Annual Report under Section 101(a((5)(A) of the MMPA for Fisheries and Ecosystem Research Activities Conducted by the Northeast Fisheries Science Center during September 09, 2016 – December 31, 2017

On September 09, 2016, the Northeast Fisheries Science Center (NEFSC) received Letters of Authorization (LOA) under section 101(a)(5)(A) of the Marine Mammal Protection Act (MMPA; 16 U.S.C 1371(a)(5)) to take marine mammals incidental to fishery and ecosystem research activities in the Atlantic Coast Region (ACR). Take of marine mammals incidental to NEFSC fishery and ecosystem research activities are subject to the provisions of the MMPA and the regulations governing this take as described in 50 CFR Part 219, Subpart D (ACR). These authorizations are valid through September 09, 2021.

In accordance with these authorizations, the NEFSC is required to provide annual reports. The following report will cover the period from September 09, 2016 – December 31, 2017.

The report will be organized into the following sections:

I. Overview of NEFSC's required mitigation measures
II. Line-kilometers surveyed during which EK60, ME70, DSM300 were predominant & pro-rated estimates of actual Level B acoustic take
III. Information regarding use of all sampling gear
IV. Accounts of all incidents of marine mammal interactions including Pinniped Haul out Census during Penobscot Bay Acoustic Survey
V. Evaluation of effectiveness of NEFSC mitigation strategies
VI. Final outcome of serious injury determinations
VII. Training provided to NEFSC staff

I. Overview of NEFSC's required mitigation measures

With the issuance of the NEFSC's MMPA LOA's a set of prescribed mitigation measures were outlined for the Center to follow on all surveys in order to attempt to minimize the likelihood or severity of incidental gear interactions with marine mammals and other protected species. These measures vary slightly depending on the gear type and survey but are mainly comprised of dedicated marine mammal / protected species watches, an associated exclusion zone and move-on rule if protected species are seen during watch, and standard operating procedures by gear type.

Below are gear specific descriptions of these conservation measures.

Trawl Survey protocols:

(i) NEFSC shall conduct trawl operations as soon as is practicable upon arrival at the sampling station.

(ii) NEFSC shall initiate marine mammal watches (visual observation) prior to sampling. Marine mammal watches shall be conducted by scanning the surrounding waters with the naked eye and binoculars (or monocular). During nighttime operations, visual observation shall be conducted using the naked eye and available vessel lighting.

(iii) NEFSC shall implement the move-on rule if a marine mammal is sighted around the vessel before setting the gear. NEFSC may decide to move the vessel away from the marine mammal to a different section of the sampling area if the animal appears to be at risk of interaction with the gear. If, after moving on, marine mammals are still visible from the vessel, NEFSC may decide to move again or to skip the station. NEFSC may use best professional judgment in making this decision.

(iv) NEFSC shall maintain visual monitoring effort during the entire period of time that trawl gear is in the water (i.e., throughout gear deployment, fishing, and retrieval). If marine mammals are sighted before the gear is fully removed from the water, NEFSC shall take the most appropriate action to avoid marine mammal interaction. NEFSC may use best professional judgment in making this decision.

(v) If trawling operations have been suspended because of the presence of marine mammals, NEFSC may resume trawl operations when practicable only when the animals are believed to have departed the area. NEFSC may use best professional judgment in making this determination.

(vi) NEFSC shall implement standard survey protocols to minimize potential for marine mammal interactions. These may include maximum tow durations at target depth and maximum tow distance, cleaning of nets prior to deployment, and careful emptying of the trawl as quickly as possible upon retrieval.

Dredge Survey Protocols:

(i) NEFSC shall deploy dredge gear as soon as is practicable upon arrival at the sampling station.

(ii) NEFSC shall initiate marine mammal watches (visual observation) prior to sampling. Marine mammal watches shall be conducted by scanning the surrounding waters with the naked eye and binocular s (or monocular). During nighttime operations, visual observation shall be conducted using the naked eye and available vessel lighting.

(iii) NEFSC shall implement the move-on rule. If marine mammals are sighted around the vessel before setting the gear, NEFSC may decide to move the vessel away from the marine mammal to a different section of the sampling area if the animal appears to be at risk of interaction with the gear. If after moving on, marine mammals are still visible from the vessel, NEFSC may decide to move again or to skip the station. NEFSC may use best professional judgment in making this decision but may not elect to conduct dredge survey activity when animals remain near the vessel.

