandatory to prevent ghost fishing in the event of trap lost. There is evidence that this partial strategy works based on the fact that bycatch estimates are well below the 5% threshold, and the discard mortality rates associated with fishes caught in traps is considered to be low.</p>		
c	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	The status of cunner and sculpins is not well known. But cunner and sculpins are abundant in the GoM and there is no sign suggesting a negative change in their abundance. Escape vent on traps allows smaller individuals to escape from traps and biodegradable panel prevents “ghost fishing”.		
References		NFSC 2012 NFSC 2015 Palmer 2014 Zhang and Chen 2015 http://www.asmf.org/species/spiny-dogfish http://www.nefsc.noaa.gov/groundfish/operational-assessments-2015/Reports/2015_HKW_UNIT_RPT.pdf		

PI 2.2.1	The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups
OVERALL PERFORMANCE INDICATOR SCORE:	<p>Cod: 80, cusk: 80 Yellowtail flounder: 80; witch flounder: 80 Spiny dog fish: 100; redfish: 100 Pollock: 100; white hake: 100 Cunner: 80, sculpins: 80</p> <p>MSC CR 27.10.7 .4 Table C2 shall be used to determine the overall score for the PI from the scores of the different scoring elements.</p> <p>PI Overall score: 85</p>
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 2.2.2

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	N
	Justification	Based on the nature of the lobster fishery, the assessment team considers that a partial strategy exists to ensure that the lobster fishery does not hinder the recovery of cod, cusk, yellowtail flounder and witch flounder. Lobster traps are not designed to catch fish and biodegradable panel is mandatory to prevent ghost fishing in the event of trap lost. However, a N has been assigned to 100a as there is no full strategy in place for managing and minimizing bycatch.		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N
	Justification	There is some objective basis for confidence that the partial strategy will work. There is evidence that this partial strategy works based on the fact that bycatch estimates are well below the 5% threshold, and the discard mortality rates associated with fishes caught in traps is considered to be low.		
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations	
	Justification	There is some evidence that the partial strategy is being implemented successfully based on the fact that bycatch estimates are well below the 5% threshold, and the discard mortality rates associated with fishes caught in traps is considered to be low.	
d	Guidepost		There is some evidence that the strategy is achieving its overall objective.
	Met?		N
	Justification	There is no full strategy in place for managing and minimizing bycatch.	
References	NFSC 2012 NFSC 2015 Palmer 2014 Zhang and Chen 2015		
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 2.2.3

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	<p>Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.</p> <p>According to DMR scientists met during the site visit, Federal observers data and data from the DMR Lobster Sea Sampling Program, at least 10 finfish species are recorded as bycatch, among which sculpins, cunner, Atlantic cod, redfish, cusk, spiny dogfish, hake, flatfish, and pollock. Cod, cusk, yellowtail flounder and witch flounder are considered as main bycatch species.</p> <p>Table 5 and 8 in Section 4.4.2 presents the bycatch information from the Federal observers and the DMR Lobster Sea Sampling Program.</p> <p>A recent study from Zhang and Chen (2015) developed abundances indices for cod and cusk from bycatch data obtained from DMR lobster at-sea sampling program in 2006-2011. The results show that CPUEs calculated based on the sampled traps from lobster fishery at-sea sampling program were low; the average was two fish per 1,000 traps for each species.</p> <p>However, it cannot be said that accurate and verifiable information is available on the catch of all bycatch species, preventing the fishery from meeting 100a.</p>		
b	Guidepost	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	N
	Justification	Information is sufficient to estimate outcome status with respect to biologically based limits. Stock assessments of commercial species provide sufficient information to estimate outcome status with respect to biologically based limits. For non-commercial species such as cunner and sculpins, general information on biological characteristics, distribution and abundance is available.		
c	Guidepost	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch	
	Justification	<p>Information is adequate to support a partial strategy to manage main bycatch species.</p> <p>Stock assessments of commercial species provide sufficient information to estimate outcome status with respect to biologically based limits. Bycatch estimates are available from the Federal observer program, the VTR and the DMR Lobster Sea Sampling Program.</p> <p>For non-commercial species such as cunner and sculpin, general information on biological characteristics, distribution and abundance is available.</p> <p>However, it cannot be said that information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective, preventing the fishery from meeting 100c.</p>	
d	Guidepost		<p>Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).</p> <p>Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.</p>
	Met?		N
	Justification	<p>Although data on bycatch continue to be collected through the the Federal observer program, the VTR and the DMR Lobster Sea Sampling Program, the data are not regularly compiled and published. Furthermore, the assesement team considered that the data collected are not sufficient to detect any increase in risk to main bycatch species.</p> <p>Both Federal and State observer coverage is very low, less than 1%, although sampling is well distributed among seasons and fishing areas. NMFS scientist mentioned during the site visit that it's difficult to estimate net amounts of bycatches due to the lack of information on fishing effort. Expansion estimates from the Lobster Sea Sampling Program are not available at this time. A study of bycatch in Maine lobster fishery concluded that further research needs to be conducted in order to better understand the magnitude of finfish bycatch in lobster commercial fishery.</p>	
References	<p>NFSC 2012 NFSC 2015 Jenner et al 2015 Palmer 2014 Zhang and Chen 2015 K. Reardon, DMR, February 2016</p>		
OVERALL PERFORMANCE INDICATOR SCORE:			75
CONDITION NUMBER (if relevant):			2

Evaluation Table for PI 2.3.1

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y sei whale Y sperm whale Y harbour seal Y minke whale Y sea turtles Y humpback whale Y right whale Y blue whale Y fin whale	Y sei whale Y sperm whale Y harbour seal Y minke whale Y sea turtles Y humpback whale Y right whale Y blue whale Y fin whale	Y sei whale Y sperm whale Y harbour seal Y minke whale N sea turtles except Kempt's ridley turtle for wich it's Y N humpback whale N right whale Y blue whale N fin whale

Justification	<p>The effects of the GoM lobster fishery are known and are highly likely to be within limits of national and international requirements for protection of all ETP species.</p> <p>ETP species of concern with respect of the GoM lobster fishery are the north Atlantic right whale, humpback whale, sei whale, sperm whale, blue whale, fin whale, minke whale, harbour seal and sea turtles (section 4.4.3). The table below presents the PBR and the interaction level with all Canadian and US fisheries for each species. The PBR means the maximum number of animals, not including natural mortality that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.</p>		
	Species	PBR	Fishery-related serious injury and mortality (Combined Canada and US fisheries, 2008-2012)
	Northern right whale	0.9	3.65 per year
	Humpback whale	2.7	8.90 per year
	Fin whale	2.5	1.55 per year
	Blue whale	0.9	Unknown
	Sei whale	0.5	0.4 per year
	Sperm whale	3.6	None in US waters
	Minke whale	162	7.1
	Harbor seal	2,006	431 per year
<p>Based on the sei whale, sperm whale, and blue whale distribution, there is no to low overlap between the GoM lobster fishery and these whale species distribution. Therefore, the assessment team determined that there is a high degree of certainty that the effects of the GOM fishery on these whale species are within the national limits requirements.</p> <p>For the fin whale, the reported fishery-related serious injury and mortality is lower than the PBR. Fin whale appears to be less susceptible to entanglements in fishing gear, and noise pollution, seismic exploration and industrial development are considered to be the most important threat. The fishery related serious injury and mortality is close to the PBR and documented mortalities are likely to be lower of the actual number of entanglements related mortalities. Therefore, the assessment team determined that SG 80 is met but not SG100.</p> <p>For harbour seal and minke whale, the 2008-2012 average fishery-related mortality and serious injury, is very well below the PBR. Therefore, the assessment team determined that there is a high degree of certainty that the effects of the GoM fishery on the harbor seal and the minke whale are within the national limits requirements.</p> <p>From 2007-2011 and 2008-2012, lobster gear of US or undocumented origin was not recorded in any of serious injury/mortality to right whales. The annual average rate of documented serious injury/mortality events for right whales and humpback whales attributable to lobster gear is less than the PBR for both species. The most recent marine mammals SARs indicate that the level of serious injuries and mortalities of Gulf of Maine humpback whales attributable to U.S. commercial fisheries meets the level necessary to allow for growth to the optimum sustainable population level. The 2014 Biological Opinion concludes that no changes to the fishery are being proposed that would increase the potential for interaction between the US lobster fisheries and right whales and humpback whales. The revised recovery plan for right whale and the recovery plan for humpback whales states that the most significant need for right whale recovery is to reduce or eliminate deaths and injuries from anthropogenic activities, including from commercial fishing operations. The Gulf of Maine lobster fishery is complying with the requirements to reduce the take of whales. The ALWTRP was implemented in 1997 and measures implemented evolve to modify fishing operations/practices to reduce the risk of entanglements. Therefore, the assessment team determined that the effects of the GoM</p>			

PI 2.3.1		<p>The fishery meets national and international requirements for the protection of ETP species</p> <p>The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species</p>		
		<p>lobster fishery on right whale and the humpback are highly likely to be within the national limits requirements.</p> <p>The assessment team considers that the fishery does not met SG100 as the documented mortalities are likely to be lower of the actual number of entanglements related mortalities, and the 2014 Biological Opinion concludes that US lobster fisheries has the potential to seriously injured or kill an average of 3.25 and 9.05 right whales and humpback whales, respectively.</p> <p>The assessment team considers that the effects of the GoM lobster fishery on the green turtle, the leatherback turtle and the loggerhead turtle are highly likely to be within the national limits requirements. From 2002 to 2011, NMFS received 159 reports of sea turtles entangled in vertical lines from Maine to Virginia, with 147 events confirmed. Of the 147 confirmed events during this period, 133 events involved leatherbacks, 13 involved loggerheads, and 1 involved a green sea turtle. NMFS identified the gear type and fishery for 93 of the 147 confirmed events which included lobster in 51 events.</p> <p>NMFS anticipates that the continued operation of lobster fisheries in the whole Atlantic US may result in the incidental take of sea turtles as follows:</p> <ul style="list-style-type: none"> - For loggerhead turtles, the annual take of up to one individual, which may be lethal or non-lethal; - For leatherback turtles, the annual observed take of up to four individual, which may be lethal or non-lethal. <p>While sea turtle bycatch varies depending on the fishery, of all commercial fisheries operating along the east coast of the U.S., the Southeast shrimp trawl fishery affects more sea turtles than all other activities combined.</p> <p>Based on the primary range of the Kemp's ridley turtle and the absence of recorded entanglement in lobster traps, the assessment team determined that there is a high degree of certainty that the effects of the GoM fishery on the Kemp's ridley turtle are within the national limits requirements.</p>		
b	Guidepost	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y sei whale Y sperm whale Y harbour seal Y minke whale Y sea turtles Y humpback whale Y right whale Y blue whale Y fin whale	Y sei whale Y sperm whale Y harbour seal Y minke whale Y sea turtles Y humpback whale Y right whale Y blue whale Y fin whale	Y sei whale Y sperm whale Y harbour seal Y minke whale N sea turtles except Kemp's ridley turtle for wich it's Y N humpback whale N right whale Y blue whale N fin whale

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species	
		The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species	
	Justification	<p>Direct effects are highly unlikely to create unacceptable impacts to all the ETP species considered.</p> <p>Based on the sei whale, sperm whale, and blue whale distribution, there is no to low overlap between the GoM lobster fishery and these whale species distribution. The assessment team determined that there is a high degree of confidence that there are no significant detrimental direct effects of the fishery on these ETP species.</p> <p>For the fin whale, the reported fishery-related serious injury and mortality is lower than the PBR. Fin whale appears to be less susceptible to entanglements in fishing gear, and noise pollution, seismic exploration and industrial development are considered to be the most important threat.</p> <p>For harbour seal and minke whale, the 2008-2012 average fishery-related mortality and serious injury, is well below the PBR. The assessment team determined that there is a high degree of confidence that there are no significant detrimental direct effects of the fishery on these ETP species.</p> <p>According to the last marine mammals' stock assessment, the right whale shows a positive and accelerating trend in the population size. Similarly, the GoM humpback whale population is characterized by a positive trend. The most recent marine mammals SARs indicate that the level of serious injuries and mortalities of Gulf of Maine humpback whales attributable to U.S. commercial fisheries meets the level necessary to allow for growth to the optimum sustainable population level. NMFS 2014 Biological Opinion concludes that fishery interactions are not threatening the continued survival and recovery of the right whale and the humpback whale (p.146, 150, 161), the fishery meeting SG80.</p> <p>NMFS anticipates that the continued operation of lobster fisheries in the whole Atlantic US may result in the annual incidental take of one individual of leatherback and one individual of loggerhead, which may be lethal or non-lethal</p> <p>While sea turtle bycatch varies depending on the fishery, of all commercial fisheries operating along the east coast of the U.S., the Southeast shrimp trawl fishery affects more sea turtles than all other activities combined.</p> <p>The assessment team determined that direct effect are highly unlikely to create unacceptable impacts to green turtle, loggerhead, and leatherback.</p> <p>Based on the primary range of the Kemp's ridley turtle and the absence of recorded entanglement in lobster traps, the assessment team determined that there is a high degree of confidence that there are no significant detrimental direct effects of the fishery on THE Kemp's ridley turtle.</p>	
c	Guidepost		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.
	Met?		Y
	Justification	The 2014 NMFS biological opinion considered the potential indirect impact of the lobster fishery on ETP species, and concluded that there are no indirect effects to marine mammals or sea turtles.	
References		NMFS 2014 NMFS 2016 Waring et al 2014	

PI 2.3.1	<p>The fishery meets national and international requirements for the protection of ETP species</p> <p>The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species</p>
	Waring et al 2015
OVERALL PERFORMANCE INDICATOR SCORE:	<p>Sei whale: 100, harbour seal: 100 Sperm whale: 100, minke whale: 100 Humpback whale: 85, right whale: 85 Blue whale: 100; fin whale: 85 Leatherback : 85, loggerhead: 85 Green turtle: 85, Kemp’s ridley turtle: 100</p> <p>MSC CR 27.10.7 .4 Table C2 shall be used to determine the overall score for the PI from the scores of the different scoring elements.</p> <p>PI overall score: 90</p>
CONDITION NUMBER (if relevant):	NA

Evaluation Table for PI 2.3.2

PI 2.3.2		The fishery has in place precautionary management strategies designed to: <ul style="list-style-type: none"> • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place that minimise mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	N
	Justification	<p>There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.</p> <p>A recovery plan has been adopted for endangered species. These plans set the goals and objectives for the conservation and recovery of endangered species.</p> <p>NOAA Fisheries Service implemented in 1997 the ALWTRP to reduce injuries and deaths of large whales due to incidental entanglement in fishing gear. The ALWTRP is an evolving plan that changes as NOAA learns more about why whales become entangled and how fishing practices might be modified to reduce the risk of entanglement. It has several components including restrictions on where and how gear can be set; research into whale populations and whale behavior, as well as fishing gear interactions and modifications; outreach to inform and collaborate with fishermen and other stakeholders; and a large whale disentanglement program. The ALWTR team members include fishermen associations, Conservation/Environmental Groups, State and Federal Fishery resource Managers, Fishery Management Organizations and Academic/Scientific Groups.</p> <p>Although implemented to reduce injuries and deaths of large whales due to incidental entanglement, the ALWTRP also benefits to other marine mammals and sea turtles.</p> <p>However, the strategy cannot be considered to be comprehensive, preventing the fishery from meeting 100a. Recovery plan did not lead to any formal implementation of specific actions to reduce interactions and mortality to leatherback turtle. Also due to the low observer coverage, it is likely that unreported interactions with ETP species occur.</p>		

PI 2.3.2		<p>The fishery has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species. 		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Y	Y	N
	Justification	<p>There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved. Knowlton <i>et al</i> (2012) concluded from their analysis of entanglement scar rates over time that efforts made since 1997 to reduce right whale entanglement have not worked. Across all 8 species of large whales, there was no detectable change in causes of anthropogenic mortality over time (van der Hoop <i>et al.</i> 2012). Any positive impacts on whales from the ALWTRP measures would not be observed for some time in populations and were not included in the last marine mammals stock assessment report, therefore it cannot be said that a quantitative analysis supports high confidence that the strategy will work. However, according to the last marine mammals' stock assessment, the right whale shows a positive and slowly accelerating trend in the population size. Similarly, the GoM humpback whale population is characterized by a positive trend. NFMS 2014 biological opinion conclude that fishery interactions are not a threatening the continued survival and recovery of the right whale and the humpback whale (p.146, 150, 161).</p> <p>The assessment team determined that direct effects are highly unlikely to create unacceptable impacts to green turtle, loggerhead, and leatherback. Based on the primary range of the Kemp's ridley turtle and the absence of recorded entanglement in lobster traps, the assessment team determined that there is a high degree of confidence that there are no significant detrimental direct effects of the fishery on THE Kemp's ridley turtle. However, there is no quantitative analysis supports high confidence that the strategy will work.</p> <p>Therefore the assessment team concludes that the fishery meets SG80, but not SG100.</p>		
c	Guidepost		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N

PI 2.3.2		The fishery has in place precautionary management strategies designed to: <ul style="list-style-type: none"> • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species. 	
	Justification	<p>There is evidence that the strategy is being implemented successfully. Compliance with whale regulations is high. Enforcement data presented in Section 4.5.7 show that there are no violations of whale regulations.</p> <p>However, due to the absence of observer coverage, it is likely that unreported encounters with ETP species could occur, preventing the fishery from meeting 100c.</p>	
d	Guidepost		There is evidence that the strategy is achieving its objective.
	Met?		Y
	Justification	<p>There is evidence that the strategy is achieving its objective.</p> <p>According to the last marine mammals' stock assessment, the right whale shows a positive and slowly accelerating trend in the population size. Similarly, the GoM humpback whale population is characterized by a positive trend. NMFS 2014 biological opinion conclude that fishery interactions are not a threatening the continued survival and recovery of the right whale and the humpback whale (p.146, 150, 161).</p> <p>The assessment team determined that direct effect are highly unlikely to create unacceptable impacts to green turtle, loggerhead, and leatherback.</p> <p>Based on the primary range of the Kemp's ridley turtle and the absence of recorded entanglement in lobster traps, the assessment team determined that there is a high degree of confidence that there are no significant detrimental direct effects of the fishery on THE Kemp's ridley turtle.</p>	
References		NMFS 1991 NMFS 2005 NMFS 2014 NMFS 2016 Waring et al 2014 Waring et al 2015	
OVERALL PERFORMANCE INDICATOR SCORE:			85
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 2.3.3

PI 2.3.3		Relevant information is collected to support the management of fishery impacts on ETP species, including: <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	Y sei whale Y sperm whale Y harbour seal Y minke whale N sea turtles N humpback whale N right whale Y blue whale N fin whale
	Justification	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species. Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty, except for the humpback whale, right whale and sea turtles. Available information on interactions with marine mammals and sea turtles is summarized in 2.3.1 and 2.3.2 and in the section 4.4.3.		
b	Guidepost	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N
	Justification	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species. However it cannot be said that accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species, as it is likely that unreported interactions with ETP species could occur, both Federal and State observer coverage is low, and in most cases of interactions, the gear involved has not been identified.		

PI 2.3.3		Relevant information is collected to support the management of fishery impacts on ETP species, including: <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 		
c	Guidepost	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	Y	Y	N
	Justification	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species. Information is not sufficient to support a full strategy to manage impacts on ETP species. It is likely that unreported interactions with ETP species could occur, both Federal and State observer coverage is low, and in most cases of interactions, the gear involved has not been indentified.		
References		NMFS 2014 NMFS 2016 Waring et al 2014 Waring et al 2015		
OVERALL PERFORMANCE INDICATOR SCORE:		Sei whale: 85, harbour seal: 85 Sperm whale: 85, minke whale: 85 Humpback whale: 80, right whale: 80 Blue whale: 85; fin whale: 80 Sea turtles: 80 MSC CR 27.10.7 .4 Table C2 shall be used to determine the overall score for the PI from the scores of the different scoring elements. PI overall score: 85		
CONDITION NUMBER (if relevant):		NA		

Evaluation Table for PI 2.4.1

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	Y	N
	Justification	<p>The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.</p> <p>A study carried out by Chuenpagdee et al (2003) ranked fishing gears regarding their collateral impacts on bycatch and on habitats in U.S. each Fishery Management Council region. They found that traps have low and medium impacts on biological and physical component of habitat, respectively. Shester and Micheli (2011) quantify and compare the ecosystem impacts of four gears (lobster traps, fish traps, set gillnets, drift gillnets) used in small-scale fisheries of Baja California, Mexico, using at-sea observations and field experiments. Results indicated that traps caused minimal immediate damage to habitats. A study carried out by Fuller et al (2008) examined the ecological impacts of the most common types of fishing gear used in Canada and assessed the relative severity of these impacts to seafloor habitat and discarded bycatch of target and non-target species. They determined that traps used on the west and east coasts of Canada have a medium low impact on the seafloor and a medium impact on corals and sponges. They pointed out that inshore lobster traps are often smaller and lighter than fish traps so cause less damage. A study carried out by Eno et al (2001) examined the effect of fishing with crustacean traps on benthic species in Great Britain. Result indicated that habitats and their communities appeared relatively unaffected by lobster and crab potting.</p> <p>However, there is not specific evidence from habitat specific study in relation to the fishery that support the statement of SG100.</p>		
References		Chuenpagdee et al 2003 Eno et al 2001 Shester and Micheli 2011		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 2.4.2

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	N	N
	Justification	<p>There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.</p> <p>The Habitat Program of the ASMFC is a branch of the Interstate Fisheries Management Program (ISFMP), which serves to support and supplement the efforts of the ISFMP Policy Board, fisheries Management Boards and Technical Committees. The goal of the Habitat Program is to identify, enhance, and cooperatively manage vital fish habitat for conservation, restoration, and protection, and supporting the cooperative management of ASMFC and jointly-managed species.</p> <p>NOAA is required to describe and identify essential fish habitat (EFH) in their respective regions, to specify actions to conserve and enhance that EFH, and to minimize the adverse effects of fishing on EFH. Congress defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity."</p> <p>The National Fish Habitat Action Plan is a nationwide, partnership-based investment strategy to increase the return on fish habitat conservation efforts. The Action Plan encourages collaboration between public agencies, private organizations, and citizens to provide ecosystem-wide results. With a network of regional partnerships setting priorities based on scientific assessment and strategic planning, the Action Plan provides a framework for collaborative action to conserve habitats vital to coastal and marine fisheries.</p> <p>Impacts on habitats are limited by restricting the number and size of traps in use, and the number of fishermen. In addition, programs have been carried out to recover lost lobster traps. For example, during the 2010 gear recovery effort, more than 1,000 traps were recovered by 27 fishing vessels from three lobster conservation management zones.</p> <p>However it cannot be said that is a partial strategy is in place as there has apparently been no explicit consideration of potential habitat impacts of the fishery, and how fishing operations should be changed if the measures in place proved to be unsuitable for meeting SG80 for 2.4.1.</p>		
b	Guidepost	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	N	N

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types	
	Justification	<p>The measures are considered likely to work, based on plausible argument. Trap fisheries are generally considered to have slight impacts on the habitat. A study carried out by Chuenpagdee et al (2003) ranked fishing gears regarding their collateral impacts on bycatch and on habitats in U.S. each Fishery Management Council region. They found that traps have low and medium impacts on biological and physical component of habitat, respectively. Shester and Micheli (2011) quantify and compare the ecosystem impacts of four gears (lobster traps, fish traps, set gillnets, drift gillnets) used in small-scale fisheries of Baja California, Mexico, using at-sea observations and field experiments. Results indicated that traps caused minimal immediate damage to habitats. A study carried out by Fuller et al (2008) examined the ecological impacts of the most common types of fishing gear used in Canada and assessed the relative severity of these impacts to seafloor habitat and discarded bycatch of target and non-target species. They determined that traps used on the west and east coasts of Canada have a medium low impact on the seafloor and a medium impact on corals and sponges. They pointed out that inshore lobster traps are often smaller and lighter than fish traps so cause less damage. A study carried out by Eno et al (2001) examined the effect of fishing with crustacean traps on benthic species in Great Britain. Result indicated that habitats and their communities appeared relatively unaffected by lobster and crab potting.</p> <p>There is no partial strategy in place, preventing the fishery from meeting SG80 and 100.</p>	
c	Guidepost		There is some evidence that the partial strategy is being implemented successfully.
	Met?	N	N
	Justification	There is no partial strategy in place.	
d	Guidepost		There is some evidence that the strategy is achieving its objective.
	Met?		N
	Justification	There is no partial strategy in place.	
References		See section 4.4.4.	