(iv) NEFSC shall maintain visual monitoring effort during the entire period of time that dredge gear is in the water (i.e., throughout gear deployment, fishing, and retrieval). If marine mammals are sighted before the gear is fully removed from the water, NEFSC shall take the most appropriate action to avoid marine mammal interaction. NEFSC may use best professional judgment in making this decision.

(v) If dredging operations have been suspended because of the presence of marine mammals, NEFSC may resume operations when practicable only when the animals are believed to have departed the area. NEFSC may use best professional judgment in making this determination.

(vi) NEFSC shall carefully empty the dredge gear as quickly as possible upon retrieval to determine if marine mammals are present in the gear.

Longline Survey Protocols:

(i) NEFSC shall deploy longline gear as soon as is practicable upon arrival at the sampling station.

(ii) NEFSC shall initiate marine mammal watches (visual observation) no less than 30 minutes prior to both deployment and retrieval of the longline gear. Marine mammal watches shall be conducted by scanning the surrounding waters with the naked eye and binoculars (or monocular). During nighttime operations, visual observation shall be conducted using the naked eye and available vessel lighting.

(iii) NEFSC shall implement the move-on rule. If marine mammals are sighted near the vessel within the 30 minutes before setting the gear, NEFSC may decide to move the vessel away from the marine mammal to a different section of the sampling area if the animal appears to be at risk of interaction with the gear. If, after moving on, marine mammals are still visible from the vessel, NEFSC may decide to move again

or to skip the station. NEFSC may use best professional judgment in making this decision but may not elect to conduct longline survey activity when animals remain near the vessel.

(iv) For the Apex Predators Bottom Longline Coastal Shark Survey, if one or more marine mammals are observed within 1 nm of the planned location in the 30 minutes before gear deployment, NEFSC shall transit to a different section of the sampling area to maintain a minimum set distance of 1 nm from the observed marine mammals. If, after moving on, marine mammals remain within 1 nm, NEFSC may decide to move again or to skip the station. NEFSC may use best professional judgment in making this decision but may not elect to conduct pelagic longline survey activity when animals remain within the 1-nm zone.

(v) NEFSC shall maintain visual monitoring effort during the entire period of gear deployment or retrieval. If marine mammals are sighted before the gear is fully deployed or retrieved, NEFSC shall take the most appropriate action to avoid marine mammal interaction. NEFSC may use best professional judgment in making this decision.

(vi) If deployment or retrieval operations have been suspended because of the presence of marine mammals, NEFSC may resume such operations after there are no sightings of marine mammals for at least 15 minutes within the area or within the 1-nm area for the Apex Predators Bottom Longline Coastal Shark Survey. NEFSC may use best professional judgment in making this decision.

(vii) NEFSC shall implement standard survey protocols, including maximum soak durations and a prohibition on chumming.

Gillnet Survey Protocols:

(i) NEFSC shall deploy gillnet gear as soon as is practicable upon arrival at the sampling station.

(ii) NEFSC shall initiate marine mammal watches (visual observation) prior to both deployment and retrieval of the gillnet gear. When the vessel is on station during the soak, marine mammal watches shall be conducted during the soak by scanning the surrounding waters with the naked eye and binoculars (or monocular).

(iii) NEFSC shall implement the move-on rule. If marine mammals are sighted near the vessel before setting the gear, the NEFSC and/or its cooperating institutions, contracted vessels, or commercially-hired captains, as appropriate may decide to move the vessel away from the ma1ine mammal to a different section of the sampling area if the animal appears to be at risk of interaction with the gear. If after moving on, marine mammals are still visible from the vessel, the NEFSC and/or its cooperating institutions, contracted vessels, or commercially-hired captains may decide to move again or to skip the station. NEFSC and/or its cooperating institutions , contracted vessels, or commercially-hired captains may use best professional judgment in making this decision but may not elect to conduct the gillnet survey activity when animals remain near the vessel.

(iv) If marine mammals are sighted near the vessel during the soak and are determined to be at risk of interacting with the gear, then NEFSC shall carefully retrieve the gear as quickly as possible. NEFSC and/or its cooperating institutions, contracted vessels, or commercially-hired captains may use best professional judgment in making this decision.

(v) NEFSC shall implement standard survey protocols, including continuously monitoring the gillnet gear during soak time and removing debris with each pass as the net is reset into the water to minimize bycatch.

(vi) NEFSC shall maintain visual monitoring effort during the entire period of gear deployment or retrieval. If marine mammals are sighted before the gear is fully deployed or retrieved, the NEFSC shall take the most appropriate action to avoid marine mammal interaction. NEFSC may use best professional judgment in making this decision.

(vii) NEFSC shall ensure that surveys deploy acoustic deterrent devices on gillnets in areas where required for commercial fisheries. NEFSC must ensure that the devices are operating properly before deploying the net.

(viii) NEFSC shall ensure that its cooperating institutions, contracted vessels, or co1mnercially-hired captains conducting gillnet surveys adhere to monitoring and mitigation requirements and shall include required protocols in all survey instructions, contracts, and agreements.

(ix) For the COASTSPAN gillnet surveys, NEFSC shall actively monitor for potential bottlenose dolphin entanglements by hand-checking the gill net every 20 minutes. In the unexpected case of a bottlenose dolphin entanglement, NEFSC shall request and a1Tange for expedited genetic sampling for stock determination. NEFSC shall also photograph the dorsal fin and submit the image to the NMFS Southeast Stranding Coordinator for identification/matching to bottlenose dolphins in the Mid-Atlantic Bottlenose Dolphin Photo-Identification Catalog.

Pot/trap Survey Protocols:

(i) NEFSC shall deploy pot/trap gear as soon as is practicable upon arrival at the sampling station.

(ii) NEFSC shall initiate marine mammal watches (visual observation) no less than 30 minutes prior to both deployment and retrieval of the pot/trap gear. Marine mammal watches shall be conducted by scanning the su1Tounding waters with the naked eye and binoculars (or monocular). During nighttime operations, visual observation shall be conducted using the naked eye and available vessel lighting.

(iii) NEFSC shall implement the move-on rule. If marine mammals are sighted near the vessel before setting the gear, NEFSC, as appropriate, may decide to move the vessel away from the marine mammal to a different section of the sampling area if

the animal appears to be at risk of interaction with the gear. If after moving on, marine mammals are still visible from the vessel, NEFSC may decide to move again or to skip the station. NEFSC may use best professional judgment in making this decision but may not elect to conduct the pot and trap activity when animals remain near the vessel.

(iv) If marine mammals are sighted near the vessel during the soak and are determined to be at risk of interacting with the gear, then NEFSC shall carefully retrieve the gear as quickly as possible. NEFSC may use best professional judgment in making this decision.

(v) NEFSC shall ensure that surveys deploy gear fulfilling all pot/trap universal commercial gear configurations such as weak link requirements and marking requirements as specified by applicable take reduction plans as required for commercial pot/trap fisheries.

(vi) NEFSC shall ensure that its cooperating institutions, contracted vessels, or commercially-hired captains conducting pot/trap surveys adhere to monitoring and mitigation requirements and shall include required protocols in all survey instructions, contracts, and agreements.

Fyke Net Gear Protocols:

(i) NEFSC shall conduct fyke net gear deployment as soon as is practicable upon arrival at the sampling station.

(ii) NEFSC shall visually survey the area prior to both deployment and retrieval of the fyke net gear. NEFSC shall conduct monitoring and retrieval of the gear every 12- to 24-hour soak period.

(iii) If marine mammals are in close proximity (approximately 100 m) of the setting location, NEFSC shall determine if the set location should be moved. NEFSC may use best professional judgment in making this decision.

(iv) If marine mammals are observed to interact with the gear during the setting, NEFSC shall lift and remove the gear from the water.

(v) NEFSC must install and use a marine mammal excluder device at all times when the 2-m fyke net is used.

Beach Seine Gear Protocols:

(i) NEFSC shall conduct beach seine deployment as soon as is practicable upon arrival at the sampling station.

(ii) NEFSC shall visually survey the area prior to both deployment and retrieval of the

seine net gear.

(iii) If marine mammals are in close proximity of the seining location, NEFSC shall lift the net and remove it from the water. NEFSC may use best professional judgment in making this decision.

Rotary Screw Trap Gear protocols:

(i) NEFSC shall conduct rotary screw trap deployment as soon as is practicable upon arrival at the sampling station.