PI 2.4.2	There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types	
OVERALL PERFORMANCE INDICATOR SCORE:		60
CONDITION NUMBER (if relevant):		3

Evaluation Table for PI 2.4.3

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	N
	Justification	<p>The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery. Habitats of the Gulf of Maine do not exist in isolation, a myriad of ecological relationships and oceanographic processes link them and each habitat functions as part of the larger Gulf of Maine landscape. The movement of water plays a major role in the interconnection of habitats by transporting nutrients, food, larvae, sediments, and pollutants among them. Some of the Gulf of Maine's habitats are relatively well known and scientific understanding of them has expanded in recent years. Other habitats such as cold-water corals have only recently been explored. This overview of habitats in the Gulf of Maine is categorised based on substrate type and sediment grain size (rocky habitats, sandy habitats, muddy habitats), the water column, and biogenic habitats (salt marshes, seagrass beds, kelp beds shellfish beds, cold-water corals).</p> <p>Maine DMR carried out a mapping of eelgrass meadows during 1993 to 1997, and again in the 2001 to 2010 time period. Eelgrass maps are available on the DMR websites, as well as maps of changes in eelgrass beds between 1992-98 and 2001-10.</p> <p>However, there is some uncertainty about whether sensitive habitats exist in deeper, lower-energy areas where the fishery operates, preventing the fishery from meeting SG 100.</p>		

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types		
b	Guidepost	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	N

PI 2.4.3	<p>Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types</p>
Justification	<p>Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.</p> <p>A study carried out by Chuenpagdee et al (2003) ranked fishing gears regarding their collateral impacts on bycatch and on habitats in U.S. each Fishery Management Council region. They found that traps have low and medium impacts on biological and physical component of habitat, respectively. Shester and Micheli (2011) quantify and compare the ecosystem impacts of four gears (lobster traps, fish traps, set gillnets, drift gillnets) used in small-scale fisheries of Baja California, Mexico, using at-sea observations and field experiments. Results indicated that traps caused minimal immediate damage to habitats. A study carried out by Fuller et al (2008) examined the ecological impacts of the most common types of fishing gear used in Canada and assessed the relative severity of these impacts to seafloor habitat and discarded bycatch of target and non-target species. They determined that traps used on the west and east coasts of Canada have a medium low impact on the seafloor and a medium impact on corals and sponges. They pointed out that inshore lobster traps are often smaller and lighter than fish traps so cause less damage. A study carried out by Eno et al (2001) examined the effect of fishing with crustacean traps on benthic species in Great Britain. Result indicated that habitats and their communities appeared relatively unaffected by lobster and crab potting.</p> <p>New England Fishery Management Council completed a detailed examination of impacts of fishing gear on Gulf of Maine bottom habitats (NEFMC 2011), using a vulnerability matrix (susceptibility x recovery), and based on a detailed literature review and professional judgement. This review concluded that trap gear has low impacts on bottom habitats (both geological and biological components), with “susceptibility” scoring below 1 on a scale of 4 (10% or less of habitat quality affected) and “recovery” times short (scoring below 1.5 on a scale of 4, or less than about 1.5 years).</p> <p>Information on lobster traps distribution from DMR surveys (2009 and 2010), show that fishing effort is concentrated inside the Maine State waters (within 3 miles), however substantial numbers of lines are found beyond 12 miles. The highest number of traps fished per fishermen is found in Federal waters, followed by the exempt waters, while the highest number of endlines per fishermen is in the exempt waters. The peak months for active fishermen in the exemption area is July and August, September through November for non-exempt state waters, and November through January in federal waters.</p> <p>However, whilst sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear, justifying a Y for 80b, there has been no direct testing by way of before-and-after-fishing comparison of the fishing grounds, preventing the fishery from meeting 100b.</p>

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types		
c	Guidepost		Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
	Met?		Y	N
	Justification	<p>The assessment team considers that sufficient data continue to be collected to detect any increase in risk to habitat. DMR carried out surveys to determine the distribution of fishing effort. Monitoring of trends in gear used, spatial and temporal distribution and changes in operations (ALWTRP measures) is improving, such as trends in impacts on habitats may be assessed in future.</p> <p>Although, changes in eelgrass beds over the time have been investigated by DMR, the assessment team did not find any formal documents describing the changes in overall habitat distribution over the time, preventing the fishery from meeting 100.</p>		
References		Chuenpagdee et al 2003 Eno et al 2001 Shester and Micheli 2011 http://www.maine.gov/dmr/rm/eelgrass/howmapped.htm http://www.maine.gov/dmr/rm/eelgrass/index.htm		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				NA

Evaluation Table for PI 2.5.1

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Y	Y	P

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function	
	Justification	<p>The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.</p> <p>Larvae lobster are omnivorous, they feed on zooplankton (copepods, crab larvae, eggs) and phytoplankton (diatoms, dinoflagellates and filamentous algae). Juveniles and adults are mainly carnivorous and prey on crab, small sea stars, lobster, marine worms, molluscs and fish. Rock crab is a key food resource for lobster. Grabowski et al (2009) examined the diet and growth of lobsters at different sites in Maine, U.S. and New Brunswick, Canada. The results suggested that the bottom-up forcing (food limitation) can have important consequence for lobster population dynamics and the productivity of lobster fisheries. At the contrary, a study based on local ecological knowledge (interviews of fishermen) suggested a top-down (predation) control mechanism of lobster populations in the Gulf of Maine.</p> <p>There is a large amount of literature that describing undesired effects of fishing on marine ecosystems. Fishing impacts include changes in size composition of target species, impacts on benthic communities, loss of diversity, disequilibrium of food web and impacts on habitats.</p> <p>The main impact of the fishery on target, retained, bycatch and ETP species, and habitats are identified and there is no indication that the fishery causes disruption to the ecosystem main structure and function. There is no indication that the fishery causes serious or irreversible harm to habitats. However, a partial score was assigned to 1SG00 as gaps in information on interactions with whales and habitats impacts have been identified.</p>	
	References	<p>Bianchi et al 2000 Boudreau and Worm 2010 Goñi 1998 Grabowski et al 2009</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			90
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 2.5.2

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	N
	Justification	<p>There is a partial strategy in place, if necessary.</p> <p>The assessment team could not find any concern indicating that the GoM lobster fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the fishery on target, bycatch and ETP species, and habitat are identified and there is no indication that the fishery causes disruption to the ecosystem main structure and function. The main conservation measures include restrictions on harvest of lobsters smaller than minimum and larger than maximum carapace lengths, protection of berried (ovigerous) females and mandatory/voluntary practice of v-notching berried females. A biodegradable panel is mandatory to prevent ghost fishing in the event of trap lost. NOAA Fisheries Service implemented in 1997 the ALWTRP to reduce injuries and deaths of large whales due to incidental entanglement in fishing gear. There is a comprehensive assessment of the target species, and information is available to show the impact on retained, bycatch and ETP species. There is no indication that the fishery causes serious or irreversible harm to habitats. However, there is no strategy that consists of a plan in place, preventing the fishery from meeting 100.</p>		
b	Guidepost	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	<p>The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem.</p> <p>This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.</p>
	Met?	Y	Y	N

	Justification	<p>The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.</p> <p>The assessment team could not find any concern indicating that the GoM lobster fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the fishery on target, bycatch and ETP species, and habitat are identified and there is no indication that the fishery causes disruption to the ecosystem main structure and function. There is a comprehensive assessment of the target species, and information is available to show the impact on retained, bycatch and ETP species. There is no indication that the fishery causes serious or irreversible harm to habitats.</p> <p>There is no strategy that consists of a plan in place, preventing the fishery from meeting 100.</p>		
c	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	N
	Justification	<p>The partial strategy is considered likely to work, based on plausible argument.</p> <p>The assessment team could not find any concern indicating that the GoM lobster fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the fishery on target, bycatch and ETP species, and habitat are identified and there is no indication that the fishery causes disruption to the ecosystem main structure and function. There is a comprehensive assessment of the target species, and information is available to show the impact on retained, bycatch and ETP species. There is no indication that the fishery causes serious or irreversible harm to habitats.</p>		
d	Guidepost		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y	N

Justification	<p>There is some evidence that the measures comprising the partial strategy are being implemented successfully.</p> <p>The assessment team could not find any concern indicating that the GoM lobster fishery causes any disruption of the key elements underlying ecosystem structure and function. The main impact of the fishery on target, bycatch and ETP species, and habitat are identified and there is no indication that the fishery causes disruption to the ecosystem main structure and function. There is a comprehensive assessment of the target species, and information is available to show the impact on retained, bycatch and ETP species. There is no indication that the fishery causes serious or irreversible harm to habitats.</p> <p>The main conservation measures include restrictions on harvest of lobsters smaller than minimum and larger than maximum carapace lengths, protection of berried (ovigerous) females and mandatory/voluntary practice of v-notching berried females. Escape vents and biodegradable panels are required on traps, it reduces non-target species catch and impacts from lost traps (“ghost fishing”). NOAA Fisheries Service implemented in 1997 the ALWTRP to reduce injuries and deaths of large whales due to incidental entanglement in fishing gear.</p>	
References	See Principle 2 background section	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 2.5.3

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	<p>Information is adequate to broadly understand the key elements of the ecosystem. The physical environment and the chemical environment including suspended particulate matter, nutrients, oxygen, organic carbon and contaminants in the GoM are studied and well known.</p> <p>The Gulf comprises a vibrant marine ecosystem with high biodiversity. About 3,317 species of flora and fauna can be found in the Gulf of Maine. The main groups and species found in the waters of the Gulf are: phytoplankton, zooplankton, macrophytes, benthic invertebrates, pelagic invertebrates, groundfish, pelagic fish (forage fish, large ichthyophagous fish species), birds, marine mammals and turtles.</p> <p>Larvae lobster are omnivorous, they feed on zooplankton (copepods, crab larvae, eggs) and phytoplankton (diatoms, dinoflagellates and filamentous algae). Juveniles and adults are mainly carnivorous and prey on crab, small sea stars, lobster, marine worms, molluscs and fish. Rock crab is a key food resource for lobster. Grabowski et al (2009) examined the diet and growth of lobsters at different sites in Maine, U.S. and New Brunswick, Canada. The results suggested that the bottom-up forcing (food limitation) can have important consequence for lobster population dynamics and the productivity of lobster fisheries. At the contrary, a study based on local ecological knowledge (interviews of fishermen) suggested a top-down (predation) control mechanism of lobster populations in the Gulf of Maine.</p>		
b	Guidepost	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	N

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem	
	Justification	<p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.</p> <p>Main impacts of the fishery on target, retained, bycatch and ETP species, and habitat are identified. There is a comprehensive assessment of the target species.</p> <p>However, there are some gaps in the information on impacts on ETP species, bycatch and there has been no direct impacts on habitats testing by way of before-and-after-fishing comparison of the fishing grounds. Therefore, main interactions between the fishery and ecosystem elements have not been fully investigated, preventing the fishery from meeting 100b.</p>	
c	Guidepost		<p>The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.</p> <p>The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.</p>
	Met?		Y
	Justification	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.	
d	Guidepost		<p>Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.</p> <p>Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.</p>
	Met?		Y
	Justification	<p>Sufficient information is not available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.</p> <p>Main impacts of the fishery on target, retained, bycatch and ETP species, and habitat are identified. However, there are some gaps in the information on impacts on ETP species, bycatch and there has been no direct impacts on habitats testing by way of before-and-after-fishing comparison of the fishing grounds, preventing the fishery from meeting SG100.</p>	

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem	
e	Guidepost	Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?	Y	N
	Justification	<p>Information is not sufficient to support the development of strategies to manage ecosystem impacts.</p> <p>Main impacts of the fishery on target, retained, bycatch and ETP species, and habitat are identified. However, there are some gaps in the information on impacts on ETP species, bycatch and there has been no direct impacts on habitats testing by way of before-and-after-fishing comparison of the fishing grounds, preventing the fishery from meeting SG100.</p>	
References	Boudreau and Worm 2010 Grabowski et al 2009 Chuenpagdee et al 2003 Eno et al 2001 Shester and Micheli 2011 ASMFC 2015 ASMFC 2010a NMFS 2014 Waring et al 2014 Waring et al 2015		
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 3.1.1

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and <u>organised and effective cooperation</u> with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Y	Y	N
	Justification	<p>There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.</p> <p>The management system for American lobster consists of the powers existing in the Atlantic States Marine Fisheries Commission (ASMFC) which assumed responsibility for preparing the Interstate Fishery Management Plan for American Lobster in 1994 and produced the first such plan in 1997. The legislative basis for this is the Atlantic Coastal Fisheries Cooperative Management Act (Atlantic Coastal Act) of 1993 which transferred management authority from the Federal Magnuson-Stevens Act (MSA). Regulations developed and approved by ASMFC are implemented by member states in their own waters and complimentary regulations are adopted by the National Marine Fisheries Service in the EEZ. In these two instances, both relevant state statutes and the federal fisheries management laws provide the basis for implementing the agreed management measures. States that do not comply with ASMFC rules are subject to sanction by the US Secretary of Commerce's closing the fishery in that states waters.</p> <p>Therefore, effective national and interstate legal arrangements exist that include binding cooperation with other parties. However, it appears the ASMFC does not have to meet the requirements of the MSA for precautionary management approaches in lobster management.</p>		

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
b	Guidepost	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.	The management system incorporates or subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.
	Met?	Y	Y	Y
	Justification	<p>The management system incorporates or subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.</p> <p>The ASMFC Charter requirement member states to adhere to management measures adopted for lobster in their waters. This adherence is enforced by the US Secretary of Commerce through a sanction procedure that includes a review and evaluation stage that allow non-complying states opportunity to correct regulatory deficiencies before the final sanction is applied. No state has yet had this final sanction of a fishery closure imposed as the review process has always resulted in eventual compliance.</p> <p>The state of Maine’s legal system allows individuals access to redress through the courts for unresolved disputes over fishery regulations or policy decisions. In the case of licence suspensions or revocations, a hearing before the Commissioner can be received. He may reinstate the license or certificate or reduce the suspension period if he is satisfied that to do so would be in the best interests of justice, except that he may not reduce suspensions set by statute.</p>		
d	Guidepost	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	Y	Y	N

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 	
	<p>Justification</p> <p>The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p> <p>Tribal fishing rights in the lobster fishery exist for four bands; these were achieved by special legislation in 1998 and 2013. There are still legal disputes between the Passamaquoddy Tribe and the state of Maine over how these rights should be regulated and managed. Therefore, it cannot be said that the management system formally commits to the legal rights to fish commercially or for social purposes created explicitly or established by custom. These were achieved after extensive negotiations and are still the subject of some dispute.</p>	
References	<p>ASMFC (1997). "Amendment 3 to the Interstate Fishery Management Plan For Lobster"</p> <p>ASMFC (2003). "Compact & Rules and Regulations"</p> <p>ASMFC (2013a). "Interstate Fisheries Management Program Charter and Section 4.5.1"</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		85
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 3.1.2

PI 3.1.2		<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	Y	Y	Y
	Justification	<p>Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.</p> <p>The overall consultation system for management of American lobster is extensive and multi-layered. Inter-state, federal and public consultation mechanisms exist at the ASMFC level. These are spelled out in on the ASMFC website where records of various decisions are documented. At the state of Maine level, an extensive process exists that starts with elected zonal councils and continues up to the level of the Commissioner of DMR and the State legislature through state-level advisory committees and the Standing Committee for Marine Resources. The roles, responsibilities and powers of all these groups are detailed on the DMR or State Legislature websites. Meeting agendas and minutes are usually available through the same sources.</p>		
b	Guidepost	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	Y	Y	N

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties.	
		The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties	
	Justification	<p>The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.</p> <p>The wide-ranging consultative and public hearing process that is used to develop and implement lobster management measures seeks and acquires all relevant information including local knowledge before decisions are finalized. It is not clear, however, that the management system explains whether all this information was, or was, not used.</p>	
c	Guidepost		<p>The consultation process provides opportunity for all interested and affected parties to be involved.</p> <p>The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.</p>
	Met?		<p>Y</p> <p>N</p>
	Justification	<p>The consultation process provides opportunity for all interested and affected parties to be involved.</p> <p>Membership on major state advisory committees provides for general public participation but have no specific provision for organized non-fishing industry groups. While there is a public comment component in the overall consultation process but is not quite the same as facilitating the involvement of all interested parties directly in the advisory committee system.</p>	
References		ASMFC (2013a). "Interstate Fisheries Management Program Charter and Section 4.5.2	
OVERALL PERFORMANCE INDICATOR SCORE:			85
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 3.1.3

PI 3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach		
Scoring Issue	SG 60	SG 80	SG 100

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach		
a	Guidepost	Long-term objectives to guide decision-making, consistent with the MSC Principles and Criteria and the precautionary approach, are implicit within management policy	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy.
	Met?	Y	P	N
	Justification	<p>A partial score has been assigned to this PI.</p> <p>The Program Goals of the ISFMP, spelled out in the Commission’s Charter, represent the overall fisheries management objectives of the ASMFC activities. These require the commission’s conservation programs and management measures to maintain stocks in an abundant and self-sustaining condition, to protect fish habitat, minimize waste and promote fairness and equity in access and allocation. However, there is no mention of precautionary approaches to management such as usually found in the use of reference points and pre-set harvest control rules. While many of the agreed lobster management measures are of a precautionary nature in that they protect the spawning component of the stock and control fishing effort, this is not the full precautionary approach as envisaged by the MSC Principles and Criteria.</p> <p>The management objectives that contained in the MSA are more consistent with MSC Principles. In addition, NMFS is required to comply with the requirements of the National Environmental Policy Act (NEPA) when completing or approving fisheries management plans. However, it does not have approval authority over lobster management plans or the development of lobster management policy and measures as these are now the sole purview of ASMFC.</p> <p>Finally, the stated purpose of Maine’s DMR does not contain specific long-term objectives that are consistent with MSC Principles and Criteria and the precautionary approach and guide lobster management policy.</p>		
	References	<p>ASMFC (2013a). “Interstate Fisheries Management Program Charter.</p> <p>NOAA Fisheries (2013b). “National Environmental Policy Act Compliance for Council-Initiated Fishery Management Actions under the Magnuson-Stevens Act.” @ http://www.nmfs.noaa.gov/sfa/laws_policies/msa/nepa.html</p> <p>NOAA Fisheries (2013c). “Our Mission”@ http://www.fisheries.noaa.gov/aboutus/our_mission.html</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				70
CONDITION NUMBER (if relevant):				4

Evaluation Table for PI 3.1.4

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices.
	Met?	Y	Y	P

PI 3.1.4	The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing	
	Justification	<p>The overall management system for Gulf of Maine Lobster has components that, in totality, contribute to sustainable fishing of that resource. The various ASMFC, NMFS and state management measures provide for resource conservation through the array of rules that limit the size of animals taken, protect fertile females, provide mechanisms for escape from lost traps and generally restrict wasteful fishing practices. Effort controls are exercised through trap limits (set democratically by zone in Maine) and a limited access licensing program that is slowly reducing the number of lobster enterprises (this also has zonal agreed trap reduction ratios, the key to limitation of entry). There is, however, no license transferability provision to permit inter-generational transfer of enterprises and no vessel replacement size limit.</p> <p>A widespread sense of stewardship has developed in the Maine lobster industry that supports conservation-oriented fishing behaviour with a high degree of compliance. Some of this is achieved through local customary practices that eliminate or reduce territorial competition and others that encourage increased local adherence to fishing rules.</p> <p>There are no financial assistance programs that specifically encourage increased effort or unsustainable practices. The various loan and related programs available to fishermen are available to all small business operations.</p> <p>There is no indication that a regular review of management policy or procedures is undertaken to specifically ensure they do not contribute to unsustainable fishing practices.</p> <p>The state of Maine has recently conducted “An Independent Evaluation of the Maine Limited Entry Licensing System for Lobster and Crab”. Amongst other things, this evaluation by the Gulf of Maine Research Institute (GMRI) concluded that:</p> <ul style="list-style-type: none"> • Latent or unused potential effort in exists in Maine’s lobster fishery in the form of unused but issued commercial licenses; issued trap tags that are not being fished; and the potential traps associated with licenses holders who do not currently buy their maximum allowable number of tags. • While the number of licenses has declined overall, the number of traps issued has increased. As well, fishing capacity has increased through larger vessels and more vessels with additional crew, so more pounds are harvested from those traps. Therefore, the current system is considered as not controlling effort effectively. The recent resource expansion has helped accommodate (if not contributed to) the additional effort. However, in a resource decline, the current system would not be able to respond fast enough to prevent economic if not biological overfishing. <p>This implies that further reductions of fishing effort would likely increase favourable conditions for the continuing sustainable fishing of Maine lobster.</p> <p>There is no indication that a regular review of management policy or procedures is undertaken to specifically ensure they do not contribute to unsustainable fishing practices, the fishery partially meets SG100.</p>
References	<p>Institute (GMRI 2012). “An Independent Evaluation of the Maine Limited Entry Licensing System for Lobster and Crab”</p> <p>Section 4.5.4 above and confirmation of lack of current financial subsidies received from officials during Site Visit meeting with DMR staff.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		90

PI 3.1.4	The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing	
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 3.2.1

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery's management system	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.
Met?		Y	P	N

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2	
	Justification	<p>Amendment 3 to the Interstate Fishery Management Plan for Lobster indicates “The plan, when fully implemented, is designed to minimize the chance of a population collapse due to recruitment failure. The goal of Amendment 3 is to have a healthy American lobster resource and a management regime which provides for sustained harvest, maintains appropriate opportunities for participation, and provides for cooperative development of conservation measures by all stakeholders. To achieve this goal, the plan adopts the following objectives:</p> <ol style="list-style-type: none"> 1) Protect, increase or maintain, as appropriate, the brood stock abundance at levels which would minimize risk of stock depletion and recruitment failure. 2) Develop flexible regional programs to control fishing effort and regulate fishing mortality rates; 3) Implement uniform collection, analysis, and dissemination of biological and economic information; improve understanding of the economics of harvest; 4) Maintain existing social and cultural features of the industry wherever possible; 5) Promote economic efficiency in harvesting and use of the resource; 6) Minimize lobster injury and discard mortality associated with fishing; 7) Increase understanding of biology of American lobster, improve data, improve stock assessment models; improve cooperation between fishermen and scientists; 8) Evaluate contributions of current management measures in achieving objectives of the lobster FMP; 9) Ensure that changes in geographic exploitation patterns do not undermine success of ASMFC management program; 10) Optimize yield from the fishery while maintaining harvest at a sustainable level; 11) Maintain stewardship relationship between fishermen and the resource <p>There are no lobster fishery specific objectives defined for the State of Maine's management of its lobster fishery. A management plan is in development at the state level that will likely rectify this shortfall.</p> <p>While the ASMFC's objectives for lobster fishery management might be acceptable as meeting some of the MSC requirements under SG 80, they do not directly address the precautionary approach nor ecosystem considerations and they are not explicit in the lobster fishery management system of the state of Maine at this time, the fishery partially meeting SG80.</p>	
References		ASMFC (1997). “Amendment 3 to the Interstate Fishery Management Plan For Lobster”, and Section 4.5.5	
OVERALL PERFORMANCE INDICATOR SCORE:			70
CONDITION NUMBER (if relevant):			5

Evaluation Table for PI 3.2.2

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
Scoring Issue	SG 60	SG 80	SG 100

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
a	Guidepost	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Y	Y	
	Justification	<p>There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.</p> <p>Under ASMFC, LCMTs composed of industry representatives from each management area, advise the Lobster Management Board of recommended changes to the management plan for their areas. This process starts with the identification of a problem by a species management board, as a result of new scientific research or through stakeholder input. Once a problem is identified the Lobster Board tasks the LCMT with the creation of management measures. The LCMT may seek assistance or input from the Technical Committee, Advisory Panel and the Law Enforcement Committee, as needed. The proposed management plan measure then is distributed for public comment and public hearings may be held in states with an interest in the fishery. Input is also sought from the technical committee, as appropriate, and the advisory panel. The Lobster Management Board considers the public comments received and the recommendations of the species technical committee and advisory panel during the deliberations for approval of the management program/measures. If the proposed program is approved by the Lobster Management Board, the involved states are required to implement the approved management measures in their jurisdiction. The NMFS will be requested to institute similar measures in the EEZ.</p> <p>The Atlantic Coastal Fisheries Act mandates that the Commission provide adequate public participation in its fisheries management planning process, including at least four public hearings (for amendments and new plans). It is also required to maintain procedures for submission of written comments to the Commission.</p>		
b	Guidepost	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Y	Y	N

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.			
	Justification	<p>Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.</p> <p>At the Maine State level, proposals for changes or additions to management measures for lobster may be initiated by DMR, one of the zonal advisory boards, the Lobster Advisory Council or even the State’s Legislature’s Joint Standing Committee on Marine Resources.</p> <p>If the proposal is for a state-level law or regulation it will be concluded by the state legislature enacting a new statute or by the DMR enacting a new or revised regulation. In the latter case, the DMR Advisory Council considers and votes on the regulatory proposal before it is passed. Most new regulatory proposals are subject to a public hearing process before a final decision is taken. Notices of the time, subject and place of public hearings are posted on the DMR website as are the final notices of rulemaking adoption of new or revised measures as well as the summary of public comments and DMR’s responses.</p> <p>If a proposal for a new or revised measure falls within the purview of ASMFC and garners enough support it would be taken by the LCMT for LCMA 1 and would then proceed through the ASMFC decision-making process described above.</p> <p>There is no evidence that indicates decision-making processes respond to all issues identified, preventing the fishery from meeting 100.</p>		
c	Guidepost		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Y	
	Justification	<p>Decision-making processes use the precautionary approach and are based on best available information.</p> <p>A formalized precautionary approach is not used in the management of Maine lobster. However, almost all of the various individual lobster management measures that are used are inherently precautionary in nature and almost definitely ensure survival of the lobster though the protection given to the breeding stock through minimum and maximum carapace size, the prohibition on berried females, mandatory “v-notching”, pot sizes and escape mechanisms etc. this suite of measures had been used for decades in both the US and Canada where all lobster fisheries have fared much better than all finfish species.</p>		

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
d	Guidepost	Some information on fishery performance and management action is generally available on request to stakeholders.	Information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Y	Y	Y
	Justification	Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. In Maine, most new regulatory proposals are subject to a public hearing process before a final decision is taken. Notices of the time, subject and place of public hearings is posted on the DMR website as are the final notices of adoption of new or revised measures as well as the summary of public comments and DMR's responses. The summary of DMR's responses to public comments and the associated notice of final decision constitute sufficient action to justify meeting SG 100 in this case.		
e	Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Y	Y	N

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.	
	Justification	<p>The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.</p> <p>There is high level of compliance with lobster fishery management rules coupled with a significant sense of stewardship for the resource. This indicates a high overall respect for the laws and regulations governing lobster fishing. The state’s legal system seems to respond to most legal and related challenges in a timely fashion as witnessed by the number fishery bills that may pass in any session of the legislature. The ongoing lobster fishery dispute with the Passamaquoddy Tribe seems to indicate the system does not always act proactively to avoid legal disputes or rapidly implement judicial decisions arising from legal challenges.</p> <p>There is however no clear information that indicates the fishery specific system responds in a timely manner while taking account of the wider implications of decisions. A fully formalized precautionary approach that includes reference points and HCRs is not in place. And there is some indication the system does not always actively to avoid some legal disputes. This PI is therefore assigned a score of 85.</p>
References	<p>ASMFC (2003). “Compact & Rules and Regulations”</p> <p>MITSC (2014): Special Report 2014/1, “Assessment of the Intergovernmental Saltwater Fisheries Conflict between Passamaquoddy and the State of Maine” Sections 4.5.6 and 4.5.7 as well as information from meeting with DMR staff during Site Visit.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		85
CONDITION NUMBER (if relevant):		NA

Evaluation Table for PI 3.2.3

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Y	Y	Y
	Justification	<p>The State of Maine has a dedicated and professional marine law enforcement division in DMR's Marine Patrol and Enforcement ("Marine Patrol"). The level of compliance is deemed to be exceptionally high. The level of compliance is judged by the results of boardings and is reported to regularly approach the 100% mark.</p> <p>The State's Marine Patrol has 40-45 officers who cover the lobster fishery in LCMA 1, which can extend beyond state waters. Vessels registered in the State of Maine are subject to Maine's fishery rules when fishing in the EEZ when state laws are more restrictive than those applied by NMFS. For that reason, Maine's Marine Patrol officers are deputized as federal special agents under a joint enforcement scheme.</p> <p>From January 1 to June 30, 2015, Marine Patrol Officers inspected vessels and licenses for the above-specified time, resulting in 20,636 hours of harvester enforcement, and 6,220 hours doing public health enforcement (closed areas, etc). The number of boats checked was 1,437. All boats checked were done in Marine Patrol vessels. The number of man hours and vessel hours combined in vessels under 26' were 940.5 man hours and 392.2 vessel hours. Man hours and vessel hours spent in vessels over 26' were 4,203 man hours and 1,550 vessel hours, along with 100 hours in the aircraft for the reporting period.</p> <p>The numbers of harvesters checked by Marine Patrol Officers during January 1, 2015 through Jun 30, 2015 were 5055.</p>		
b	Guidepost	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	Y	Y	N

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with	
	Justification	<p>Extensive sanctions for fishery violations are provided in Maine's Revised Statutes (Title 12, Parts 4 and 9) and the various regulations made as a result of enabling legislation. While penalties exist for various infractions, possible suspension or revocation of licence appears to be the most effective deterrent that exists. The Assessment Team was advised by the Commissioner, who had to hold a Licence Suspension Hearing during our Site Visit meeting, that this is a very effective means of achieving compliance because of the severe effects of being unable to fish that result.</p> <p>This is coupled with the efforts by Marine Patrol officers to seek compliance and craft relatively good relationships with industry. The Marine Patrol uses discretion in boarding and ticketing further improving this rapport and trust.</p> <p>Marine Patrol Officers issue summonses and warnings, based on their extensive knowledge of the area and local fishermen in that area. Officers try to work with fishermen to gain voluntary compliance. The total number of summonses and warnings issued by Marine Patrol Officers during this reporting period were as follows: 304 summonses issued and 530 warnings.</p> <p>The cases that were adjudicated from January 1 to June 30, 2015, were as follows: 158 cases were found guilty, 22 cases were in default, 10 were dismissed, all others were filed remain as open cases and have not yet been adjudicated.</p> <p>However, there is a lack of evidence that sanctions provide demonstrably effective deterrent, preventing the fishery from meeting SG100.</p>	
c	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.
	Met?	Y	Y
	Justification	<p>There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.</p> <p>As outlined to the Assessment Team during the Site Visit, the state Marine Patrol has developed a high level of personal connections with industry and a strong sense of trust. Marine Patrol officers are taught that seeking compliance is the main goal, and this has helped craft relatively good relationships with industry. The Marine Patrol uses discretion in boarding and ticketing further improving this rapport and trust. The director of the Marine Patrol has been on the law enforcement committee of the ASMFC for the past 15 years. This has contributed to the laws or rules that are passed being more enforceable.</p> <p>While compliance is viewed to be high there are always some infractions that are detected and prosecuted annually.</p>	
d	Guidepost		There is no evidence of systematic non-compliance.
	Met?		Y

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with	
	Justification	As outlined to the Assessment Team during the site Visit, the state Marine Patrol has developed a high level of personal connections with industry and a strong sense of trust. Marine Patrol officers are taught that seeking compliance is the main goal, and this has helped craft relatively good relationships with industry. The Marine Patrol uses discretion in boarding and ticketing further improving this rapport and trust. The director of the Marine Patrol has been on the law enforcement committee of the ASMFC for the past 15 years.	
References		Maine (2014a). "Department of Marine Resources, Chapter 25, Lobster and Crab Regulations" Section 4.5.7 and references cited there and information given by DMR staff during Site Visit meeting.	
OVERALL PERFORMANCE INDICATOR SCORE:			95
CONDITION NUMBER (if relevant):			NA

Evaluation Table for PI 3.2.4

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
Met?		Y	N	N

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
	Justification	<p>A wide range of multi-disciplinary research on American lobster and the fishery has been, and continues to be, conducted by government scientists, universities, various research institutes and organizations. These activities are especially evident in the case of the Maine lobster fishery and cover the physical and social science spectrum. Many initiatives are directly involved with the stock assessment process, especially model development and improvement. Others are directed at broader aspects of fisheries management issues, including the application of social science principles and analysis to increase the knowledge base for managing this fishery.</p> <p>At the ASMFC level, the ongoing reviews of the lobster fishing plan details a number of research priorities recommendations aimed at improving the overall fishery management effort. The 2013 Review of the 2012 fishery management plans contains eight recommendations on Research Needs and Program Research indicating priority areas for future research, analysis and investigation. As well, the 2009 stock assessment report contained 15 recommendations to improve the scope and quality of advice that is provided for management of this stock and fishery. These included a recommendation that "... a socio-economic study be implemented to determine the economic viability of effort reductions"</p> <p>As well, Special Report No. 89 of the Atlantic States Marine Fisheries Commission detailed species specific research needs and priorities in 2013. There is a section on lobster that outlines high, moderate or low priorities under the following categories: Fishery-Dependent Priorities, Fishery -Independent Priorities, Modeling/Quantitative Priorities, Life History, Biological, and Habitat Priorities and Management, Law Enforcement, and Socioeconomic Priorities.</p> <p>All these recommendations are meant to provide guidance to appropriate scientists from state organizations as well as those from NMFS in determining the focus of their research efforts. This is supplemented in the case of Maine by the research priority setting that is conducted there periodically. The most recent was the 2010 priority setting done in collaboration with the <u>Gulf of Maine Research Institute (GMRI)</u> and the <u>University of Maine Sea Grant Program</u>.</p> <p>The DMR has a 2010-2012 Research Plan which is intended to be a description of research, monitoring, restoration and outreach activities to be undertaken by the DMR with existing resources, not a comprehensive research plan that outlines all needed research. However, the plan does not include research on the impact of the lobster fishery on habitats and bycatch species and there is a lack of evidence that this plan has been extended after 2012 and is still in use, preventing the fishery from meeting SG 80 and 100.</p>		
b	Guidepost	Research results are available to interested parties.	Research results are disseminated to all interested parties in a timely fashion.	Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.
	Met?	Y	Y	N

PI 3.2.4		The fishery has a research plan that addresses the information needs of management	
	Justification	<p>The research results that are produced as a result of these planning efforts are readily available, upon completion, from the agencies or individual that undertook the tasks. Publication of reports is standard practice, with most reports or papers being available online through the ASMFC, DMR or other agency's website. Much of the annual research efforts is used in the ongoing monitoring reporting of fisheries by state scientists and enters into the formal lobster stock assessment exercise that is conducted every 5/6 years.</p> <p>However, the plan does not include research on the impact of the lobster fishery on habitats and bycatch species and there is a lack of evidence that this plan has been extended after 2012 and is still in use, preventing the fishery from meeting SG 100.</p>	
	References	<p>Maine (2010). "Department Of Marine Resources: Coastal Fishery Research Priorities for Lobster." ASMFC (2013c). "Special Report No. 89, Research Priorities and Recommendations to Support Interjurisdictional Fisheries Management" ASMFC (2013b). "2013 Review of the Atlantic States Marine Fisheries Commission Fishery Management Plan for American Lobster 2012 Fishing Year." ASMFC (2009). "American Lobster Stock Assessment Report for Peer Review"</p> <p>DMR Research Plan 2010-2012 http://www.maine.gov/dmr/rm/2011-12researchplan.pdf</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			70
CONDITION NUMBER (if relevant):			6

Evaluation Table for PI 3.2.5

PI 3.2.5		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives		
		There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The fishery has in place mechanisms to evaluate some parts of the management system.	The fishery has in place mechanisms to evaluate key parts of the management system	The fishery has in place mechanisms to evaluate all parts of the management system.
	Met?	Y	Y	N

PI 3.2.5		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives		
		There is effective and timely review of the fishery-specific management system		
	Justification	<p>The fishery has in place mechanisms to evaluate key parts of the management system.</p> <p>At the ASMFC level, a number of regular ongoing monitoring and evaluation activities are conducted by several of its committees. The Lobster Plan Review Team reviews the IFMP on almost an annual basis. The review covers the overall performance of the IFMP in terms of the recent management measures, the catch levels, the most recent stock assessment, research and monitoring activities and needs, the compliance of states with implementation of the commission’s regulatory requirements and indicates if any states wish to withdraw for the regulation of lobster (De Minimis status). The review concludes with an identification of issues that are called to the attention of the commission and a set of recommended actions to be undertaken to improve overall lobster management.</p> <p>As well, the Commission’s American Lobster Technical Committee reviews specific management measures or issues, usually as requested by the Lobster Management Board.</p> <p>In the state of Maine, the management system for lobster is subject to a more widespread review on a fairly constant basis. The democratically elected lobster zone councils provide a grassroots scrutiny to the system on an ongoing basis. The Lobster Advisory Council also provides a measure of oversight as to how well the management system and various measures are performing. Similar ongoing review functions take place through the DMR Advisory Committee which meets several times each year. The Standing Committee on Marine Resources of the legislature provides a fairly constant review and oversight of the activities of the department.</p>		
b	Guidepost	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	Y	Y	N
	Justification	<p>The fishery-specific management system is subject to regular internal and occasional external review.</p> <p>There have been several recent specific external reviews or analyses of some Maine’s fishery management activities or policies. These include the Maine Lobster Industry Strategic Plan in 2009, the extensive Program Review of the Department of Marine Resources by outside consultants in 2011 and the 2012 “Independent Evaluation of the Maine Limited Entry Licensing System for Lobster and Crab” conducted by the Gulf of Maine Research Institute. The Strategic Plan was prepared for the Governor’s Task Force on the Economic Sustainability of Maine’s Lobster Fishery. The Program Review recommended extensive adjustments to the organization, focus and priorities of DMR to provide more effective fisheries management. The evaluation of limited entry licensing addresses concerns with a significant fisheries management tool for the lobster fishery.</p> <p>Finally, Journal articles abound that analyze and evaluate many aspects of the lobster management system in Maine. An excellent bibliography of such articles can be found on the Lobster Institute’s website.</p> <p>Overall, it is judged there is regular internal review and occasional external review of parts of the management system for Maine Lobster. The peer review of the stock assessment, while external, is not a regular external of all parts of the management system.</p>		

PI 3.2.5	<p>There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives</p> <p>There is effective and timely review of the fishery-specific management system</p>	
References	<p>ASMFC (2013b). "2013 Review of the Atlantic States Marine Fisheries Commission Fishery Management Plan for American Lobster 2012 Fishing Year", ASMFC (2014). "American Lobster Addendum XVII Evaluation" Gulf of Maine Research Institute (GMRI 2012). "An Independent Evaluation of the Maine Limited Entry Licensing System for Lobster and Crab" Maine (2011). "Program Review of DMR" Maine (2009). "Maine Lobster Industry – Strategic Plan" and Section 4.5.9</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		NA

Appendix 1.2 Risk Based Framework (RBF) Outputs

RBF has not been used to score any PIs.

Appendix 1.3 Conditions and Client Action Plan

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/A)
1	The client must provide evidence that well-defined HCRs, taking into account main uncertainties, are in place and ensure that the exploitation rate is reduced as limit reference points are approached.	1.2.2	NA
2	The client must provide evidence that sufficient data continue to be collected to detect any increase in risk to main bycatch species.	2.2.3	NA
3	The client must provide evidence that a partial strategy is in place to ensure the fishery does not pose a risk of serious or irreversible harm to habitats, that there is some objective basis for confidence that the partial strategy will work, and that there is some evidence that the partial strategy is being implemented successfully.	2.4.2	NA
4	The client must provide documented evidence that clear long-term objectives for the GOM lobster fishery, which guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach and are explicit within management policy have been adopted.	3.1.3	NA
5	The client must provide documented evidence that the GOM lobster fishery has adopted short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 and are explicit within the fishery's management system have been adopted.	3.2.1	NA
6	The client must provide documented evidence that the GOM lobster fishery has a research plan that provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	3.2.4	NA

Table A1.3: Condition 1

Performance Indicator	1.2.2 Harvest Control rules
Score	65
Rationale	<p>Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached. Specifically, Addendum XVI requires management action to rebuild the GOM lobster stock if it is depleted (overfished) as well as action to reduce exploitation if overfishing is occurring.</p> <p>The specifics of management measures vary between LCMAs. Effort is controlled by way of limited access licenses and trap limits, with maximum trap sizes and requirements for gear identification, escape vents and ghost panels. The main conservation measures include restrictions on harvest of lobsters smaller than minimum and larger than maximum carapace lengths, protection of berried (ovigerous) females and mandatory/voluntary practice of v-notching berried females.</p>

	Abundance and exploitation reference points are in place to guide management decision making, however, predetermined management actions that would constitute well-defined harvest control rules have not been adopted for the GOM lobster fishery.
Condition	The client must provide evidence that well-defined HCRs, taking into account main uncertainties, are in place and ensure that the exploitation rate is reduced as limit reference points are approached.
Milestones	<p><u>By year 1:</u> The client shall provide documentary evidence, (e.g., correspondence, minutes of meetings, etc.) of the client group actively working to promote the adoption of appropriate harvest control rules for the fishery. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By year 2:</u> The client shall provide further evidence of the client group actively working to promote the adoption of appropriate harvest control rules and provide a report on the progress being made toward the adoption of appropriate harvest control rules for the fishery. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By year 3:</u> The client shall provide evidence of consideration by the management bodies to adopt an appropriate harvest control rule for the fishery. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By year 4:</u> The client shall provide evidence that well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached, and the selection of the harvest control rule takes into account the main uncertainties. Meeting this milestone will demonstrate that all scoring issues of the SG 80 have been met and would result in a score of 80 for this performance indicator.</p>
Client action plan	<p><u>Action Plan</u> Examples of actions may include:</p> <ul style="list-style-type: none"> - Client engaging with management agencies to discuss option to fulfil this condition; and - Client actively working to achieve the milestones as described more fully below. <p><u>Responsible parties</u> Client Group Members</p> <p><u>Timeframe for Milestones</u> <u>By the first annual audit:</u> The client group shall provide documentary evidence, (e.g., correspondence, minutes of meetings, etc.) of the client group actively working to promote the adoption of appropriate harvest control rules for the fishery. The client group will accomplish this by: Providing evidence of working to promote the adoption of appropriate harvest control rules for the fishery.</p> <p><u>By the second annual audit:</u> The client shall provide further evidence of the client group actively working to promote the adoption of appropriate harvest control rules and provide a report on the progress being made toward the adoption of appropriate harvest control rules for the fishery. The client group will accomplish this by: Providing evidence of the progress that has been made to promote the adoption of appropriate harvest control rules and provide a report on the progress being made toward the adoption of appropriate harvest control rules for the fishery.</p> <p><u>By the third annual audit:</u> The client shall provide evidence of consideration by the management bodies to adopt an appropriate harvest control rules for the fishery.</p>