(ii) NEFSC shall visually survey the area prior to both setting and retrieval of the rotary screw trap gear. If marine mammals are observed in the sampling area, NEFSC shall suspend or delay the sampling. NEFSC may use best professional judgment in making this decision.

(iii) NEFSC shall tend to the trap on a daily basis to monitor for marine mammal interactions with the gear.

(iv) If the rotary screw trap captures a marine mammal, NEFSC shall carefully release the animal as soon as possible.

II: Line-kilometers surveyed during which EK60, ME70, DSM300 (Raytheon C120) were predominant & pro-rated estimates of actual Level B acoustic take

Table 1. Total line-kilometers (kms) surveyed during the reporting period (Sept 2016 – Dec 2017) for which the EK60, ME70, and C120 echosounder was predominant acoustic source in the LME compared to the totals calculated in the NEFSC's MMPA LOA application (Appendix D of NEFSC's National Environmental Policy Act Programmatic Environmental Assessment).

NEFSC Large Marine Ecosystem				
Echosounder	EA Estimated summed dominant line-kms/source (0-200m)	Summed line-kms of reporting period / source (0-200m)	EA Estimated summed dominant line-kms/source (>200m)	Summed line-kms of reporting period / source (>200m)
C120	16,927	11,421	NA	NA
EK60	36,697	22,355	NA	NA
ME70	14,000	7,017	NA	NA

Table. 2 Total line-kilometers (kms) surveyed during the reporting period (Sept 2016 – Dec 2017) for which the EK60 or ME70 echosounder was predominant acoustic source in the NEFWSC Offshore area compared to the totals calculated in the NEFSC's MMPA LOA

application (Appendix D of NEFSC's National Environmental Policy Act Programmatic Environmental Assessment).

NEFSC Offshore Area				
Echosounder	EA Estimated summed dominant line-kms/source (0-200m)	Summed line-kms of reporting period / source (0-200m)	EA Estimated summed dominant line-kms/source (>200m)	Summed line-kms of reporting period / source (>200m)
EK60	3,666	NA	8,816	1,913
ME70	5,150	NA	0	0

III: Information regarding use of all sampling gear

Table 3. NEFSC trawl deployments by project for reporting period of September 2016 – December 31, 2017. Durations are in minutes.

Trawl Project	Trawl Gear Type	#Trawls	Depth Range (m)	Duration
Fall Bottom Trawl Survey - 2016	4 seam 3 bridle rock hopper	234	10 – 400	20
Fall Bottom Trawl Survey Gear Trials - 2016	4 seam 3 bridle rock hopper	53	10 – 400	20
Spring Bottom Trawl Survey - 2017	4 seam 3 bridle rock hopper	319	10 – 400	20
Fall Bottom Trawl Survey - 2017	4 seam 3 bridle rock hopper	58	10 – 400	20
Fall State of Mass Inshore Survey - 2016	2 seam rockhopper	96	5 – 50	30
Spring State of Mass Inshore Survey - 2017	2 seam rockhopper	105	5 – 50	30
Fall State of Mass Inshore Survey - 2017	2 seam rockhopper	99	5 – 50	30
Northern Shrimp Trawl GOM survey	4 seam shrimp	69	50 – 400	20
Fall NEAMAP Inshore Survey - 2016	4 seam 3 bridle cookie sweep	150	5 - 50	20
Spring NEAMAP Inshore Survey - 2017	4 seam 3 bridle cookie sweep	150	5 - 50	20
Fall NEAMAP Inshore Survey - 2017	4 seam 3 bridle cookie sweep	150	5 - 50	20
Maine Mid-water Trawl survey	2 seam Mid-Water Trawl	59	2 - 10	10
Spring ME/NH Inshore Trawl Survey	4 seam Shrimp rock hopper	123	5 – 200	20
Spring ME/NH Inshore Trawl Survey	4 seam Shrimp rock hopper	101	5 – 200	20
NEFSC Sweep Study	4 seam trawls chain/rockhopper	184	30 – 50	20
NEFSC TEDS Study with Squid and Flounder	2 Seam trawl rigged with TED	174	30 – 50	60
NEFSC Squid Survey	Beam trawl	34	30 - 50	30
GOM Sea Pen Survey	Beam trawl	10	30 - 50	30

Table 4. NEFSC dredge deployments by project for reporting period of September 2016 – December 31, 2017. Dredge haul durations in minutes.

Dredges	Trawl Gear Type	#Dredge hauls	Depth Range (m)	Duration
Surf Clam and Ocean Quahog	COMM. CLAM DREDGE 13'	0	10 – 100	5
Sea Scallop Survey	8 ' scallop dredge	120	10 – 100	15
Scallop Grant Programs ()	8' and 15' dredges	1978	10 - 150	15/30

Table 5. NEFSC long line deployments by project for reporting period from September 2016 – December 31, 2017. Long line soak times in hours.

Long Line Gear	Sets	Length of set (nm)	Soak Time (hours)
Spring 2017 GOM Longline Survey	45	1	2
Fall 2017 GOM Longline Survey	45	1	2
Apex Predator Survey	0	0	0
COASTSPAN	unavailable	NA	NA

Table 6. NEFSC gill net deployments by project for reporting period from September 2016 – December 31, 2017. Gill net soak times in hours.

Gill Net Gear	Sets	Length of set (nm)	Soak Time (hours)
COASTSPAN	unavailable	NA	NA

Table 7. NEFSC fyke net, beach seine, pot/trap, rotary screw traps deployments by project for reporting period from September 9, 2016 – December 31, 2017.

Gear	Effort
Fyke Net	none
Beach Seine	none
Rotary Screw Trap	none

IV: Accounts of all incidents of marine mammal interactions

Level A interactions in NEFSC LME

During the reporting period, the NEFSC had no Level A interaction events with marine mammals reported.

Table 8. NEFSC's annual Level B harassment by acoustic sources by sound type for each marine mammal species in the LME. For each species and predominant source, the cross sectional area for the relevant depth strata (Table 6.5 of NEFSC EA appendix D) was multiplied by the actual line-km for each respective strata (Table 1.) and the volumetric density (shown here) to assess Level B harassment for the reporting period.

Common Name	Volumetric density (#/km3)	Typical vertical habitat		NEFSC Reporting Period Acoustic Takes (# of animals)			**Reporting Period Total Takes**	EA Estimated Annual Takes
		0 - 200m	>200m	EK60	ME70	C120		
LME Area Cetaceans								
Atlantic white-sided dolphin	0.122	X		20	55	12	87	144
Cmn. bottlenose dolphin (coastal)	0.5165	X		84	232	52	368	609
Cmn. bottlenose dolphin (offshore)	0.03	X		5	13	3	21	35
Cuvier's beaked whale	0.0105	X		2	5	1	7	12
Dwarf/Pygmy Sperm Whale	0.00004	X		0	0	0	0	10
Harbor Porpoise	0.0965	X		16	43	10	69	114
Long-finned Pilot Whale	0.1725	X		28	78	17	123	203
Mesoplodon beaked whales	0.0105	X		2	5	1	7	12
Risso's dolphin	0.011	X		2	5	1	8	13
Short-beaked common dolphin	1.0575	X		171	475	107	754	1,247
Short-finned Pilot Whale	0.1725	X		28	78	17	123	203
Sperm Whale	0.00005	X		0	0	0	0	10
White-beaked dolphin	0.0405	X		7	18	4	29	48
LME Area Pinnipeds								
Gray Seal	0	X		0	0	0	101	0
Harbor Seal	1.422	X		231	639	144	1,013	1,677

Table 9. NEFSC's annual Level B harassment by acoustic sources by sound type for each marine mammal species in the offshore area. For each species and predominant source, the

cross sectional area for the relevant depth strata (Table 6.5 of NEFSC EA appendix D) was multiplied by the actual line-km for each respective strata (Table 1.) and the volumetric density (shown here) to assess Level B harassment for the reporting period.

Common Name	Volumetric density (#/km3)	Typical vertical habitat		NEFSC Reporting Period Acoustic Takes (# of animals)			**Reporting Period Total Takes**	EA Estimated Annual Takes
		0 - 200m	>200m	EK60	ME70	C120		
Offshore Area Cetaceans								
Atlantic spotted dolphin	0.104		X	3	0	0	3	16
Cmn. bottlenose dolphin (offshore)	0.263		X	7	0	0	7	41
Cuvier's beaked whale	0.0312		X	1	0	0	1	19
Dwarf sperm whale	0.004		X	0	0	0	0	2
Long-finned pilot whale	0.0512		X	1	0	0	1	32
Mesoplodon beaked whales	0.0312		X	1	0	0	1	19
Northern bottlenose whale	0.0034		X	0	0	0	0	2
Pygmy sperm whale	0.004		X	0	0	0	0	2
Risso's dolphin	0.422		X	11	0	0	11	66
Rough toothed dolphin	0.008		X	0	0	0	0	1
Short-beaked common dolphin	0.9375		X	25	0	0	25	146
Short-finned pilot whale	0.0512		X	1	0	0	1	32
Sperm whale	0.0304		X	1	0	0	1	19
Striped dolphin	1.514		X	41	0	0	41	236