	<p>The client group will accomplish this by: Providing evidence of consideration by the management bodies to adopt an appropriate harvest control rule for the fishery.</p> <p><u>By the fourth annual audit:</u> The client shall provide evidence that well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached, and the selection of the harvest control rule takes into account the main uncertainties.</p> <p>The client group will accomplish this by: Providing the fishery management plan that includes well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached, and the selection of the harvest control rule takes into account the main uncertainties.</p>
Consultation on condition	<p>A letter of support has been requested to DMR but is not available for the PCDR. To avoid further delay in the assessment process, SAI Global decided to post the PCDR without that letter which will be included in the Final Report. The letter of support is available and included in the section below.</p>

Table B1.3: Condition 2

Performance Indicator	2.2.3 Bycatch Species information
Score	75
Rationale	<p>Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.</p> <p>According to DMR scientists met during the site visit, Federal observer data and data from the DMR Lobster Sea Sampling Program, at least 10 finfish species are recorded as bycatch, among which sculpins, sea raven, cunner, Atlantic cod, redfish, cusk, spiny dogfish, hake, flatfishes, mackerel, pollock, and lumpfish. Cod, cusk, yellowtail flounder and witch flounder are considered as main bycatch species.</p> <p>Although data on bycatch continue to be collected through the the Federal observer program, the VTR and the DMR Lobster Sea Sampling Program, the data are not regularly compiled and published. Furthermore, the assesement team considered that the data collected are not sufficient to detect any increase in risk to main bycatch species.</p> <p>Both Federal and State observer coverage is very low, less than 1%, although sampling is well distributed among seasons and fishing areas. NMFS scientist mentioned during the site visit that it's difficult to estimate net amounts of bycatches due to the lack of information on fishing effort. Expansion estimates from the Lobster Sea Sampling Program are not available at this time. A study of bycatch in Maine lobster fishery concluded that further research needs to be conducted in order to better understand the magnitude of finfish bycatch in lobster commercial fishery.</p>
Condition	<p>The client must provide evidence that sufficient data continue to be collected to detect any increase in risk to main bycatch species.</p>
Milestones	<p><u>By Year 1:</u> The Assessment team shall be provided with documentary evidence (e.g., correspondence, minutes of meetings, etc.) of the client group actively working to promote the adoption of a method to provide sufficient bycatch data to detect any increase in risk to main bycatch species. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By year 2:</u> The client shall provide further evidence of the client group actively working to promote the adoption of a method to provide sufficient bycatch data to detect any increase in risk to main bycatch species and provide a report on the progress being made toward the adoption of this method for the</p>

	<p>fishery. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By Year 3:</u> The client shall provide evidence of consideration by the management bodies to adopt a method to provide sufficient bycatch data to detect any increase in risk to main bycatch species. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By Year 4:</u> The client shall provide evidence that sufficient data continue to be collected to detect any increase in risk to main bycatch species. Meeting this milestone will demonstrate that all scoring issues of the SG 80 have been met and would result in a score of 80 for this performance indicator.</p>
<p>Client action plan</p>	<p><u>Action Plan</u> Examples of actions may include:</p> <ul style="list-style-type: none"> - Client engaging with management agencies to discuss option to fulfil this condition; and - Client actively working to achieve the milestones as described more fully below. <p><u>Responsible parties</u> Client Group Members</p> <p><u>Timeframe for Milestones</u> <u>By the first annual audit:</u> The Assessment team shall be provided with documentary evidence (e.g., correspondence, minutes of meetings, etc.) of the client group actively working to promote the adoption of a method to provide sufficient bycatch data to detect significant increase in risk to the main bycatch species. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By the second annual audit:</u> The client shall provide further evidence of the client group actively working to promote the adoption of a method to provide sufficient bycatch data to detect significant increase in risk to the main bycatch species and provide a report on the progress being made toward the adoption of this method for the fishery. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By the third annual audit:</u> The client shall provide evidence of consideration by management bodies to adopt a method to provide sufficient bycatch data that would detect any increase in risk to the main bycatch species. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By the fourth annual audit:</u> The client shall provide evidence that sufficient data is being collected to detect any increase in risk to main bycatch species. Meeting this milestone will demonstrate that all scoring issues of the SG 80 have been met and would result in a score of 80 for this performance indicator.</p>
<p>Consultation on condition</p>	<p>A letter of support has been requested to DMR but is not available for the PCDR. To avoid further delay in the assessment process, SAI Global decided to post the PCDR without that letter which will be included in the Final Report. The letter of support is available and included in the section below.</p>

Table C1.3: Condition 3

Performance Indicator	2.4.2. Habitats Strategy
Score	60
Rationale	<p>The Habitat Program of the ASMFC is a branch of the Interstate Fisheries Management Program (ISFMP), which serves to support and supplement the efforts of the ISFMP Policy Board, fisheries Management Boards and Technical Committees. The goal of the Habitat Program is to identify, enhance, and cooperatively manage vital fish habitat for conservation, restoration, and protection, and supporting the cooperative management of ASMFC and jointly-managed species.</p> <p>NOAA is required to describe and identify essential fish habitat (EFH) in their respective regions, to specify actions to conserve and enhance that EFH, and to minimize the adverse effects of fishing on EFH. Congress defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity."</p> <p>The National Fish Habitat Action Plan is a nationwide, partnership-based investment strategy to increase the return on fish habitat conservation efforts. The Action Plan encourages collaboration between public agencies, private organizations, and citizens to provide ecosystem-wide results. With a network of regional partnerships setting priorities based on scientific assessment and strategic planning, the Action Plan provides a framework for collaborative action to conserve habitats vital to coastal and marine fisheries.</p> <p>Impacts on habitats are limited by restricting the number and size of traps in use, and the number of fishermen. In addition, programs have been carried out to recover lost lobster traps. For example, during the 2010 gear recovery effort, more than 1,000 traps were recovered by 27 fishing vessels from three lobster conservation management zones.</p> <p>However it cannot be said that a partial strategy is in place as there has apparently been no explicit consideration of potential habitat impacts of the fishery, and how fishing operations should be changed if the measures in place proved to be unsuitable for meeting SG80 for 2.4.1.</p>
Condition	The client must provide evidence that a partial strategy is in place to ensure the fishery does not pose a risk of serious or irreversible harm to habitats, that there is some objective basis for confidence that the partial strategy will work, and that there is some evidence that the partial strategy is being implemented successfully.
Milestones	<p><u>By year 1:</u> The client will provide documented evidence to show the likely significance of the potential cumulative impacts on habitats and, if necessary, implement a partial strategy.</p> <p><u>By year 2:</u> The client will provide evidence that the partial strategy, if warranted, is being implemented successfully.</p> <p>The above provides incremental steps in achieving the condition. It is possible that the condition could be rescored and closed out by the first annual audit, if the outcome of evaluating the cumulative effects of hauling and setting lobster traps on sea bed habitats shows insignificant impacts on habitats. If the outcome of evaluation shows a need for a partial strategy this will be reviewed at the second annual audit with the expectation that a minimum score of 80 will be achieved.</p>
Client action plan	<p><u>Action Plan</u></p> <p>Examples of actions may include:</p>

	<ul style="list-style-type: none"> - Client engaging with management agencies to discuss option to fulfil this condition; and - Client actively working to achieve the milestones as described more fully below. <p><u>Responsible parties</u> Client Group Members</p> <p><u>Timeframe for Milestones</u> <u>By the first annual audit:</u> The client will provide documented evidence to show the likely significance of the potential cumulative impacts on habitats and, if necessary, implement a partial strategy.</p> <p><u>By the second annual audit:</u> The client will provide evidence that the partial strategy, if warranted, is being implemented successfully.</p>
Consultation on condition	A letter of support has been requested to DMR but is not available for the PCDR. To avoid further delay in the assessment process, SAI Global decided to post the PCDR without that letter which will be included in the Final Report. The letter of support is available and included in the section below.

Table D1.3: Condition 4

Performance Indicator	3.1.3. Long-term Objectives
Score	70
Rationale	<p>The Program Goals of the ISFMP, spelled out in the Commission’s Charter, represent the overall fisheries management objectives of the ASMFC activities. These require the commission’s conservation programs and management measures to maintain stocks in an abundant and self-sustaining condition, to protect fish habitat, minimize waste and promote fairness and equity in access and allocation. However, there is no mention of precautionary approaches to management such as usually found in the use of reference points and pre-set harvest control rules. While many of the agreed lobster management measures are of a precautionary nature in that they protect the spawning component of the stock and control fishing effort, this is not the full precautionary approach as envisaged by the MSC Principles and Criteria.</p> <p>The management objectives that contained in the MSA are more consistent with MSC Principles. In addition, NMFS is required to comply with the requirements of the National Environmental Policy Act (NEPA) when completing or approving fisheries management plans. However, it does not have approval authority over lobster management plans or the development of lobster management policy and measures as these are now the sole purview of ASMFC.</p> <p>Finally, the stated purpose of Maine’s DMR does not contain specific long-term objectives that are consistent with MSC Principles and Criteria and the precautionary approach and guide lobster management policy.</p>
Condition	The client must provide documented evidence that clear long-term objectives for the GOM lobster fishery, which guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach and are explicit within management policy have been adopted.
Milestones	<u>By year 1:</u> The client will provide evidence that explicit long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach have been incorporated within management policy. Meeting this milestone

	will demonstrate that all scoring issues of the SG 80 have been met and would result in a score of 80 for this performance indicator.
Client action plan	<p><u>Action Plan</u> Examples of actions may include:</p> <ul style="list-style-type: none"> - Client engaging with management agencies to discuss option to fulfil this condition; and - Client actively working to achieve the milestones as described more fully below. <p><u>Responsible parties</u> Client Group Members</p> <p><u>Timeframe for Milestones</u> <u>By the first annual audit:</u> The client will provide evidence that explicit long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach have been incorporated within management policy. Meeting this milestone will demonstrate that all scoring issues of the SG 80 have been met and would result in a score of 80 for this performance indicator.</p>
Consultation on condition	A letter of support has been requested to DMR but is not available for the PCDR. To avoid further delay in the assessment process, SAI Global decided to post the PCDR without that letter which will be included in the Final Report. The letter of support is available and included in the section below.

Table E1.3: Condition 5

Performance Indicator	3.2.1. Fishery-Specific Objectives
Score	70
Rationale	<p>Amendment 3 to the Interstate Fishery Management Plan for Lobster indicates “The plan, when fully implemented, is designed to minimize the chance of a population collapse due to recruitment failure. The goal of Amendment 3 is to have a healthy American lobster resource and a management regime which provides for sustained harvest, maintains appropriate opportunities for participation, and provides for cooperative development of conservation measures by all stakeholders. To achieve this goal, the plan adopts the following objectives:</p> <ol style="list-style-type: none"> 1) Protect, increase or maintain, as appropriate, the brood stock abundance at levels which would minimize risk of stock depletion and recruitment failure. 2) Develop flexible regional programs to control fishing effort and regulate fishing mortality rates; 3) Implement uniform collection, analysis, and dissemination of biological and economic information; improve understanding of the economics of harvest; 4) Maintain existing social and cultural features of the industry wherever possible; 5) Promote economic efficiency in harvesting and use of the resource; 6) Minimize lobster injury and discard mortality associated with fishing; 7) Increase understanding of biology of American lobster, improve data, improve stock assessment models; improve cooperation between fishermen and scientists; 8) Evaluate contributions of current management measures in achieving objectives of the lobster FMP; 9) Ensure that changes in geographic exploitation patterns do not undermine success of ASMFC management program; 10) Optimize yield from the fishery while maintaining harvest at a sustainable level; 11) Maintain stewardship relationship between fishermen and the resource

	<p>There are no lobster fishery specific objectives defined for the State of Maine's management of its lobster fishery. A management plan is in development at the state level that will likely rectify this shortfall.</p> <p>While the ASMFC's objectives for lobster fishery management might be acceptable as meeting some of the MSC requirements under SG 80, they do not directly address the precautionary approach nor ecosystem considerations and they are not explicit in the lobster fishery management system of the state of Maine at this time.</p>
Condition	<p>The client must provide documented evidence that the GOM lobster fishery has adopted short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 and are explicit within the fishery's management system have been adopted.</p>
Milestones	<p><u>By year 1:</u> The client is required to provide evidence of progress toward a commitment by the management agencies to incorporate short and long term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, within the fishery's management system. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By year 2:</u> The client will provide evidence that short and long term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system. Meeting this milestone will demonstrate that all scoring issues of the SG 80 have been met and would result in a score of 80 for this performance indicator.</p>
Client action plan	<p><u>Action Plan</u> Examples of actions may include:</p> <ul style="list-style-type: none"> - Client engaging with management agencies to discuss option to fulfil this condition; and - Client actively working to achieve the milestones as described more fully below. <p><u>Responsible parties</u> Client Group Members</p> <p><u>Timeframe for Milestones</u> <u>By the first annual audit:</u> The client is required to provide evidence of progress toward a commitment by the management agencies to incorporate short and long term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, within the fishery's management system. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By the second annual audit:</u> The client will provide evidence that short and long term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system. Meeting this milestone will demonstrate that all scoring issues of the SG 80 have been met and would result in a score of 80 for this performance indicator.</p>
Consultation on condition	<p>A letter of support has been requested to DMR but is not available for the PCDR. To avoid further delay in the assessment process, SAI Global decided to post the PCDR without that letter which will be included in the Final Report. The letter of support is available and included in the section below.</p>

Table F1.3: Condition 6

Performance Indicator	3.2.4. Research Plan
Score	70
Rationale	<p>At the ASMFC level, the ongoing reviews of the lobster fishing plan details a number of research priorities recommendations aimed at improving the overall fishery management effort. The 2013 Review of the 2012 fishery management plans contains eight recommendations on Research Needs and Program Research indicating priority areas for future research, analysis and investigation. As well, the 2009 stock assessment report contained 15 recommendations to improve the scope and quality of advice that is provided for management of this stock and fishery. These included a recommendation that "... a socio-economic study be implemented to determine the economic viability of effort reductions"</p> <p>As well, Special Report No. 89 of the Atlantic States Marine Fisheries Commission detailed species specific research needs and priorities in 2013. There is a section on lobster that outlines high, moderate or low priorities under the following categories: Fishery-Dependent Priorities, Fishery -Independent Priorities, Modeling/Quantitative Priorities, Life History, Biological, and Habitat Priorities and Management, Law Enforcement, and Socioeconomic Priorities.</p> <p>All these recommendations are meant to provide guidance to appropriate scientists from state organizations as well as those from NMFS in determining the focus of their research efforts. This is supplemented in the case of Maine by the research priority setting that is conducted there periodically. The most recent was the 2010 priority setting done in collaboration with the Gulf of Maine Research Institute (GMRI) and the University of Maine Sea Grant Program.</p> <p>The DMR has a 2010-2012 Research Plan which is intended to be a description of research, monitoring, restoration and outreach activities to be undertaken by the DMR with existing resources, not a comprehensive research plan that outlines all needed research. However, the plan does not include research on the impact of the lobster fishery on habitats and bycatch species and there is a lack of evidence that this plan has been extended after 2012 and is still in use, preventing the fishery from meeting SG 80 and 100.</p>
Condition	The client must provide documented evidence that the GOM lobster fishery has a research plan that provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
Milestones	<p><u>By year 1:</u> The client shall provide documentary evidence, (e.g., correspondence, minutes of meetings, etc.) of the client group actively working to promote the development and adoption of a research plan that provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2. Meeting this milestone would likely not result in a change in score at this surveillance audit. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By year 2:</u> The client shall provide evidence of a research plan for the fishery that provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2. Meeting this milestone will demonstrate that all scoring issues of the SG 80 have been met and would result in a score of 80 for this performance indicator.</p>
Client action plan	<u>Action Plan</u>

	<p>Examples of actions may include:</p> <ul style="list-style-type: none"> - Client engaging with management agencies to discuss option to fulfil this condition; and - Client actively working to achieve the milestones as described more fully below. <p><u>Responsible parties</u> Client Group Members</p> <p><u>Timeframe for Milestones</u></p> <p><u>By the first annual audit:</u> The client shall provide documentary evidence, (e.g., correspondence, minutes of meetings, etc.) of the client group actively working to promote the development and adoption of a research plan that provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC’s Principles 1 and 2. Meeting this milestone would likely not result in a change in score at this surveillance audit. Meeting this milestone would likely not result in a change in score at this surveillance audit.</p> <p><u>By the second annual audit:</u> The client shall provide evidence of a research plan for the fishery that provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC’s Principles 1 and 2. Meeting this milestone will demonstrate that all scoring issues of the SG 80 have been met and would result in a score of 80 for this performance indicator.</p>
<p>Consultation on condition</p>	<p>A letter of support has been requested to DMR but is not available for the PCDR. To avoid further delay in the assessment process, SAI Global decided to post the PCDR without that letter which will be included in the Final Report. The letter of support is available and included in the section below.</p>

Letter of support from the Maine Department of Marine Resources



PAUL R. LEPAGE
GOVERNOR

STATE OF MAINE
DEPARTMENT OF MARINE RESOURCES
21 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0021

PATRICK C. KELIHER
COMMISSIONER

September 1, 2016

Géraldine Criquet, Ph. D.
Team Leader for MSC Fisheries Programme
SAI Global
Quayside Business Park, Mill Street
Dundalk, County Louth, Ireland
geraldine.criquet@saiglobal.com

Sent via email only

Re: Maine Certified Sustainable Lobster Association, Inc.

Dear Dr. Criquet:

I have reviewed the Draft Client Action Plan submitted by the Maine Certified Sustainable Lobster Association, Inc. (the "Client Group") and believe the actions described within it for the Client Group are realistic in scope and represent a worthwhile effort to improve our understanding and management of Maine's lobster fishery. As always, the Department's decisions regarding how and when to take any management action will be driven by our determination regarding what is in the best, long-term interest of Maine's lobster industry.

Over the past two years, members of my staff have been in communication with members of the Client Group and have worked with them as they have sought information required by SAI Global in the process to secure MSC certification. I welcome the continued participation of the Client Group and its representatives in the state and interstate forums where issues regarding lobster management are discussed and advanced.

Maine's lobster fishery practices sustainable fishing methods and by any measure is a thriving resource. I sincerely hope that granting MSC certification to this Client Group will help to further illustrate this to consumers and that their renewed appreciation of the many positive aspects of this fishery will result in increased economic benefits for everyone involved in Maine's lobster industry.

Sincerely,


Patrick C. Keliher
Commissioner

OFFICES AT 32 BLOSSOM LANE, AUGUSTA, MAINE
<http://www.Maine.gov/dmr>

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Appendix 2. Peer Review Reports

Peer Review 1's comments

Overall Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes	Conformity Assessment Body Response
<p><u>Justification:</u> I believe that the assessment team has reached the correct conclusion that this fishery should be certified. There is overlap with another certified fishery – Maine Lobster trap Fishery – and the assessment team has ensured that the two fishery assessments have been appropriately harmonised. The assessment report provides a comprehensive summary of the key elements of the fishery, and although I have raised a number of queries about the score for specific Performance Indicators, in general I believe that the fishery has been scored correctly.</p> <p>The assessment of the fishery against Principle 1 Performance Indicators centres around the scenario of a fishery which has shown a consistent increase in landings from around 1990 to the present day, an observed time trend which is considered to be a persistent environmentally-driven increase in recruitment. This historical time series of increasing recruitment, abundance and landings makes it difficult to estimate MSY or use conventional per recruit based proxies for Bmsy and Fmsy as any assumption of equilibrium conditions would be misleading. In consequence, trend-based reference points - reference abundance and effective exploitation – are used in this fishery, and this seems to be an appropriate and pragmatic method for assessing stock status of Maine lobster. The authors correctly identify some of the uncertainties underlying such an approach. A key gap in the harvest strategy is the lack of well-defined harvest control rules for which a condition is raised, but the assessment team also highlight that there is no reliable estimate of total fishing effort in this fishery.</p> <p>For Principle 2 comprehensive information is provided in the report on the potential impact of the fishery on retained, bycatch and ETP species, and these potential interactions are rigorously assessed. There is less information on the interaction of the fishery with habitats, and it is appropriate that a condition is raised requiring a (partial) strategy to be implemented to ensure that the fishery does not pose a risk of serious or irreversible harm to habitats.</p> <p>For Principle 3 the assessment report includes a comprehensive review of the management and governance of the Maine lobster fishery which, along with strong enforcement and compliance, are key strengths of the fishery. The main deficiencies relate to the lack of objectives that are consistent with outcomes expressed by Principle 2.</p>		<p>The assessment team acknowledges the reviewers for his comments, and responses to comments on specific PI and rationale are provided in the Performance Indicator Review table.</p>

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?	Yes, but see comments on timescales	Conformity Assessment Body Response
<p><u>Justification:</u></p> <p><u>Condition 1. Harvest Control Rules.</u> I believe that this condition is appropriately written to achieve the SG80 outcome. In view of the likely difficulty of agreeing and implementing specific management measures, a timescale of 4 years to meet this condition is appropriate.</p> <p><u>Condition 2. Information on bycatch.</u> The condition is appropriately written to achieve the SG80 outcome. The timescale of 4 years to meet this condition is generous and could be reduced.</p> <p><u>Condition 3. Habitats strategy.</u> The condition is appropriately written to achieve the SG80 outcome. However I believe that the timescale to implement the partial strategy will be difficult to achieve.</p> <p><u>Condition 4. Long term objectives.</u> The condition is appropriately written to achieve the SG80 outcome. Bearing in mind that the client will need to liaise with management agencies, the timescale of only one year to meet this condition seems excessively restrictive.</p> <p><u>Condition 5. Fishery specific objectives.</u> The condition is appropriately written to achieve the SG80 outcome. Meeting this condition within two years may be challenging as cooperation from management agencies will be required.</p> <p><u>Condition 6. Research plan.</u> The condition is appropriately written to achieve the SG80 outcome. Meeting this condition within two years may be challenging as cooperation from management agencies will be required.</p>		<p>The assessment team acknowledges the reviewers for his comments.</p> <p><u>Condition 1</u> No response is required.</p> <p><u>Condition 2</u> The assessment team considers that a timescale of 4 years to meet this condition is appropriate, and reduced timescale could be challenging for the client to meet this condition. Although the DMR plans to work with ASMFC Lobster Technical Committee and the Northeast Fishery Management Council Groundfish Planning Development Team to responsibly develop the methods of expansion for adequate information on bycatch, no timeline has been specified by DMR. The client will need to liaise with DMR and actively work to promote the development and the adoption of methods of expansion to obtain adequate information on bycatch.</p> <p><u>Condition 3, 4, and 5</u> The fishery under assessment fully overlaps with the certified Maine lobster fishery. As per C13.2.2 CABs shall ensure that conclusions are consistent between the two fisheries, with respect to evaluation, scoring and conditions, C13.2.3.4 The team responsible for the new assessment shall consider the findings of the surveillance report (s) produced for the overlapping certified fishery, if any. The same conditions have been raised and milestones have been harmonized for the two fisheries. The report for the second surveillance audit for the Maine fishery was published in February 2016 and the third surveillance audit site visit is scheduled for end of September. The year 1 milestone for the fishery under assessment should match with the Year 3 or Year 4 milestone of the Maine lobster fishery. For more clarity the conditions milestones for the Maine lobster fishery have been added in section 5.1.</p> <p><u>Condition 6</u> The assessment team considers that a timescale of 2 years to meet this condition is appropriate.</p>

	The DMR has a 2010-2012 Research Plan. The condition has been raised due to the lack of evidence that the plan has been updated with current and plan research projects on habitat impacts and bycatch monitoring and extended after 2012. The assessment team considers that 2 year should be enough for updating the existing research plan.
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If included:

<i>Do you think the client action plan is sufficient to close the conditions raised?</i>	Yes but see comments on evidence of support from management agencies	Conformity Assessment Body Response
<p><u>Justification:</u></p> <p><u>Condition 1. Harvest Control Rules.</u> The client plan is sufficient to close this condition. However I would like to see some evidence of support from the management authorities to investigate and implement appropriate management actions if limit reference points are approached or exceeded.</p> <p><u>Condition 2. Information on bycatch.</u> The client plan is sufficient to close this condition. Again, evidence of support from the management authorities should be provided.</p> <p><u>Condition 3. Habitats strategy.</u> The client plan is sufficient to close this condition.</p> <p><u>Condition 4. Long term objectives.</u> The client plan is sufficient to close this condition, but there needs to be evidence of support from the management agencies if the condition is to be met within one year.</p> <p><u>Condition 5. Fishery specific objectives.</u> The client plan is sufficient to close this condition, but there needs to be evidence of support from the management agencies if the condition is to be met within two years.</p> <p><u>Condition 6. Research plan.</u> The client plan is sufficient to close this condition, but there needs to be evidence of support from the management agencies if the condition is to be met within two years.</p>		<p>A letter of support has been requested to DMR but is not available for now. To avoid further delay in the assessment process, SAI Global decided to post the PCDR without that letter which will be included in the Final Report. A statement has been added in the condition tables.</p>

For reports using the Risk-Based Framework please follow [the link](#).

For reports assessing enhanced fisheries please follow [the link](#).

General Comments on the Assessment Report (optional)

The assessment report is well-written and comprehensive, and issues surrounding harmonisation with the other Maine lobster fishery (and connectivity with other adjacent lobster fisheries) are discussed in detail.

There are a number of minor errors or typos which are listed below:

The background information is well-researched, but many of the studies referenced in the text are not given in the reference list. This is particularly noticeable in the general biology section.

[Assessment team’s response: a search has been and missing references have been added to the References section.](#)

Glossary – there are a few technical bodies e.g. Lobster Stock Assessment Sub-Committee (SASC) for which acronyms are given in the text, but which are missing from the glossary.

Assessment team's response: missing acronyms have been added to the glossary.

Page 9, section 2.3 should be "...six conditions were attached to the fishery..."

Assessment team's response: it has been amended.

There is some duplication of text on page 16, genetics studies of lobsters, and in sections 4.2.5 and 4.2.6.

Assessment team's response: there is no text on genetics study of lobster included in sections 4.2.5 and 4.2.6 which refers to Fishing season and Fishing method and fleet, respectively.

Table 1 figures (page 28) do not seem to match up with the corresponding text on page 27.

Assessment team's response: the table 1 was the wrong one and has been replaced by the right table extracted from ASFMC 2015.

Figure 4 on page 29 looks to be an important output from the assessment and so a more detailed figure caption is required.

Assessment team's response: the caption for Figure 4 on page 29 comes directly from the source document and quite adequately describes what is presented.

Some of the text on stock indicators needs tightening up. For example, on page 28 under the heading Mortality, the text reads "Exploitation rate is used as an indicator of mortality. Annual exploitation rates from 2008-2013 are mostly positive." I assume that this means that exploitation rates are increasing. Elsewhere indicators are described as "increasing" or "decreasing", which I think is a better description than "positive" or "negative".

Assessment team's response: the text on page 29 describes the various stock indicators which are simply classified as positive (i.e. a good thing) or negative (i.e. a bad thing). The use in Fishery Performance of high, lower, and increased to qualify number of traps and set over days is meant to clarify how these are being treated like a mortality index. This text was taken from the source document and I think it should be left as is.

Performance Indicator Review

Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
<i>Example: 1.1.2</i>	No	No	NA	<i>The certifier gave a score of 80 for this PI. The 80 scoring guidepost asks for a target reference point that is consistent with maintaining the stock at Bmsy or above, however the target reference point given for this fishery is Bpa, with no indication of how this is consistent with a Bmsy level.</i>	
1.1.1	No	Yes	N/A	For Sla, estimates of recruitment are available from the assessment model and this information would provide additional justification that the SG100 is met for Sla. The table of reference points and current stock status relative to those reference points has not been included in the scoring table.	The statement "Recent recruitment levels are at or near record levels" has been added to the Sla rationale. The third paragraph of the rationale provides reference points and current status relative to those reference points.

1.1.2	Yes	No	N/A	<p>Conventional reference points based on MSY or proxies for Bmsy and Fmsy based upon per-recruit mortality based reference points are not considered appropriate for this stock as the sustained increase in productivity over many years suggests that any assumption of equilibrium conditions is misleading, and that the current high abundance of lobsters is driven by the current ecological regime which favours high recruitment. The trend-based reference points used in this fishery - reference abundance and effective exploitation - are considered interim reference points until biologically-based reference points can be developed. This is a pragmatic approach based upon the current scenario of sustained increased productivity, and therefore I agree that this PI meets the SG80, and that because of the uncertainty around the applicability of the reference period, the SG100 is not met. There would be increased justification for the fishery meeting SG80 with the provision of further detail on the choice of the reference period and in relation to the statements that the 25th and 75th percentiles can be considered more or less equivalent to 40% Bmsy and 80% Bmsy respectively in a more conventional PA framework.</p> <p>For SId, a brief rationale should be given to justify the conclusion that American lobster is not a key LTL species.</p> <p>(Minor point – the scoring rationale for SIa states that “...the fishery does not meet 80a”. This is clearly an error.)</p>	<p>The 1982-2003 reference period was chosen by the SASC without explanation in its 2005 stock assessment (ASMFC 2006) and used in subsequent assessments. As pointed out in the 1.1.2 SIb rationale, this reference period includes a significant portion of the period of dramatically increasing abundance that started in 1988, which ensures conservative reference points. While technically not equivalent to 40% and 80% B_{msy}, statements in SIb and SIc regarding the 25th and 75th percentiles were simply intended to indicate they were being used as lower and upper reference points in a comparable way. Wording will be altered to more clearly reflect what was intended.</p> <p>A rationale will be included for SId.</p> <p>SIa has been amended to reflect the fact that the fishery does meet SG 80.</p>
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Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.3	N/A	N/A	N/A		No response is required.
1.2.1	Yes	Yes	N/A		No response is required.
1.2.2	Yes	Yes	Yes (but see general comment about support from relevant authorities on meeting the condition)	I agree that there are generally understood HCRs in place as described by Tables 1 and 3 in section 4.3.4. However pre-determined management actions are not explicitly specified, and therefore it cannot be concluded that there are "well-defined" HCRs in place. In addition the selection of the harvest control rules does not take the main uncertainties into account. A score fo 65 for this PI is justified therefore. To validate the effectiveness of any HCRs, reliable estimates of total fishing effort will be required, and as noted in the rationale for PI 1.2.3, such estimates are not currently available.	A letter of support has been requested to DMR but is not available for now. To avoid further delay in the assessment process, SAI Global decided to post the PCDR without that letter which will be included in the Final Report. A statement has been added in the condition tables. A recommendation regarding the development of reliable estimate of total fishing effort has been added.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.3	No	Yes	N/A	<p>There is a large amount of information available for the Maine lobster fishery from both fishery-dependent and fishery-independent sources and from historical and current research programmes. A score of 80 is justified for this PI, but I agree with the assessment team that the lack of a reliable estimate of total fishing effort is a significant gap in knowledge which needs to be filled, particularly if methods for reductions in fishing effort are required if the current ecological regime favouring high recruitment does not continue or if HCRs need to be invoked. At the very least, the assessment team should make a recommendation that a reliable estimate of total fishing effort should be developed.</p> <p>Under Sic, there should be a comment about what is known about the level of landings from recreational fishers.</p>	<p>A recommendation regarding the development of reliable estimate of total fishing effort has been added.</p> <p>Information on lobster landings from recreational fishery has been added in the rationale for Sic and in the section 4.2.4 of the background.</p>
1.2.4	Yes	Yes	N/A		No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.1	Yes	Yes	N/A	<p>Whilst I agree with the rationales given for the scores, I would suggest two modifications.</p> <p>Firstly, the single main retained species (herring) is not outside biologically-based limits, so I understand that the SG60 and SG80 for S1c should be 'N/A' rather than 'Y'.</p> <p>Secondly, I think that it would help the reader if an explanation could be given as to how the scoring of the various elements resulted in an overall score of 85 for this PI.</p>	<p>The following amendments have been done.</p> <p>S1c is now NA rather than yes. The rationale explaining why herring is within limits has been left.</p> <p>The reference to MSC CR 27.10.7.4 has been added as well as the score for all the different scoring elements.</p>
2.1.2	Yes	Yes	N/A	See comment for PI 2.1.1 about calculation of overall PI score based on scoring the different elements.	See response above.
2.1.3	Yes	Yes	N/A	As above	See response for comments on 2.1.1.
2.2.1	Yes	No	N/A	For scoring issue a, there are 4 minor bycatch species which are scored at SG100 but no evidence is given as to why there is a high degree of certainty that these species are (or are not) within biologically-based limits.	The rationale has been revised to include additional minor species and to provide stock status of minor species.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.2.2	Yes	Yes	N/A		No response is required.
2.2.3	Yes	Yes	Yes		No response is required.
2.3.1	Yes	No	N/A	Whilst I agree with the scores allocated for the different species, and the background information of the report provides a detailed review of the potential effects of the fishery on ETP species, the rationales should be more explicit as to why the SG100 is met for some species, but not for others.	The ratioanle clearly explains why species met ot not SG 100. However, a more explicit conclusion has been added for fin whale and additional information has been provided for sea turtles.
2.3.2	Yes	Yes	N/A		No response is required.
2.3.3	Yes	Yes	N/A		No response is required.
2.4.1	Yes	Yes	N/A		No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.2	Yes	No	Yes	Some rationale should be given as to why SG60b is met. (Minor point – the condition number should be 3.)	A rationale explaining why 60b is met has been added. The condition number has been changed to 3.

2.4.3	No	Yes	N/A	<p>The rationale for scoring issue b emphasises the range of studies that have been undertaken on the potential impact of lobster traps on habitats, but the rationale needs to incorporate specific information for this area/fishery on the overlap/interaction of the fishery with habitat types.</p>	<p>The following has been added to the rationale: New England Fishery Management Council completed a detailed examination of impacts of fishing gear on Gulf of Maine bottom habitats (NEFMC 2011), using a vulnerability matrix (susceptibility x recovery), and based on a detailed literature review and professional judgement. This review concluded that trap gear has low impacts on bottom habitats (both geological and biological components), with “susceptibility” scoring below 1 on a scale of 4 (10% or less of habitat quality affected) and “recovery” times short (scoring below 1.5 on a scale of 4, or less than about 1.5 years).</p>
2.5.1	Yes	Yes	N/A		No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.2	Yes	Yes	N/A		No response is required.
2.5.3	Yes	Yes	N/A		No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.1	Yes	No	N/A	Whilst it is clear that the management system is capable of delivering sustainable fisheries in accordance with MSC Principle 1, it is not clear that the same applies to Principle 2. Additional evidence is required to demonstrate that the management system can deliver outcomes consistent with MSC Principle 2.	The Assessment Team concluded that an effective legal system exists at the national and state level that provides for the sustainable management of GoM lobster in accordance with MSC Principles 1 and 2. Any shortfall in delivering on Principle 2 requirements is a matter of policy priorities and not of the legal basis for the management system. Moreover there is evidence that an effective cooperation is in place. A good example is the ALWTR which members are State and Federal fishery management agencies, eNGOs, fishers associations and academic/scientific groups.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.2	Yes	Yes	N/A		No response is required.
3.1.3	Yes	Yes	Yes	(Minor point – the text describing the SG80 Guidepost for scoring issue a is incorrect. Correct Guidepost needs inserting.) (Minor point – the condition number should be 4, not 3.)	The correct wording of 80a has been inserted. Condition number has been changed to 4.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.4	Yes	No	N/A	The assessment team has allocated a partial score at SG100 for scoring issue a, and the rationale needs a fuller explanation of how the assessment team reached this conclusion. From the rationale provided, it is not clear how the management system provides for incentives that are consistent with achieving the outcomes expressed by <u>both</u> MSC Principles 1 and 2.	The Assessment Team concluded that the overall GoM lobster management system contains positive and no negative incentives for the sustainable fishing of that resource in accordance with MSC Principle 1 and 2. The partial score on SG100 is because there is no apparent regular review of management policies or procedures to ensure that incentives do not contribute to unsustainable fishing practices.
3.2.1	Yes	Yes	Yes	A partial score for SG80 is appropriate here because the Interstate Fishery Management Plan for Lobster does not explicitly include short and long term objectives that are consistent with outcomes expressed by Principle 2. (Minor point – the condition number should be 5.)	Condition number has been changed to 5.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.2	Yes	No	N/A	The scores allocated by the assessment team seem reasonable based on the background information provided in the report. However the rationales for the various scoring issues need tightening up. The fishery is considered to meet the SG80 for scoring issue c, but under scoring issue e, the rationale states that the precautionary approach is not used. For scoring issue b, there needs to be justification for why the SG100 is not met.	The following sentence has been added to SIb: "There is no evidence that indicates decision-making processes respond to all issues identified, preventing the fishery from meeting 100." Wording of the rationale for SIe has been changed to reflect that a fully formalized PA is not in place.
3.2.3	Yes	Yes	N/A		No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.4	Yes	No	Yes	Although there is no single overarching research plan, there appear to be research priorities set by the various management agencies and by scientific institutions, and so the assessment team's conclusion that the SG80a is not met appears to be a harsh decision. The only deficiency appears to be a lack of research priorities relating to objectives consistent with Principle 2, although "habitat priorities and management" are included in Special Report no. 89 of ASMFC. Given the low likelihood of impact of the lobster fishery on the wider ecosystem, research programmes related to P2 would not likely to be high priority. (Minor point – the condition number should be 6.)	The assessment team disagrees. The assessment team recognized the existence of the DMR 2010-2012 Research Plan. However a condition was raised because there was not evidence that the plan was still in use or extended after 2012. Also the plan does not include research on bycatch, but there is a need to clearly understand the impact of lobster fishery on vulnerable bycatch species such as cod and cusk. Condition number has been changed to 6.
3.2.5	Yes	Yes	N/A		No response is required.

Any Other Comments

Comments	Conformity Assessment Body Response
	No response is required.

Peer Review 2's comments

Overall Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes/No Yes	Conformity Assessment Body Response
<u>Justification:</u> The evidence and analyses presented in the Peer Review Report support the conclusions reached by the Assessment Team.		No response is required.
<i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</i>	Yes/No Yes	Conformity Assessment Body Response
<u>Justification:</u> The 6 conditions and associated Action Plan elements listed in the Peer Review Report are appropriately defined to achieve the SG 80 outcome. The conditions including the Action Plan for the fishery were harmonized to match those established for the other Maine lobster fishery assessment.		No response is required.

If included:

<i>Do you think the client action plan is sufficient to close the conditions raised?</i>	Yes/No Yes	Conformity Assessment Body Response
<u>Justification:</u> Implementation of the Client Action Plan as developed should allow for the Conditions to be closed at the SG 80 scoring level.		No response is required.

For reports using the Risk-Based Framework please follow [the link](#).

This framework was not used to score any of the PIs (per Appendix 1.2, page 186).

For reports assessing enhanced fisheries please follow [the link](#).

The fishery assessed is not an enhanced fishery (per Section 4.1.3, page 14).

General Comments on the Assessment Report (optional)

The content of the Peer Review Report is well documented and presented for all aspects of the Maine lobster fishery and the MSC Principles and Criteria. At the outset of the assessment, the assessors recognized that the harmonization requisites identified in the MSC Standard (FCR, Annex CI) would constitute a central focus of their work; accordingly, they were successful in interacting and collaborating with another CAB for the Maine Lobster Trap Fishery (Acoura Marine; Client – Fund for the Advancement of Sustainable Maine Lobster) in regard to the interpretation and scoring of evidence, and the determination of conditions and associated milestones which make up the fishery's Action Plan (details reported at Section 5.1 at pages 94-95). This is reassuring as it ensures consistency of assessment outcomes and safeguards the integrity of the MSC's certification standard and related

processes for commercial fisheries (Maine lobster) with common management and policy regimes, geographical areas, harvesting methods, traceability etc.

Assessment team's response: No response is required.

For the most part, the Maine lobster fishery's high annual landings over the past several years appear to be driven by a combination of factors, including positive year-to-year stock recruitment and productivity outcomes, and favorable environmental conditions. Proven conservation and stewardship measures, ongoing advances in scientific knowledge and understandings, and an effective stakeholders' engagement process are contributing factors to the harvesting sector's successes.

Sustainable fish stocks (Principle 1 – Score 85.6). *A fishery must be conducted in a manner that does not lead to overfishing or depletion of the exploited populations, and for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.*

The assessors concluded that 6 of the 7 Performance Indicators for this Principle met the minimum overall score of 80. Performance Indicator 1.2.2 (well defined and effective harvest control rules are in place) scored 65 and requires a Condition in order to improve the score to the SG 80 level.

Minimising environmental impact (Principle 2 – Score 81.3). *Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.*

Of the 15 Performance Indicators, the assessors determined that 2 failed to achieve the minimal SG score of 80. Conditions were assigned for Indicators 2.2.3 (collection of data) and 2.4.2 (partial strategy is in place to ensure the fishery does not pose a risk of serious harm or irreversible harm to habitats).

Effective management (Principle 3 – Score 81.3). *The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.*

Of the 9 Performance Indicators, the assessors concluded that 3 failed to meet the SG 80 score. Conditions were established for Indicators 3.1.3 (long-term objectives for the fishery), 3.2.1 (definition and adoption of clear long-term objectives for the fishery), and 3.2.4 (formal research plan).

Assessment team's response: No response is required.

Recommendations

I would like to offer a non-binding recommendation for consideration by the parties as a means of drawing attention to a specific element of the assessment which I feel should be considered during the annual surveillance audit phase.

PI 2.3.2

The strategy for managing the fishery's impact on ETP species, other than Right whales and Humpback whales, should be expanded to include the remaining ETP species listed in the scoring table. This additional focus of work should form part of the to-be-developed Research Plan.

Assessment team's response: the assessment team acknowledges the reviewer for his comment. Regarding the impacts of the lobster fishery on ETP species, the main concern is the impact on large whales. Although the ALWTRP focuses on right, humpback and fin whales, other ETP species such as

other marine mammals and sea turtles also benefits from the Plan. The DMR 2010-2012 Research Plan includes a section on the protection and the management of marine mammals and sea turtles. Subject to positive certification decision, the assessment team will review any changes to the ALWTRP and the updating of the DMR research plan during surveillance audits to ensure that the research plan provides a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with both MSC's Principles 1 and 2.

Performance Indicator Review

Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
<i>Example: 1.1.2</i>	No	No	NA	<i>The certifier gave a score of 80 for this PI. The 80 scoring guidepost asks for a target reference point that is consistent with maintaining the stock at Bmsy or above, however the target reference point given for this fishery is Bpa, with no indication of how this is consistent with a Bmsy level.</i>	
1.1.1	Yes	Yes	NA	The GOM lobster stock is not depleted and overfishing is not occurring. There is a high degree of certainty that the stock is above the point where recruitment would be impaired. From 2007 to 2013 landings nearly doubled, reaching the time series high of 64,087 mt in 2013. The assigned score of 100 for this Performance Indicator is justified.	No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.2	Yes	Yes (marginally)	NA	<p>The Justification sections for both SI a (reference points) and b (limit reference points) adequately describe how the setting of limit and target reference points for the fishery has evolved. The current model consists of a number of inputs and assumptions around these inputs which suggest that the robustness of the model is unproven and a work in progress. Were it not for the overall health status of the stock and harmonization requirements, an argument could be made to establish a condition for this Performance Indicator. That said, SI c appropriately recognizes the uncertainties associated with SI b. I reluctantly agree with the overall SG80 score assigned for this indicator. Note: the statement at the end of SI a indicates that SG80 has not been met.</p>	<p>The conclusion at the end of SIa has been corrected to indicate that SG 80 has been met, as was obviously intended.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.3	NA	NA	NA	I agree that the GOM lobster stock is not depleted; hence, consideration of the elements for this Indicator is not necessary. Note: the meaning of NS is not defined; perhaps it means 'not scored'. Table 16 (p 108) uses NA.	NS has been replaced by NA.
1.2.1	Yes	Yes	NA	The evidence introduced for this PI and resulting analyses and conclusions are appropriate, and justify an overall score of 85; specifically all issues meet the SG80 (ie. SI a and b); a few achieve higher performance at SG 100 (ie.SI d); but most do not meet SG100 (ie. SI a,b and c).	No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.2	Yes	Yes	Yes	I agree with the analysis of the evidence reported in the Justification sections provided for SI a and b wherein it is noted that predetermined management actions that would constitute well-defined harvest control rules have not been adopted for the GoM lobster fishery, and there is no risk analysis associated with the reference points to guide management decision making. As for SI c, while I agree the evidence supports a score of 80, I did not see an explanation offered as to why the SG100 level should be rejected.	Additional rationale has been added to the evaluation table to explain why SIc does not meet SG100, as follow: "Given the lack of harvest control rules and risk analysis associated with reference points, there is no clear evidence that the management system is prepared to maintain exploitation below the reference level if/when abundance declines from current high levels. A score of 80 can be justified for SIc, but not 100."
1.2.3	Yes	Yes	NA	I am in agreement with the analysis of the evidence listed in the Justification sections and related scoring for the three SIs. Moreover, the assessors are correct to point out that for SI a 'there is a need for better understanding of the relationship between environmental drivers (temperature) and recruitment, to enhance predictive capabilities of YOY indices and to incorporate environmental data into population modelling.'	No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.4	Yes	Yes	NA	The information presented in the Justification section is complete and relevant to the requirements for the Performance Indicator. The scoring at the SI and PI levels is also appropriate.	No response is required.