Level B Disturbance of Penobscot Bay Pinniped Haul-out Area Survey

As part of the NEFSC Atlantic Salmon Group's Penobscot hydroacoustic transect survey, Avian and Marine Mammal Census (referred as **Penobscot River pinniped haul out census** in LOA) are conducted to document fish predators relative to the fish biomass identified in the acoustics. NEFSC Atlantic Salmon Research Team used 10x50 magnification binoculars to survey both sides of the river and ahead of the boat for birds and mammals, continually scanning as the boat proceeded along the transect line. All bird and marine mammal species in or immediately above the river or using the banks of the river, and their primary (i.e. swimming, flying, and stationary) and secondary (i.e. foraging, resting) behavior were recorded. Time of each observation was recorded to the nearest minute. The observations and time were joined with the waypoint data from the GPS to geospatially assign observations. The width of the estuary allowed for accurate observation from shore to shore for the northern estuary portion but wider sections in the lower estuary were considered a sample count and not a census. The speed of the boat allowed for approximately 200 m to be traveled in one minute, and most birds and marine mammals were observed well within 200 m. Effort was made to avoid counting birds multiple times in the same area by tracking activity as much as practical. The transect design passes by 3 ledges that are potential pinniped haul-outs and these points are observed by binocular from a distance of 300-500 meters.

The NEFSC is tasked with ranking hauled-out pinniped behavior according to the three-point

scale of response severity (1 = alert; 2 = movement; 3 = flight). In general, the haul-out seals remained on the ledge during observation and did not flight to the water as a group. According to the three-point scale of response severity (1 = alert; 2 = movement; 3 = flight), the haul-out observations should be considered level = 1 as it isn't possible to equate movement and flight from the ledge as caused by the vessel or acoustic gear versus normal behaviors. During the 13 hydroacoustics surveys in 2017, 3 species of marine mammal were observed: Harbor seal *Phoca vitulina*, Grey Seal *Halichoerus grypus* and harbor porpoise *Phocoena phocoena*. We observed 242 Harbor seals and 2 grey seals on haul outs.

In addition, 65 harbor seals, 17 grey seals and 1 harbor porpoise were observed swimming. Since these observations were all made while the vessel was under power, the response severity should be conservatively considered = 3. The mammals observed never maintained their position and either swam away or dove assumingly in response to our nearby vessel.

Table 10. Pinniped Haul Out Survey and Response Severity

Species	Count (on haul-out)	Count (in water)	Response (severity score = # of animals)
Harbor seal	242	65	(1) (3)
Grey seal	2	17	(1) (3)
Harbor porpoise	n/a	1	(1) (3)

V: Evaluation of Monitoring and Effectiveness of NEFSC mitigation strategies

An evaluation of the mitigation measures employed by the NEFSC to reduce potential impacts to marine mammals is outlined below for deployed fishing gear types. For detailed mitigation measure descriptions, please see Section 1 of this report. Monitoring, recording of sightings, and indication of decision to move on within a sampling area or skip a sampling location was not instigated for NEFSC programs. Data recorded and presented is anecdotal or derived for 2017. During the 2017 MMPA LOA training, NEFSC did not provide clear guidance for recording the presence of marine mammals that trigger a mitigation measure unless it was an incidental harassment level A take. This will be cleared up for the next annual report. All monitoring was conducted and mitigation measures were taken.

Trawl Survey Marine Mammal Mitigation Strategies

The Northeast Fisheries Science Center and its partners utilizes several different types of bottom and mid-water trawling gear. They range from the 4 seam 3 bridle standardized bottom trawl with rockhopper footrope gear for the seasonal shelf wide bottom trawl survey, an inshore seasonal shelf wide bottom trawl survey with the same gear and an alternate cookie footrope, 2 seam bottom trawls for inshore work for the state of Massachusetts inshore bottom trawl survey, cooperative research work with 2 seam bottom trawl gear for turtle excluder devices (TEDS), 4 seam rockhopper rigged shrimp trawls for Gulf of Maine shrimp survey, paired trawls gear comparison research cruises with the standardized nets rigged with different footgear, 8' wide beam trawls, and small mid-water trawls for Penobscot bay predator/prey surveys. We currently do not separate mitigation and reporting measures

between bottom and mid-water trawling gear. With the dramatic reduction in mid-water trawling activities, the need to separate these gear types for reporting purposes has diminished.