2.1.1	Yes	Yes	NA	<p>Evidence relied upon to score this indicator is clearly presented and referenced for the most part. However,</p> <ul style="list-style-type: none"> • it is not clear to me why herring, as the only main retained species with an acknowledged 'high degree of certainty that the species is within biologically based limits and fluctuating around the target reference point' would have a "Y" for SI c at SG60 and 80 instead of a "NA"; • for SI a, no explanation is offered as to why skates do not meet the SG100 level; • the overall score of 85 for the Performance Indicator may well be appropriate but it is unclear how a single score can be calculated given the different realities/outcomes for some retained species; • for SI d, an "N" should be added in recognition of the fact that the 2 crab species do not have biologically-based limits; and • a comment should be inserted in support of the position taken by the Menhaden Technical Committee regarding new reference points. This could be in the form of a non-binding recommendation. 	<p>The assessment team acknowledges the reviewer for his comments.</p> <p>The assessment team agrees and it has been changed to NA.</p> <p>The rationale now includes an explanation to why skates do not meet SG100.</p> <p>The reference to MSC CR 27.10.7.4 has been added as well as the score for all the different scoring elements</p> <p>The assessment team disagrees. This SI does not deal with stock status of retained species which is considered in SI a. SI d deals with whether or not measures are in place to ensure that the fishery does not cause retained species to be outside biologically based limits in the case that status is poorly known. The rationale states that the status of crab species is poorly but explain why the fishery does not cause crab species to be outside biologically based limits.</p> <p>The assessment team clearly informed that the Atlantic menhaden technical committee does not feel that current reference points are appropriate and recommends a new set of reference points. This uncertainty is reflected in the score assigned , as menhaden does not meet 100a.</p>
2.1.2	Yes	Yes	NA	<p>Evidence relied upon to score this indicator is clearly presented and</p>	<p>A clear rationale has been provided for each SI.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				referenced for the most part. While the overall score of 90 for the Performance Indicator may well be appropriate, it is unclear how it was derived since SIs b, c and d do not appear to have been confirmed. Individual scores should be provided so that an understanding can be arrived at to explain how the overall score was calculated, particularly in view of the conclusion reached for the crab species. Also, it is equally unclear why SI e was deemed to be irrelevant; it should have been scored in my opinion.	The reference to MSC CR 27.10.7.4 has been added as well as the score for all the different scoring elements The assessment team disagrees with the comment regarding SI e. Neither shark species is retained so SI e is not relevant for the lobster fishery.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.3	Yes	Yes	NA	Evidence relied upon to score this indicator is clearly presented and referenced for the most part. While the overall score of 85 for the Performance Indicator may well be appropriate, it is unclear how it was derived since SIs b and c do not appear to have been confirmed. Individual scores should be provided so that an understanding can be arrived at to explain how the overall score was calculated, particularly in view of the conclusions reached for the crab, skate and menhaden species.	A clear rationale has been provided for each SI. The reference to MSC CR 27.10.7.4 has been added as well as the score for all the different scoring elements.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.2.1	Yes	Yes	NA	<p>The assessors have raised concerns with respect to the vulnerability of cod, cusk, yellowtail flounder and witch flounder as main bycatch species. They conclude that a partial strategy exists to ensure that the lobster fishery does not hinder the recovery of these species. This determination is justified for the reasons listed.</p> <p>Given that none of the SIs appears to have been scored, I am unable to ascertain how the overall score of 85 was calculated.</p>	<p>The assessment team disagrees. Bycatch species have been scored for each SI.</p> <p>To provide clarity, the reference to MSC CR 27.10.7.4 has been added as well as the score for all the different scoring elements.</p>
2.2.2	Yes	Yes	NA	<p>The analysis contained in the Justification sections support the scores for each SI including the overall score of 80.</p>	No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.2.3	Yes	Yes	Yes	I agree that a condition is warranted in view of the shortcomings associated with the ongoing sampling programs' infrequent compilation of bycatch data, and the assessors' conclusion that the data collected are not sufficient to detect any increase in risk to main bycatch species.	No response is required.
2.3.1	Yes	Yes	NA	The analysis provided in the Justification sections support the scores for each SI including the overall score of 90.	No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.3.2	Yes	Yes	NA	<p>For SI a, an explanation should be provided as to why the strategy for managing the fishery's impact on ETP species was determined not to be "comprehensive". In other words, what elements of the strategy are missing.</p> <p>For SI b, the evidence cited is limited to Right whales and Humpback whales. The implications for other ETP species should form part of the strategy moving forward. <u>I recommend that this additional work be addressed as part of the research plan condition for PI 3.2.4 and progress be evaluated as part of the annual surveillance audit process.</u></p>	<p>An explanation has been provided in SI a.</p> <p>Regarding the impacts of the lobster fishery on ETP species, the main concern is the impact on large whales. Although the ALWTRP focuses on right, humpback and fin whales, other ETP species such as other marine mammals and sea turtles also benefits from the Plan. The DMR 2010-2012 Research Plan includes a section on the protection and the management of marine mammals and sea turtles.</p> <p>Subject to positive certification decision, the assessment team will review any changes to the ALWTRP and the updating of the DMR research plan during surveillance audits to ensure that the research plan provides a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with both MSC's Principles 1 and 2.</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.3.3	Yes	Unclear	NA	The PI has been assigned a score of 85. The conclusion I reach is that SI b and c were scored at 80, meaning that SI a would have been awarded a higher score (perhaps 90 in recognition that some species received a "Y" and others a "N"). If this reasoning is correct, then SI a received a "partial" score which, according to FCR scoring guidance, is not permitted except for single SIs. Regardless, the score assigned for SI a should be indicated. Additionally, an explanation as to how the PI's overall score was arrived at would be beneficial in the interest of clarity.	The overall score of a PI is obtain by combining scores of the different scoring elements, meaning species; not by assigning an overall score for each SI. To provide clarity, the reference to MSC CR 27.10.7.4 has been added as well as the score for all the different scoring elements.
2.4.1	Yes	Yes	NA	I agree with the analysis of the evidence provided in the Justification section and scoring for this Performance Indicator.	No response is required.
2.4.2	Yes	Yes	Yes	The decision to assign a condition for this Performance Indicator is supported by the evidence as provided and interpreted.	No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.3	Yes	Yes	NA	I agree with the assessors' interpretation of the evidence and resulting scores. It would be helpful if a comment was provided to indicate why SI a did not meet the SG 100 level.	An explanation to why SG100 is not met has been added.
2.5.1	Yes	Yes	NA	I agree with the interpretation of the evidence provided in the Justification section and scoring for this Performance Indicator.	No response is required.
2.5.2	Yes	Yes	NA	I agree with the content of the Justification sections and scoring of the SIs including the overall score for the Performance Indicator.	No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.3	Yes	Yes	NA	I agree with the interpretation of the evidence presented in the Justification sections and scoring of the SIs including the overall score for the Performance Indicator. For SI d, it would be beneficial if a comment was inserted to explain why SG 100 was not achieved; similarly, for SI e, an indication should be given as to what information is considered insufficient to meet SG 100.	The rationale for SI d and e clearly explains why SG 100 is not met. However, the following “preventing the fishery from meeting SG100” has been added for more clarity.
3.1.1	Yes	Yes	NA	I agree with the analysis of the evidence advanced in the Justification sections as well as the scoring of the SIs including the overall score for the Performance Indicator.	No response is required.
3.1.2	Yes	Yes	NA	I agree with the analysis of the evidence advanced in the Justification sections as well as the scoring of the SIs including the overall score for the Performance Indicator.	No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.3	Yes	Yes	Yes	This Performance Indicator is characterized by a single SI, thereby allowing for a "partial" score to be considered. I agree that the analysis of the evidence supports a score of 70 (hence a condition) which I presume reflects the view that the consultation process provides opportunity and encouragement for all interested and affected parties to be involved but does <u>not</u> facilitate their effective engagement.	No response is required.
3.1.4	Yes	Yes	NA	This Performance Indicator is also characterized by a single SI, thereby allowing for a "partial" score to be considered. I agree that the analysis of the evidence supports a score of 90 based on a recent review of the lobster fishery's limited licensing entry system.	No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.1	Yes	Yes	Yes	This Performance Indicator is also characterized by a single SI, thereby allowing for a "partial" score to be considered. I agree that the analysis of the evidence supports a score of 70 owing to the absence of a State-specific set of fishery objectives for that component of the lobster fishery under State jurisdiction.	No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.2	Yes	Yes	NA	I agree with the majority of the findings as set out under the SIs for this Performance Indicator. I do think it would be beneficial if a comment was provided as to why the evidence in regard to SI b was insufficient to progress to the SG 100 level. More importantly perhaps is that the evidence cited under SI d omitted reference to "comprehensive information on fishery performance". If there is no evidence to this effect, then the assigned score of SG 100 should be re-considered.	The following sentence has been added to SI b: "There is no evidence that indicates decision-making processes respond to all issues identified." With the addition of the sentence indicated above, the Assessment Team stands by its conclusion that the Maine's DMR's public hearing process constitutes formal reporting to all interested stakeholders, provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations in respect of specific lobster management issues or proposals.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.3	Yes	Yes	NA	The analysis of the evidence provided for this Performance Indicator is well presented and supports the scores assigned for each SI. However, it is noteworthy to point out that the data used to evaluate certain components of the protection and enforcement program including the outcomes of court cases cover only the first 6 months of 2015. In the absence of a longer data time series and related trend analysis, the short timeframe makes it difficult to independently determine whether the protection and enforcement program is comprehensive and effective in deterring unauthorized fishing	Based on the Assessment Team overall judgement on the status of this PI in relationship to DMR's lobster enforcement and surveillance activities the scoring is maintained.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.4	Yes	Yes	Yes	<p>I agree with the assessors that this Performance Indicator requires a condition. As pointed out, extensive research activities are routinely conducted by government, academia, environmental groups and not-for-profit foundations. The evidence confirms this while noting a general absence of ongoing research on bycatch species and the fishery's impact on habitat/ecosystem.</p> <p>A systematic and comprehensive research plan is required which supports the achievement of objectives consistent with Principles 1 and 2.</p> <p>A formal research plan may take different forms, and given the amount of research activities that are undertaken, it should be relatively straightforward to extract the required information and organize it in a presentable format. A logical starting point would be to update the DMR's 2010-2012 Research Plan.</p>	No response is required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.5	Yes	Yes	NA	<p>I agree with the analysis of the evidence advanced in the Justification sections as well as the scoring of the SIs including the overall score for the Performance Indicator.</p> <p>I do, however, think that for SI a, it would be beneficial if a comment was inserted to explain what aspects of the fishery's management system were not currently evaluated.</p>	<p>The Assessment Team's conclusion on SI (a) was that there are mechanisms in place to evaluate key but not all parts of the GOM lobster fishery management system.. In particular, the evaluation of P2 considerations such as ecosystem effects is scanty as is some P3 factors such as the evaluation of economic conditions and incentives..</p>

Any Other Comments

Comments	Conformity Assessment Body Response
<p>I conclude that this assessment merits a provisional recommendation that the fishery be certified against the MSC Principles and Criteria subject to meeting the conditions and action plan elements as identified in the report. The Management Authorities and their partners, including the client group, have been provided with a clear blueprint for addressing those aspects of the fishery which require improvements.</p> <p>Thank you for the opportunity to participate in this fishery assessment.</p>	<p>The assessment team would like to clarify that meeting the conditions and actions elements is not a condition for certification but will be assessed at the surveillance audits (subject to the decision of certification) and is a condition for maintaining the certification.</p>

For reports using the Risk-Based Framework: Not Applicable

Appendix 3. Stakeholder submissions



THE HUMANE SOCIETY
OF THE UNITED STATES

Eric L. Bernthal, Esq.
Chair of the Board

Jennifer Leaning, M.D., S.M.H.
Vice Chair

Jason Weiss
Second Vice Chair

Kathleen M. Linehan, Esq.
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G. Thomas Walte III
Treasurer & CFO

Andrew N. Rowan, Ph.D.
*Chief International Officer
& Chief Scientific Officer*

Roger A. Kindler
*General Counsel
Vice President & CLO*

Amy C. Rodgers
Secretary

Orla Minogue
Fisheries & Aquaculture Administrator
SAI Global Assurance Services / Global Trust
Quayside Business Park, Mill Street
Dundalk, County Louth, Ireland.
Submitted via: orla.minogue@saiglobal.com

September 12, 2014

RE: Stakeholder Notification of Fishery entering Full Assessment for: Gulf of Maine Lobster (*Homarus americanus*) Fishery

Dear Ms. Minogue,

On behalf of the members and constituents of The Humane Society of the United States, I am submitting the following comments questioning the wisdom of certifying The Gulf of Maine lobster Fishery as sustainable.

DIRECTORS

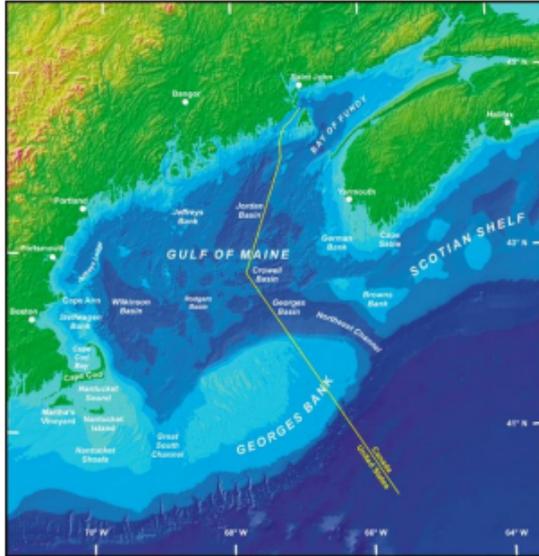
Jeffrey J. Arciniaco
Eric L. Bernthal, Esq.
Jerry Cesak
James Costos
Anita W. Coupe, Esq.
Neil B. Fang, Esq., CPA
Jane Greenspun Gale
Cathy Kangas
Paula A. Kislak, D.V.M.
Jennifer Leaning, M.D., S.M.H.
Kathleen M. Linehan, Esq.
John Mackey
Mary I. Max
Patrick L. McDonnell
Judy Ney
Sharon Lee Patrick
Judy J. Peil
Marian G. Probst
Jonathan M. Ratner
Joshua S. Reichert, Ph.D.
Walter J. Stewart, Esq.
Andrew Weinstein
Jason Weiss
David O. Wiebers, M.D.
Lona Williams

As an initial matter, we believe that the fishery being evaluated is mis-named. The Marine Stewardship Council's (MSC) press announcement that the fishery is undergoing assessment stated that the fishery in question "covers all commercial vessels licensed by the State of Maine or the National Marine Fisheries Service (NMFS) that fish within the Atlantic States Marine Fisheries Commission (ASMFC) Lobster Conservation Management Area 1, which includes the Gulf of Maine stock in coastal Maine and Northwest Atlantic FAO area 21." However, Lobster Management Area 1 is merely a *subset* of the Gulf of Maine. Figure 1 (below), which is from the National Marine Fisheries Service, Northeast Fishery Science Center, depicts the Gulf of Maine. If the fishery being certified is only that section of the lobster fishery that uses Lobster Management Area 1, it should be so-named.

We note that the press release went on to refer consistently to "Maine" and "Maine lobster," stating that "[t]he fishery is managed jointly by the NMFS, ASMFC, and the Maine Department of Marine Resources. In 2013, fishermen landed 126 million pounds of Maine lobster with a landed value of \$364 million. The Maine lobster fishery accounts for more than two thirds of all lobster landings in the United States. " [emphases added] It appears that you intend to consider certifying lobster caught by fishermen from Maine who either fish under a license from the state of Maine or from the U.S. Federal government and that the fishery in question would not include lobster caught under license by any other state bordering the Gulf of Maine.

Please more appropriately name and identify the fishery that you are intending to certify.

Figure 1. The Gulf of Maine, NOAA/NEFSC



The Status and Trends of the Lobster Stock

While lobster landings in Northern New England have been increasing in recent years, particularly in the state of Maine, this may be a short-term and unsustainable boom. Providing additional incentive to harvest lobsters in this area may have a fiscal benefit in the immediate future; however, a belief in the long-term continuance of this level of abundance and harvest would appear naïve.

On September 3 of this year, reporting by national media outlets discussed the shifting distribution of fishery resources in the Gulf of Maine, including that of lobster¹. Both academic scientists and conservation organizations were quoted expressing concerns that there could soon be a “Maine without lobster.” Studies show that the Gulf of Maine is warming rapidly. Andy Pershing, chief scientific officer at the Gulf of Maine Research Institute has stated that, just since 2004, the Gulf of Maine is warming faster than 99 percent of the world’s oceans, a statistic that has been accepted by the NOAA Fishery Science Center. Pershing found that temperatures in the Gulf of Maine are now increasing at about a half-degree per year, a rate nearly 10 times faster than the 0.05 degrees per year increase seen in 1982 through 2004.

Diane Cowan, founder of the Lobster Conservancy, who has conducted lobster censuses in New England for 22 years, was also quoted in reporting. She stated that, as recently as 2007 her research off Maine’s Friendship Long Island yielded numerous young lobsters (e.g., she stated, until 2007, she couldn’t lift a rock without finding one) but in this current year she only found 19 in her entire study site. Further, Bob Steneck, a professor at the University of Maine’s School of Marine Sciences, has stated that, “ironically, the warmer water has created ideal conditions for lobsters and contributed to an overabundance in

¹ Cape Cod without cod? Maine without lobster? Gulf of Maine: 'Poster child' for global warming. WCVB. September 3, 2014.

Available at: <http://www.wcvb.com/news/cape-cod-without-cod-maine-without-lobster/27851960#ixzz3D15009dt>

recent years, causing prices to tumble to their lowest point in nearly two decades in Maine. But warming is on a path to force them to move north or die off.”

Indeed, both industry publications and mass media reporting have been documented the growing concern that the lobster shell disease that has plagued lobster fisheries in Southern New England, is now starting to affect lobsters in Maine to an increasing degree². This disease, which reduces health and marketability of lobsters, is linked to the creep of warming water temperatures and lower oxygenation.³

We believe that there is a growing body of literature to suggest that the current boom in lobster harvests is short-term and likely to be followed by a “bust” that may be exacerbated by increased harvests resulting from a naïve belief that the current situation will last in perpetuity. At the very least, the Marine Stewardship Council (MSC) must query the sources quoted in press stories for the data that they are citing and consider that this recent-term boom in lobster landings is likely very short-term and certification is ill-advised.

Protected Species Bycatch in the Lobster Fishery

One of the facets the MSC’s evaluation must consider is the incidental bycatch of protected species of marine mammals. The ongoing high levels of entanglement of large endangered whales in the lines typically used in lobster fishers in the Gulf of Maine should give pause as to the “sustainability” of the fishery from an ecosystem point of view.

According to one of the only published studies of fishing gear involved in the entanglement of large endangered whales, lobster pot gear was the second most common gear type removed from humpback whales (only gillnets were higher) and right whales were entangled equally in inshore and offshore gear, where gear type could be identified⁴. Because the origin of the gear is often not known (i.e. ropes entangling whales could be originate in Canada or from the state or federal waters of the U.S. because gear marking is insufficient to identify origin of the gear); it would be disingenuous to claim that no entanglements of right whales have been reported from Maine or any particular lobster fishery; though, as we will discuss below, there is evidence that Maine in particular contributes to this problem.

The NMFS stated in published Biological Opinions issued under the U.S. Endangered Species Act (ESA) that no fishery-related mortality of critically endangered North Atlantic right whales could be legally permitted under the standard set by the ESA (which prohibits incidental mortality of marine mammals in fisheries unless the level of mortality will have a less than a “negligible impact” on listed species). The Marine Mammal Protection Act (MMPA) requires that the NMFS set a Potential Biological Removal” (PBR) level for each species under its jurisdiction and its regulations have stipulated that “negligible impact” is no more than 10 percent of the PBR⁵. The PBR is defined in the statute as “the maximum

² See for example: “Lobster shell disease creeping northward to Maine”. AP. August 11,2013. Available at: <http://bigstory.ap.org/article/lobster-shell-disease-creeping-northward-maine> and “Lobster Shell Disease: Hunting for an Answer”. Fishermen’s Voice. October 2012. Available at: <http://www.fishermensvoice.com/201210LobsterShellDisease.html>

³ Id.

⁴ Johnson, A., G. Salvador, J. Kenney, J. Robbins, S. Kraus, S. Landry, P. Clapham. 2005 “Fishing Gear Involved in Entanglement of Right and Humpback Whales” *Marine Mammal Science* 21(2) 635-645)

⁵ Waring, G., E.. Josephson, K. Maze- Foley, and P.E. Rosel.(eds). U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2013. NOAA Technical Memorandum NMFS-NE-228. See Humpback whale SAR in the section

number of animals, not including natural mortalities that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.” For ESA-listed North Atlantic right whales, the PBR is 0.9. For humpback whales the PBR is 2.7. Despite this, the NMFS’ annual stock assessment reports document mortality well above these levels. For right whales, the Stock Assessment reports at least 3.25 annual fishery-related mortalities and 9.95 annual fishery-related mortalities of humpback whales⁶. Not only are these levels of mortality not “negligible,” but they exceed the level that will allow unimpeded recovery of endangered species.

Although lack of sufficient gear marking means that the exact location of most of the entangling gear is not discernable, most of it likely originates in the Gulf of Maine where there are the greatest number of risk-prone vertical lines (i.e., out of 475,300 vertical lines in the Northeast, over 205,000 were in non-exempt waters in Lobster Management Area 1).⁷ The most recent NMFS stock assessment documents 52 fishery-related mortalities and serious injuries to endangered humpback whales over the 5-year review period.⁸ Most of these were from unidentified fisheries. Of the eight serious injuries and mortalities that were identifiable to a fishery, one quarter (2/8) were identified as being from the lobster fishery and these dead whales were found in the Gulf of Maine.⁹

There are some limited data that indicate that lobster gear originating in Maine itself poses a significant risk. Between 2002 and 2005, for example, lobster gear traced to Maine accounted for 23% of all large whale entanglements, the single largest source of all entangling gear where the origin could be determined¹⁰. Between 1997 and 2005, 37% (3/8) of reported right whale entanglements involved Maine lobster gear¹¹. The NMFS is woefully sluggish in publishing data on the origin or cause of death. The most recent stock assessment reports have data no more recent than 2011 although serious entanglements and deaths have occurred since that time .

In its most recent report to the NMFS Take Reduction Team (TRT) of which we are an appointed member, the agency documented 21 newly entangled humpback and right whales in 2010 and 30 newly reported entanglements of humpback and right whales in 2011 (through the month of November).¹² As of the most recent meeting of the TRT in 2012, the NMFS had made no attempt to identify the origin of this gear found on whales. Some percentage of these animals that could not be successfully disentangled or were unable to shed the gear will subsequently die, though the exact number is not known. The NMFS Stock Assessment acknowledges that many of the whales that die from

of Status of the Stock. Available at: http://www.nmfs.noaa.gov/pr/sars/2013/ao2013_humpbackwhale-gulfofmaine.pdf

⁶ Waring, G., E., Josephson, K. Maze- Foley, and P.E. Rosel.(eds). U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2013. NOAA Technical Memorandum NMFS-NE-228. Available at:

http://www.nmfs.noaa.gov/pr/sars/pdf/ao2013_tm228.pdf

⁷ ALWTRP Vertical Line Model: Analysis of Current Proposals. Powerpoint presentation prepared for the Atlantic Large Whale Take Reduction Team January 2012. NMFS/NERO. Prepared by IEc. Cambridge MA. Available from NMFS, NERO

⁸ Waring et al., OpCit.

⁹ Id.

¹⁰ NMFS 2007. Preliminary Summary of NMFS Gear Analysis for Entangled Large Whales for the years 1997-2007 by species. Provided to the Atlantic Large Whale Take Reduction Team on April 28, 2008.

¹¹ Id.

¹² 2010-2011 Preliminary Large Whale and Ship Strike Summary, Presented to the January 2012 meeting of the TRT. Available at: http://www.greateratlantic.fisheries.noaa.gov/whaletrp/trt/meetings/2012/4b_2010-11%20Preliminary%20Large%20Whale%20Data.pdf

anthropogenic causes will not be detected¹³ and North Atlantic right whale researchers published an estimate that there is likely only a 17% detection rate for animals that die subsequent to a serious injury.¹⁴

There is no question that the lines, primarily vertical lines, used by lobster fisheries in the Gulf of Maine, have entangled and killed, and will continue to entangle and kill, endangered large whales. The most recent NMFS take reduction plan for large whales stipulates that the changes made to its management measures will only result in a 38% reduction in the likelihood of vertical lines and endangered whales co-occurring in the same area.¹⁵ This is insufficient to meet the mandates of the U.S. MMPA, which indicates that the current rate of fishery-related right whale mortality (3.25 per year) must be reduced by at least 70% to attain the MMPA mandate of keeping mortality below the PBR (i.e., 0.9). The lobster fishery continues to pose a significant risk.

This is also illustrated by several very recent incidents in the Gulf of Maine. On June 23, 2014, an aerial survey team from the NMFS Science Center spotted a badly entangled right whale on Georges Bank, it was described as an “extensive” entanglement and the whale was said to be pale and thin. There are no documented sightings of this whale since that time. On July 1, a humpback whale was seen entangled and anchored in lobster gear near the mouth of the Bay of Fundy. But for its good fortune of being spotted by a Bar Harbor whale watch boat—that alerted disentangers—the whale likely would have died while anchored in heavy lobster gear in worsening weather conditions. On July 13th, NMFS was notified of a Youtube video showing sharks scavenging a carcass of a dead right whale that appeared to have line on its body as it floated east of Cape Cod; the US Coast Guard relocated this carcass on July 17th but it could not be towed to shore for a necropsy. On July 18, 2014, a small humpback whale was seen entangled and described as being in “quite poor” condition in Cape Cod Bay and has not been documented alive since then. On September 4, 2014, researchers operating near Grand Manan spotted a seriously entangled right whale. Their concern that this may be a lethal entanglement prompted an alert to other researchers to assist in trying to re-sight and disentangle this whale. On September 6th, a dead and decomposing right whale was spotted entangled in rope south of Newfoundland.¹⁶

The MSC cannot dismiss the significant risk that the lobster fishery in the Gulf of Maine poses to endangered large whales. The bycatch-related rate of mortality and serious injury is retarding their recovery.

¹³ Supra footnote 6 for humpback and right whale stock assessments.

¹⁴ Kraus, S., M. Brown, H. Caswell, et al. North Atlantic Right Whales in Crisis. 2005. Science. The American Academy of Sciences. V. 309 22 JULY 2005 Available at: <http://www.eswr.com/docs/805/rtwhalesciencearticle.pdf>

¹⁵ See Chapter 8. Final Environmental Impact Statement on Amendments to the Atlantic Large Whale Take Reduction Plan. Available at: <http://www.greateratlantic.fisheries.noaa.gov/protected/whaletrp/eis2013/index.html> Note that the Agency contractors (Industrial Economics) state that co-occurrence scores are generated by a model that incorporates information on “fishery effort and whale sightings and identifies areas and times at which whales and commercial fishing gear are likely to co-occur. The final product is a set of indicators that provide information on factors that contribute to the risk of entanglement at various locations and at different points in time.” Thus a 38% reduction in a co-occurrence score for the Northeast is roughly an estimate of the reduction in the likelihood of a whale encountering—and potentially becoming entangled in—a vertical line used in the lobster fishery to which the take reduction plan pertains.

¹⁶ These 2014 incidents (and quite a number that were less serious in nature) were reported to the Large Whale Disentanglement Network. Archives are maintained by the Center for Coastal Studies in Provincetown in collaboration with New England Aquarium and the NMFS, and may be obtained from these institutions.

Conditions of Operations

It is common in MSC assessments to require conditions of fisheries that it certifies. We note that, for the Canadian lobster fishery, the MSC required the fishery to report any large whale entanglements, particularly mortalities, of marine mammals found in gear used by the fishery within its operating range. This relies on fishermen acting against their best interest by reporting the entanglement of a right whale or humpback whale, knowing that documented bycatch of endangered species may have severe consequences for them. Indeed, voluntary reporting is usually unreliable. Credle and her co-authors found that fisher self-reports of marine mammal bycatch are substantially negatively biased.¹⁷ The MSC cannot reasonably expect fishers to self-report an incident that could cost them their MSC certification or result in further federal restrictions on their fishery.

In closing, we believe that concerns about the long-term sustainability of the harvest of lobsters and, more importantly, the high levels of incidental mortality of endangered whales in gear consistent with the fishery argue strongly against MSC certification.

Thank you for your consideration. Please let me know if you have questions about our comments.

Sincerely,

A handwritten signature in black ink that reads "Sharon B. Young". The signature is written in a cursive style with a large, sweeping "S" at the beginning and a long, thin tail on the "y".

Sharon B. Young
Marine Issues Field Director
The Humane Society of the U.S.
syoung@humanesociety.org
508-833-0181

Assessment team's response



August 26, 2016

Sharon B. Young
Marine Issues Field Director
The Humane Society of the U.S.
1255 23rd Street, NW, Suite 450
Washington, DC 20037

Re: Humane Society of the U.S. Submission regarding the MSC full assessment of the Gulf of Maine Lobster fishery

Dear Sharon,

The assessment team appointed to conduct the MSC full assessment of the Gulf of Maine Lobster Fishery has reviewed your submission and discussed the concerns you have raised in relation to the long-term sustainability of the harvest of lobster and the impacts on ETP species and particularly to whales. We do take your concerns seriously and would like to make the following responses.

As an initial matter, we believe that the fishery being evaluated is mis-named. The Marine Stewardship Council's (MSC) press announcement that the fishery is undergoing assessment stated that the fishery in question "covers all commercial vessels licensed by the State of Maine or the National Marine Fisheries Service (NMFS) that fish within the Atlantic States Marine Fisheries Commission (ASMFC) Lobster Conservation Management Area 1, which includes the Gulf of Maine stock in coastal Maine and Northwest Atlantic FAO area 21." However, Lobster Management Area 1 is merely a *subset* of the Gulf of Maine. Figure 1 (below), which is from the National Marine Fisheries Service, Northeast Fishery Science Center, depicts the Gulf of Maine. If the fishery being certified is only that section of the lobster fishery that uses Lobster Management Area 1, it should be so-named. We note that the press release went on to refer consistently to "Maine" and "Maine lobster," stating that "[t]he fishery is managed jointly by the NMFS, ASMFC, and the Maine Department of Marine Resources. In 2013, fishermen landed 126 million pounds of Maine lobster with a landed value of \$364 million. The Maine lobster fishery accounts for more than two thirds of all lobster landings in the United States." [emphases added] It appears that you intend to consider certifying lobster caught by fishermen from Maine who either fish under a license from the state of Maine or from the U.S. Federal government and that the fishery in question would not include lobster caught under license by any other state bordering the Gulf of Maine. Please more appropriately name and identify the fishery that you are intending to certify.

Assessment team's response

The name of the fishery was determined by the fishery client and SAI Global, and is appropriate and conformed with the two criteria set in Table GC1 of the Guidance to MSC CR v1.3: the name should be unique and unambiguous. In addition to specify the species for which certification is sought, the

name may also incorporate details of the geographical location. The geographical location where the fishery under assessment is operating is the Gulf of Maine and more specifically in LCMA 1.

The fishery under assessment (Unit of Certification) is clearly defined in the section 2 of the Public Comment Draft Report (PCDR): the Gulf of Maine lobster fishery under assessment covers all commercial vessels licensed by the State of Maine and NMFS that land and sell lobster to the MCSLA and fish within LCMA 1, which includes the Gulf of Maine stock in coastal Maine and Northwest Atlantic FAO area 21.

We confirm that the fishery under assessment only covers lobster caught in LCMA 1 by from fishers from Maine and does not include lobster caught under licence by any other state bordering the Gulf of Maine.

According to the 2015 stock assessment⁴⁵, in 2013, State of Maine lobster landings were 115 million pounds (57,797 mt) and Gulf of Maine lobster total landings were 128 million pounds (64,087 mt) (Table 1 in section 4.3.2 of the PCDR).

The Status and Trends of the Lobster Stock

While lobster landings in Northern New England have been increasing in recent years, particularly in the state of Maine, this may be a short-term and unsustainable boom. Providing additional incentive to harvest lobsters in this area may have a fiscal benefit in the immediate future; however, a belief in the long-term continuance of this level of abundance and harvest would appear naïve.

On September 3 of this year, reporting by national media outlets discussed the shifting distribution of fishery resources in the Gulf of Maine, including that of lobster¹. Both academic scientists and conservation organizations were quoted expressing concerns that there could soon be a “Maine without lobster.” Studies show that the Gulf of Maine is warming rapidly. Andy Pershing, chief scientific officer at the Gulf of Maine Research Institute has stated that, just since 2004, the Gulf of Maine is warming faster than 99 percent of the world’s oceans, a statistic that has been accepted by the NOAA Fishery Science Center. Pershing found that temperatures in the Gulf of Maine are now increasing at about a half-degree per year, a rate nearly 10 times faster than the 0.05 degrees per year increase seen in 1982 through 2004.

Diane Cowan, founder of the Lobster Conservancy, who has conducted lobster censuses in New England for 22 years, was also quoted in reporting. She stated that, as recently as 2007 her research off Maine’s Friendship Long Island yielded numerous young lobsters (e.g., she stated, until 2007, she couldn’t lift a rock without finding one) but in this current year she only found 19 in her entire study site. Further, Bob Steneck, a professor at the University of Maine’s School of Marine Sciences, has stated that, “ironically, the warmer water has created ideal conditions for lobsters and contributed to an overabundance in

⁴⁵ ASMFC 2015. 2015 American Lobster Stock Assessment for Peer Review. August 2015.

recent years, causing prices to tumble to their lowest point in nearly two decades in Maine. But warming is on a path to force them to move north or die off.”

Indeed, both industry publications and mass media reporting have been documented the growing concern that the lobster shell disease that has plagued lobster fisheries in Southern New England, is now starting to affect lobsters in Maine to an increasing degree². This disease, which reduces health and marketability of lobsters, is linked to the creep of warming water temperatures and lower oxygenation.³

We believe that there is a growing body of literature to suggest that the current boom in lobster harvests is short-term and likely to be followed by a “bust” that may be exacerbated by increased harvests resulting from a naïve belief that the current situation will last in perpetuity. At the very least, the Marine Stewardship Council (MSC) must query the sources quoted in press stories for the data that they are citing and consider that this recent-term boom in lobster landings is likely very short-term and certification is ill-advised.

Assessment team’s response

As is evident in the section 4.3.4 of the PCDR, summary of the comprehensive consideration of reference points in the report of the 2015 GOM lobster stock assessment, those involved are clearly aware of changing ocean climate throughout the Gulf of Maine. Because of this, they conclude that reference points based on hypothetical equilibrium conditions become unrealistic and unreliable management tools.

Instead, they chose trend-based abundance and exploitation rate reference points based on the 1982-2003 period, clearly acknowledging that this relatively short-time series may not reflect an optimal and sustainable production range for the stock: obviously, reference points which provide the basis for stock status determinations are subject to change. Therefore, any suggestion that the current assessment of stock status is based on a naïve belief in long-term continuation of recent high abundance is unfounded.

While MSC certification has to be based, in part, on assessment of recent/current/projected stock status, it arguably provides a mechanism to help ensure appropriate responses to future changes. Certification requires annual audits of the fishery as well as full reassessment/recertification every 5 years. Subject to a positive decision on certification, in order to maintain certification over the long-term, the management system will have to respond as required to ensure the fishery remains sustainable.

Protected Species Bycatch in the Lobster Fishery

One of the facets the MSC’s evaluation must consider is the incidental bycatch of protected species of marine mammals. The ongoing high levels of entanglement of large endangered whales in the lines typically used in lobster fishers in the Gulf of Maine should give pause as to the “sustainability” of the fishery from an ecosystem point of view.

Assessment team’s response

The Northeast/Mid-Atlantic American lobster trap fisheries have been listed as Category I fisheries on the 2015 List of Fisheries according to the level of interactions that result in incidental mortality or serious injury of marine mammals⁴⁶. Category 1 is fisheries with frequent incidental mortality or serious injury of marine mammals.

⁴⁶ http://www.nmfs.noaa.gov/pr/interactions/fisheries/2015_list_of_fisheries_lof.html

One of the objectives of the full assessment is to assess the sustainability of the Gulf of Maine lobster fishery from an ecosystem point of view using the criteria set in MSC Principle 2. Regarding the impacts of ETP species including large whales, firstly, the assessment team evaluated whether the Gulf of Maine lobster fishery meets the national and international requirements for protection of ETP species, and whether the fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder the recovery of ETP species (MSC Performance Indicator 2.3.1 ETP Species Outcome). Secondly, the assessment team evaluated whether the fishery has in place precautionary management strategies to meet the national and international requirements, to ensure that the fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder the recovery of ETP species, and to minimize mortality of ETP species (MSC Performance Indicator 2.3.2 ETP Species Management Strategy).

According to one of the only published studies of fishing gear involved in the entanglement of large endangered whales, lobster pot gear was the second most common gear type removed from humpback whales (only gillnets were higher) and right whales were entangled equally in inshore and offshore gear, where gear type could be identified⁴. Because the origin of the gear is often not known (i.e. ropes entangling whales could be originate in Canada or from the state or federal waters of the U.S. because gear marking is insufficient to identify origin of the gear); it would be disingenuous to claim that no entanglements of right whales have been reported from Maine or any particular lobster fishery; though, as we will discuss below, there is evidence that Maine in particular contributes to this problem.

Assessment team's response

The assessment team strived to provide a detailed review of the impacts of the Gulf of Maine fishery on ETP species, this review is presented in the section 4.4.3 of the PCDR. Impacts on right and humpback whales is provided on p.64 and our review clearly presents the reported entanglements in lobster traps/pots from Maine. The outcomes of the study from Johnson et al (2005) you cited are, among other, presented. As you highlighted, the results shown that when gear was identified, 89% of the entanglements were attributed to pot and gill net gear, lobster pot being the second most common gear identified in entanglements. But this study also pointed out that the entanglement outcomes of many whales were considered positive, 71% of whales entangled in pot gear were alive and gear-free, primarily due to successful disentanglement.

The NMFS stated in published Biological Opinions issued under the U.S. Endangered Species Act (ESA) that no fishery-related mortality of critically endangered North Atlantic right whales could be legally permitted under the standard set by the ESA (which prohibits incidental mortality of marine mammals in fisheries unless the level of mortality will have a less than a "negligible impact" on listed species). The Marine Mammal Protection Act (MMPA) requires that the NMFS set a Potential Biological Removal" (PBR) level for each species under its jurisdiction and its regulations have stipulated that "negligible impact" is no more than 10 percent of the PBR⁵. The PBR is defined in the statute as "the maximum number of animals, not including natural mortalities that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population." For ESA-listed North Atlantic right whales, the PBR is 0.9. For humpback whales the PBR is 2.7. Despite this, the NMFS' annual stock assessment reports document mortality well above these levels. For right whales, the Stock Assessment reports at least 3.25 annual fishery-related mortalities and 9.95 annual fishery-related mortalities of humpback whales⁶. Not only are these levels of mortality not "negligible," but they exceed the level that will allow unimpeded recovery of endangered species.

Assessment team's response

The PBR means the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum

sustainable population. However, it is important to note that the optimum sustainable population is a population level that is significantly higher than that required for the survival and recovery of the species for purposes of ESA section 7 (NMFS 2014).

NMFS marine mammal stock assessment reports document the fishery-related serious injury and mortality for combined Canada and U.S. fisheries. The assessment team presented the data for the period 2008-2012 from the most recent stock assessment report published (Waring et al 2015). The table below is included in the scoring table of the PI 2.3.1.

Species	PBR	Fishery-related serious injury and mortality (Combined Canada and US fisheries, 2008-2012)
Northern right whale	0.9	3.65 per year
Humpback whale	2.7	8.90 per year
Fin whale	2.5	1.55 per year
Blue whale	0.9	Unknown
Sei whale	0.5	0.4 per year
Sperm whale	3.6	None in US waters
Minke whale	162	7.1
Harbor seal	2,006	431 per year

Although it is clear that the level of fishery related serious injury and mortality is well above the PBR, from 2007-2011 (Waring et al 2014) and 2008-2012 (Waring et al 2015), lobster gear of US or undocumented origin was not recorded in any of serious injury/mortality to right whales. The annual average rate of documented serious injury/mortality events for right whales and humpback whales attributable to lobster gear is less than the PBR for both species. The most recent marine mammals SARs indicate that the level of serious injuries and mortalities of Gulf of Maine humpback whales attributable to U.S. commercial fisheries meets the level necessary to allow for growth to the optimum sustainable population level.

Although lack of sufficient gear marking means that the exact location of most of the entangling gear is not discernable, most of it likely originates in the Gulf of Maine where there are the greatest number of risk-prone vertical lines (i.e., out of 475,300 vertical lines in the Northeast, over 205,000 were in non-exempt waters in Lobster Management Area 1).⁷ The most recent NMFS stock assessment documents 52 fishery-related mortalities and serious injuries to endangered humpback whales over the 5-year review period.⁸ Most of these were from unidentified fisheries. Of the eight serious injuries and mortalities that were identifiable to a fishery, one quarter (2/8) were identified as being from the lobster fishery and these dead whales were found in the Gulf of Maine.⁹

There are some limited data that indicate that lobster gear originating in Maine itself poses a significant risk. Between 2002 and 2005, for example, lobster gear traced to Maine accounted for 23% of all large whale entanglements, the single largest source of all entangling gear where the origin could be determined¹⁰. Between 1997 and 2005, 37% (3/8) of reported right whale entanglements involved Maine lobster gear¹¹. The NMFS is woefully sluggish in publishing data on the origin or cause of death. The most recent stock assessment reports have data no more recent than 2011 although serious entanglements and deaths have occurred since that time .

Assessment team's response

The assessment team acknowledges the fact that in most of the case the fishing gear involved in entanglements cannot be identified. The follow data/information is presented in the background section 4.4.3 of the PCDR. Between 1997 and 2005, 6 entanglements of right whale in lobster gear have been recorded in Atlantic U.S. and Canada, among which 4 were in Maine (Johnson et al 2005). For the period 2007 through 2011, the incidental fishery entanglement records were at 3.25 per year

(all fisheries), which correspond to 17 reported fisheries entanglements (Waring et al 2013 and 2014) in both US and Canada waters (13 located in US). For the period 2008 through 2012, the incidental fishery entanglement records were at 3.65 per year (all fisheries) which correspond to 19 reported fisheries entanglements in both US and Canada waters (12.75 located first in US) (Waring et al 2015). Between 1997-2005, 9 entanglements of humpback whales in lobster gear have been reported, among which 2 were in Maine (Johnson et al 2005). For the period 2007 through 2011, the incidental fishery entanglement records were at 9.95 per year, which corresponds to 53 reported fisheries entanglements (Waring et al 2013 and 2014) for both US and Canada (46 were located first in US). For the period 2008 through 2012, the incidental fishery entanglement records were at 8.90 per year, which corresponds to 50 reported fisheries entanglements (Waring et al 2015) for both US and Canada. This value is well above the PBR of 2.7. Among these 46 records in US, the fishing gear has not been present/recovered in 36 cases; one mortality (George Bank) and one serious injury (Great South Channel) were due to traps; the gear was unidentifiable in 2 cases; gillnet was involved in 4 cases; and hook/monofilament was involved in 2 cases.

The assessment had confirmation that the NMFS is slow to provide entanglements data as “due to the high level of scrutiny, the gear determination process is lengthy and NMFS wants to be sure that all entanglement reports are well documented, fully vetted and as accurate as possible” (Scott Landry and David Mattila, *pers. comm.*)

There is no question that the lines, primarily vertical lines, used by lobster fisheries in the Gulf of Maine, have entangled and killed, and will continue to entangle and kill, endangered large whales. The most recent NMFS take reduction plan for large whales stipulates that the changes made to its management measures will only result in a 38% reduction in the likelihood of vertical lines and endangered whales co-occurring in the same area.¹⁵ This is insufficient to meet the mandates of the U.S. MMPA, which indicates that the current rate of fishery-related right whale mortality (3.25 per year) must be reduced by at least 70% to attain the MMPA mandate of keeping mortality below the PBR (i.e., 0.9). The lobster fishery continues to pose a significant risk.

This is also illustrated by several very recent incidents in the Gulf of Maine. On June 23, 2014, an aerial survey team from the NMFS Science Center spotted a badly entangled right whale on Georges Bank, it was described as an “extensive” entanglement and the whale was said to be pale and thin. There are no documented sightings of this whale since that time. On July 1, a humpback whale was seen entangled and anchored in lobster gear near the mouth of the Bay of Fundy. But for its good fortune of being spotted by a Bar Harbor whale watch boat—that alerted disentanglers—the whale likely would have died while anchored in heavy lobster gear in worsening weather conditions. On July 13th, NMFS was notified of a Youtube video showing sharks scavenging a carcass of a dead right whale that appeared to have line on its body as it floated east of Cape Cod; the US Coast Guard relocated this carcass on July 17th but it could not be towed to shore for a necropsy. On July 18, 2014, a small humpback whale was seen entangled and described as being in “quite poor” condition in Cape Cod Bay and has not been documented alive since then. On September 4, 2014, researchers operating near Grand Manan spotted a seriously entangled right whale. Their concern that this may be a lethal entanglement prompted an alert to other researchers to assist in trying to re-sight and disentangle this whale. On September 6th, a dead and decomposing right whale was spotted entangled in rope south of Newfoundland.¹⁶

Assessment team’s response

The assessment team has no doubt that U.S. lobster fisheries including the Gulf of Maine lobster fishery pose a significant risk to endangered large whales. The 2014 Biological Opinion (NMFS 2014) concludes that US lobster fisheries has the potential to seriously injured or kill an average of 3.25 and 9.05 right whales and humpback whales, respectively.

However, for the purpose of the assessment, the assessment team believes that the key question is not whether or not the Gulf of Maine lobster fishery is involved in entanglements of large whales but is “does the fishery pose a risk of serious or irreversible harm to large whales and does the fishery hinder the recovery of large whales”.

The most recent marine mammals stock assessment report (Waring et al 2015) indicates that the level of serious injuries and mortalities of Gulf of Maine humpback whales attributable to U.S. commercial fisheries meets the level necessary to allow for growth to the optimum sustainable population level. According to this stock assessment report, the right whale shows a positive and slowly accelerating trend in the population size. Similarly, the Gulf of Maine humpback whale population is characterized by a positive trend.

Furthermore, NFMS 2014 biological opinion concludes that fishery interactions are not threatening the continued survival and recovery of the right whale and the humpback whale (p.146, 150, 161). Based on this evidence the assessment team concluded that the Gulf of Maine lobster does not pose a risk of irreversible harm to right and humpback whales and does not hinder their recovery.

The revised recovery plan for right whale and the recovery plan for humpback whales states that the most significant need for right whale recovery is to reduce or eliminate deaths and injuries from anthropogenic activities, including from commercial fishing operations. The Gulf of Maine lobster fishery is complying with the requirements to reduce the take of whales. The ALWTRP was implemented in 1997 and measures implemented evolve to modify fishing operations/practices to reduce the risk of entanglements.

The assessment team contacted the Center of Coastal Studies regarding the 2014 entanglements you mentioned in your letter. The June 23 entanglement event was documented and confirmed but the gear determination will be very unlikely as no gear was recovered and there was no entanglement response (Scott Landry, *pers. comm.*). It was confirmed that by the end of 2014, 14 whale entanglements in the Gulf of Maine have been reported, and that those cases involved humpback, right, fin and minke whales. The details data on date, injury determination, location, country and gear type have not been published to date.

The MSC cannot dismiss the significant risk that the lobster fishery in the Gulf of Maine poses to endangered large whales. The bycatch-related rate of mortality and serious injury is retarding their recovery.

Conditions of Operations

It is common in MSC assessments to require conditions of fisheries that it certifies. We note that, for the Canadian lobster fishery, the MSC required the fishery to report any large whale entanglements, particularly mortalities, of marine mammals found in gear used by the fishery within its operating range. This relies on fishermen acting against their best interest by reporting the entanglement of a right whale or humpback whale, knowing that documented bycatch of endangered species may have severe consequences for them. Indeed, voluntary reporting is usually unreliable. Credle and her co-authors found that fisher self-reports of marine mammal bycatch are substantially negatively biased.¹⁷ The MSC cannot reasonably expect fishers to self-report an incident that could cost them their MSC certification or result in further federal restrictions on their fishery.

In closing, we believe that concerns about the long-term sustainability of the harvest of lobsters and, more importantly, the high levels of incidental mortality of endangered whales in gear consistent with the fishery argue strongly against MSC certification.

Assessment team's response

The Gulf of Maine lobster full assessment is conducted by the assessment team assembled by the accredited CAB contracted to carry out the assessment. The assessment team provided a detailed review of the impacts of the Gulf of Maine fishery on endangered large whales. Based on the evidence presented above, it was concluded that the fishery does not pose a risk of irreversible harm to right and humpback whales and does not hinder their recovery.

A condition is assigned to a Performance Indicator by an assessment team when the score is less than 80. Your statement "for Canadian lobster fishery, the MSC required the fishery to report any large whale entanglements..." is wrong. There are 5 Canadian lobster traps fisheries certified: Eastern Canada offshore⁴⁷, Îles-de-la-Madeleine⁴⁸, Gaspésie⁴⁹, Prince Edward Island⁵⁰, and Bay of Fundy, Scotian Shelf and Southern Gulf of St Lawrence⁵¹. None of them have a condition on ETP species PIs requiring to report any large whale entanglements. Under licence requirements, Canadian lobster harvesters are required to provide information in the *Species at Risk Act (SARA)* Monitoring document on all interaction with species listed under the *SARA*, which includes large whales.

We hope that these responses has dealt with the comments and concerns as outlined in your letter.

Thank you, one again, for having taken the time to communicate with the assessment on this matter.

Yours Sincerely,



Géraldine Criquet
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⁴⁷ <https://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-west-atlantic/Eastern-Canada-offshore-lobster/reassessment-downloads>

⁴⁸ https://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-west-atlantic/iles_de_la_madeleine_lobster/assessment-downloads

⁴⁹ <https://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-west-atlantic/gaspesie-lobster-trap/assessment-downloads>

⁵⁰ <https://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-west-atlantic/prince-edward-island-lobster-trap/assessment-downloads>

⁵¹ <https://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-west-atlantic/bay-of-fundy-scotian-shelf-and-southern-gulf-of-st-lawrence-lobster-trap/assessment-downloads>



CENTRAL WHARF • BOSTON, MASSACHUSETTS • 02110-3399
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September 12, 2014

Dear Ms. Minogue:

We are writing to express our deep concern regarding the proposed MSC certification of the Gulf of Maine lobster fishery. Our concerns have to do with the high levels of bycatch of the critically endangered North Atlantic right whale population as well as other large whale species, and the leatherback sea turtle (also an endangered species). Entanglements in fixed fishing gear, including Gulf of Maine lobster gear, have been well documented for right whales (Knowlton et al 2012). Our study showed that 83% of the population (626 individual whales assessed) has been entangled, with many animals getting entangled repeatedly over their lifetime. The annual rate of entanglement in fishing gear for this species ranges between 15-25%. Worse, entanglements that result in serious injury and mortality have increased significantly over our 30-year study (1980-2009; Knowlton et al. 2012 – see attached). We believe one explanation for this increase in serious entanglements is a technological advance in the mid-1990's that led to the co-extrusion of plastic resins to create stronger fibers and, in turn, stronger ropes. We analyzed the breaking strength of ropes retrieved from large whales, and found it strongly correlated with species size and age – younger and smaller animals are found only in lower breaking strength ropes, whereas adult right whales are found only in the stronger ropes. This finding suggests that younger and smaller whales are unable to break free from stronger ropes and drown. Based on these results, we have recommended that the National Marine Fisheries Service consider implementing maximum breaking strength ropes of 1700 lbs or less wherever feasible. Further, in areas where the use of this reduced strength rope is not feasible, we recommend the use of rope-less fishing techniques (technically feasible and used in other fisheries outside the US) or another fishing method which through research is shown as an effective deterrent.

The Gulf of Maine is one of the most heavily fished regions of the world. Because of long term photo-identification studies of both right whales and humpback whales along the eastern U.S. and Canadian seaboard, we have been able to carefully document the high frequency of entanglement interaction in both species. Our analyses also show that non-lethal entanglements seriously impact right whale health and reproduction, increasing the likelihood of mortality and reducing calf production. Entanglements in fishing gear remain a huge impediment to the recovery of this species, and are not sustainable for right whales at current levels and trends.

We believe there is a way forward to address this challenging problem and still enable the lobster fishing industry to fish effectively. If the lobster fishing industry began using fishing techniques supported by scientific evidence that showed their efficacy in reducing severe entanglement risk, these modifications could lead to a greatly reduced impact of lobster fishing on large whales and potentially leatherback sea turtles, and would move the fishery towards more sustainability. However, any fishery that has a

significant and negative impact on the most endangered whale species in the world should not be considered sustainable under MSC definitions.

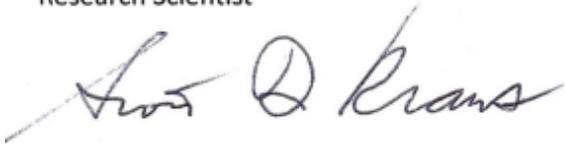
We hope you will consider these impacts as you evaluate certification of this fishery.

Sincerely,



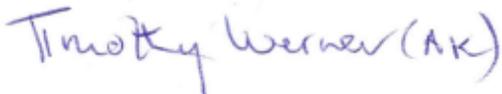
Amy R. Knowlton

Research Scientist



Scott D. Kraus

Vice President of Research



Timothy Werner

Senior Research Scientist

Assessment team's response



August 26, 2016

Amy R. Knowlton, Research Scientist
Scott D. Kraus, Vice President of Research
Timothy Werner, Senior Research Scientist
New England Aquarium
Central Wharf
Boston, Massachusetts

Re: New England Aquarium. Submission regarding the MSC full assessment of the Gulf of Maine Lobster fishery

Dear Amy, Scott, Timothy,

The assessment team appointed to conduct the MSC full assessment of the Gulf of Maine Lobster Fishery has reviewed your submission and discussed the concerns you have raised in relation to the impacts on large whales and the leatherback turtle. We do take your concerns seriously and would like to make the following responses.

We are writing to express our deep concern regarding the proposed MSC certification of the Gulf of Maine lobster fishery. Our concerns have to do with the high levels of bycatch of the critically endangered North Atlantic right whale population as well as other large whale species, and the leatherback sea turtle (also an endangered species). Entanglements in fixed fishing gear, including Gulf of Maine lobster gear, have been well documented for right whales (Knowlton et al 2012). Our study showed that 83% of the population (626 individual whales assessed) has been entangled, with many animals getting entangled repeatedly over their lifetime. The annual rate of entanglement in fishing gear for this species ranges between 15-25%. Worse, entanglements that result in serious injury and mortality have increased significantly over our 30-year study (1980-2009; Knowlton et al. 2012 – see attached). We believe one explanation for this increase in serious entanglements is a technological advance in the mid-1990's that led to the co-extrusion of plastic resins to create stronger fibers and, in turn, stronger ropes. We analyzed the breaking strength of ropes retrieved from large whales, and found it strongly correlated with species size and age – younger and smaller animals are found only in lower breaking strength ropes, whereas adult right whales are found only in the stronger ropes. This finding suggests that younger and smaller whales are unable to break free from stronger ropes and drown. Based on these results, we have recommended that the National Marine Fisheries Service consider implementing maximum breaking strength ropes of 1700 lbs or less wherever feasible. Further, in areas where the use of this reduced strength rope is not feasible, we recommend the use of rope-less fishing techniques (technically feasible and used in other fisheries outside the US) or another fishing method which through research is shown as an effective deterrent.

The Gulf of Maine is one of the most heavily fished regions of the world. Because of long term photo-identification studies of both right whales and humpback whales along the eastern U.S. and Canadian seaboard, we have been able to carefully document the high frequency of entanglement interaction in both species. Our analyses also show that non-lethal entanglements seriously impact right whale health and reproduction, increasing the likelihood of mortality and reducing calf production. Entanglements in fishing gear remain a huge impediment to the recovery of this species, and are not sustainable for right whales at current levels and trends.

Assessment team's response

The assessment team strived to provide a detailed review of the impacts of the Gulf of Maine fishery on ETP large whales and sea turtles, this review is presented in the section 4.4.3 of the Public Comment Draft Report (PCDR).

The assessment team has no doubt that U.S. lobster fisheries including the Gulf of Maine lobster fishery pose a significant risk to endangered large whales. The 2014 Biological Opinion (NMFS 2014) concludes that US lobster fisheries has the potential to seriously injured or kill an average of 3.25 and 9.05 right whales and humpback whales, respectively.

However, for the purpose of the assessment, the assessment team believes that the key question is “does the fishery pose a risk of serious or irreversible harm to large whales and does the fishery hinder the recovery of large whales”.

The most recent marine mammals stock assessment report (Waring et al 2015) indicates that the level of serious injuries and mortalities of Gulf of Maine humpback whales attributable to U.S. commercial fisheries meets the level necessary to allow for growth to the optimum sustainable population level. According to this stock assessment report, the right whale shows a positive and slowly accelerating trend in the population size. Similarly, the Gulf of Maine humpback whale population is characterized by a positive trend.

Furthermore, NFMS 2014 biological opinion concludes that fishery interactions are not threatening the continued survival and recovery of the right whale and the humpback whale (p.146, 150, 161). Based on this evidence the assessment team concluded that the Gulf of Maine lobster does not pose a risk of irreversible harm to right and humpback whales and does not hinder their recovery.

The revised recovery plan for right whale and the recovery plan for humpback whales states that the most significant need for right whale recovery is to reduce or eliminate deaths and injuries from anthropogenic activities, including from commercial fishing operations. The Gulf of Maine lobster fishery is complying with the requirements to reduce the take of whales. The ALWTRP was implemented in 1997 and measures implemented evolve to modify fishing operations/practices to reduce the risk of entanglements.

The assessment team considers that the effects of the GoM lobster fishery on the green turtle, the leatherback turtle and the loggerhead turtle are highly likely to be within the national limits requirements. From 2002 to 2011, NMFS received 159 reports of sea turtles entangled in vertical lines from Maine to Virginia, with 147 events confirmed. Of the 147 confirmed events during this period, 133 events involved leatherbacks, 13 involved loggerheads, and 1 involved a green sea turtle. NMFS identified the gear type and fishery for 93 of the 147 confirmed events which included lobster in 51 events.

NMFS anticipates that the continued operation of lobster fisheries in the whole Atlantic US may result in the incidental take of sea turtles as follows:

- For loggerhead turtles, the annual take of up to one individual, which may be lethal or non-lethal;
- For leatherback turtles, the annual observed take of up to four individual, which may be lethal or non-lethal.

While sea turtle bycatch varies depending on the fishery, of all commercial fisheries operating along the east coast of the U.S., the Southeast shrimp trawl fishery affects more sea turtles than all other activities combined.

The assessment team determined that direct effect are highly unlikely to create unacceptable impacts to green turtle, loggerhead, and leatherback.

Although recovery plan did not lead to any formal implementation of specific actions to reduce interactions and mortality to leatherback turtle, the ALWTRP also benefits to sea turtles.

We believe there is a way forward to address this challenging problem and still enable the lobster fishing industry to fish effectively. If the lobster fishing industry began using fishing techniques supported by scientific evidence that showed their efficacy in reducing severe entanglement risk, these modifications could lead to a greatly reduced impact of lobster fishing on large whales and potentially leatherback sea turtles, and would move the fishery towards more sustainability. However, any fishery that has a significant and negative impact on the most endangered whale species in the world should not be considered sustainable under MSC definitions.

Assessment team's response

Although the assessment team acknowledges that some aspects could be improved, we believe that the ALWTRP is a dynamic and evolving process aiming to reduce the take of large whales by modifying fishing operations/practices through the time.

Based on this evidence the assessment team concluded that the Gulf of Maine lobster does not pose a risk of irreversible harm to right and humpback whales and does not hinder their recovery, and determined that direct effects are highly unlikely to create unacceptable impacts to green turtle, loggerhead, and leatherback.

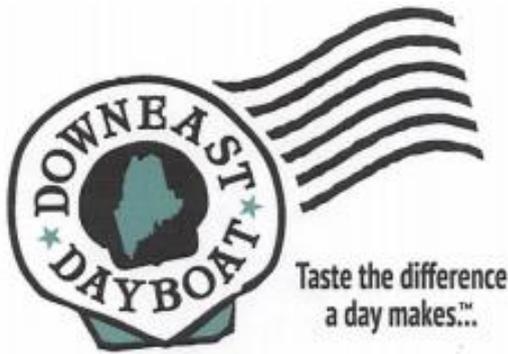
We hope that these responses have dealt with the comments and concerns as outlined in your letter.

Thank you, one again, for having taken the time to communicate with the assessment on this matter.

Yours Sincerely,



Géraldine Criquet
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September 27, 2016
Ms. Jean Ragg
SAI Global
Jean.Ragg@SAIGlobal.com

Dear Ms. Ragg:

I am concerned by the lack of a substantive Action Plan in the Public Draft Report for the Gulf of Maine Lobster Fishery.

I was under the impression that MSC Standards required Clients to describe how they would achieve milestones. In this case no such description is given. There are six unique conditions but the "Action Plan" for each is the identical statement "*Examples of actions may include: Client engaging with management agencies to discuss option to fulfill this condition; and, Client actively working to achieve the milestones as described more fully below.*" In each case, this statement is followed by an exact duplication of the milestones given by the CAB for the particular Condition.

So the Client is effectively saying they will achieve the milestones by achieving the milestones, either by "actively working" themselves or by "engaging with management agencies".

In my role at the Fund for the Advancement of Sustainable Maine Lobster, I developed an Action Plan to meet three of the Conditions listed in the current report. I believe these and the other Conditions are achievable, but only if the Client is willing to invest a significant amount of effort to achieve them. In the interest of fairness, I would hope the CAB's would require both Client groups to clearly describe how they plan to make progress toward and achieve the Conditions. I am concerned that SAI Global appears poised to just accept the Client's word that progress will be made. I hope this is an oversight, and look forward to seeing an actual Action Plan in the Final Report.

Yours truly,


Togue Brawn

DOWNEAST DAYBOAT 48 UNION WHARF BOX 3 PORTLAND, ME 04101 207-838-1490
WWW.DOWNEASTDAYBOAT.COM

Assessment team's response



November 9, 2016

Togue Brawn
Downest Dayboat
48 union Wharf Box3
Portland, Maine

Re: Your submission regarding the MSC full assessment of the Gulf of Maine Lobster Fishery

Dear Togue,

The assessment team appointed to conduct the MSC full assessment of the Gulf of Maine Lobster Fishery has reviewed your submission and discussed the concerns you have raised in relation to the client action plan. We do take your concerns seriously and would like to make the following responses.

I am concerned by the lack of a substantive Action Plan in the Public Draft Report for the Gulf of Maine Lobster Fishery.

I was under the impression that MSC Standards required Clients to describe how they would achieve milestones. In this case no such description is given. There are six unique conditions but the "Action Plan" for each is the identical statement *"Examples of actions may include: Client engaging with management agencies to discuss option to fulfill this condition; and, Client actively working to achieve the milestones as described more fully below."* In each case, this statement is followed by an exact duplication of the milestones given by the CAB for the particular Condition.

So the Client is effectively saying they will achieve the milestones by achieving the milestones, either by "actively working" themselves or by "engaging with management agencies".

Assessment team's response

As per MSC CR 27.11.2, the client action plan shall include: How the conditions and milestones will be addressed, who will address the conditions, the specified time period within the conditions and milestones will be addressed and how the action(s) is expected to improve the performance of the fishery.

As per MSC G2711.2, the fishery client may develop their own corrective actions and deal with the condition in their own way. The important points for the CAB are that the client must demonstrate to the CAB's satisfaction that a condition can be met, and how the outcome or results will be achieved. The client chose to focus the actions on engaging with management agencies and working to promote the development and adoption of harvest control rules; a method to provide sufficient and appropriate bycatch data; a partial strategy to minimize habitat impacts if needed; long-term objectives and specific-fishery objectives; and an up-to-date research plan.

The assessment team is satisfied that all the conditions can be met and how the client decided to address the conditions and milestones are consistent with procedures. The time period is specified

and actions are specifically described for each milestone. In addition, the client engaged to provide documentary evidence regarding the actions that will be done at each milestone.

In my role at the Fund for the Advancement of Sustainable Maine Lobster, I developed an Action Plan to meet three of the Conditions listed in the current report. I believe these and the other Conditions are achievable, but only if the Client is willing to invest a significant amount of effort to achieve them. In the interest of fairness, I would hope the CAB's would require both Client groups to clearly describe how they plan to make progress toward and achieve the Conditions. I am concerned that SAI Global appears poised to just accept the Client's word that progress will be made. I hope this is an oversight, and look forward to seeing an actual Action Plan in the Final Report.

Assessment team's response

Extensive dialogue has been held with our client during the submission of the client action plan. This dialogue and correspondence were specifically intended to ensure the agreed milestones will be progressed via the activities and actions described. Additionally as you aware, MSC procedures requires annual surveillance audit to monitor progress against milestones. Therefore, there will be annual measurement of the client's intentions and progress. Acceptance of a client's word is immaterial in a MSC certification since progress will be based on documentary evidence at meeting milestones and this will be publically available on the MSC website.

We hope that these responses has dealt with the concerns as outlined in your letter.

Thank you, one again, for having taken the time to communicate with the assessment team on this matter.

Yours Sincerely,



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Appendix 4. Surveillance Frequency

The determination of the surveillance level is based on Table C3 and C4. The score was calculated by adding scores from sections 1-4 in table C3.

Table C3: Criteria to determine surveillance score

1. Default Assessment tree used?	
Yes	0
No	2
2. Number of conditions	
Zero conditions	0
Between 1-5 conditions	1
More than 5	2
3. Principle Level Scores	
≥85	0
<85	2
4. Conditions on outcome PIs?	
Yes	2
No	0

The surveillance score of **4** was used to identify the surveillance level appropriate to the Gulf of Maine Lobster lobster trap fishery.

Table C4: Surveillance Level Years after certification or recertification

Surveillance score (from Table C3)	Surveillance level	Year 1	Year 2	Year 3	Year 4
2 or more	Normal Surveillance	On-site surveillance audit	On-site surveillance audit	On-site surveillance audit	On-site surveillance audit & recertification site visit

Appendix 5. Client Agreement (REQUIRED FOR PCR)

Appendix 5.1 Objections Process (REQUIRED FOR THE PCR IN ASSESSMENTS WHERE AN OBJECTION WAS RAISED AND ACCEPTED BY AN INDEPENDENT ADJUDICATOR)