During use of any of these trawl gears, the following mitigation protocols were to be conducted: trawls were conducted as soon as practicable, visual observations (mammal watches) were conducted by Bridge staff during the entire gear deployment, move on rule to within the sampling site or sites skipped if mammals were in the area and not moving out of the site, and maintain standard trawling protocols to minimize marine mammal interactions (short trawls (20 minutes) and cleaning out nets quickly and carefully upon retrieval.

The NEFSC has not yet standardized a method to record mitigation efficiency effects from trawl surveys. The SWFSC has utilized bridge logs to assemble a data base of times the move-on and trawl aborted rule for each trawl survey was initiated in order to assess the loss of survey time (survey efficiency loss due to abiding by marine mammal mitigation measures). The NEFSC will work during 2018 to develop a standard method of recording these data and reporting requirements to the LOA coordinator. Some of our surveys utilize an electronic bridge log that may be able to record these data easily.

The NEAMAP survey responded to this request with 450 trawl deployments (150 per season for fall 2016, spring 2017, and fall 2017) with zero incidents when station efficiency was affected by the presence of marine mammals. They did not have to move trawl locations to locations within the random sampling site or skip sites to move on to another random site for Fall 2016 thru December 2017. This information was based on comments from the PI's in charge of the surveys that are on the bridge during station arrival and gear deployment. Unfortunately, our other programs were not informed to record these interaction notes in a standard manner across programs, so NEFSC is not prepared to report on the effects of mitigation measures on project efficiency.

NEFSC Standardized Trawl Survey: No stations were moved or dropped due to the presence of marine mammals.

Gulf of Maine Shrimp Survey: No stations were moved or dropped due to the presence of marine mammals.

Penobscot Bay Trawl Survey: No stations were moved or dropped due to the presence of marine mammals. This survey made visual observations of marine mammals reacting to the presence of the trawling vessel. Marine mammal observations: 17 Harbor Seal, 3 Grey Seal and 0 harbor porpoise during the deployment, fishing and retrieval of trawl gear. Similar to the assumptions made in the acoustic surveys, all mammal observation were of swimming animals and none retained position during observation.

ME/NH Inshore Trawl Survey: No stations were moved or dropped due to the presence of marine mammals.

TED Research with Trawls: No stations were moved or dropped due to the presence of marine mammals.

Sweep Comparison Cooperative Research: No stations were moved or dropped due to the presence of marine mammals.

Mass Inshore Trawl Survey: No stations were moved or dropped due to the presence of marine mammals.

Dredge Gear Marine Mammal Mitigation Strategies

The NEFSC and its partners utilize several types of dredge gear to conduct surveys and research. The standardized scallop survey uses a lined 8' wide New Bedford style dredge, the RSA Scallop surveys utilize both 8'wide science dredge and 15' wide commercial sized scallop dredge gear, the clam survey uses a commercial sized (13' wide) clam dredge, During use of any of these dredge gears, the following mitigation protocols were to be conducted: dredge hauls were conducted as soon as practicable, visual observations (mammal watches) were conducted by Bridge staff during the entire gear deployment, move on rule to within the sampling site or sites skipped if mammals were in the area and not moving out of the site, and maintain standard dredging protocols to minimize marine mammal interactions (short trawls (15 and 30 for scallop, 5 for clam) and cleaning out dredge gear quickly and carefully upon retrieval.

Sea Scallop Survey: No stations moved or dropped due to the presence of marine mammals.

Surf Clam Dredge Survey: No survey conducted for 2017.

Scallop RSA Dredge Surveys: No stations moved or dropped due the presence of marine mammals for RSA Projects

As stated above, NEFSC has not standardized the collection of the mitigation measures, therefor assessment of the successes to mitigation measures is anecdotal.

Longline Gear Marine Mammal Mitigation Strategies

As stated above, NEFSC has not standardized the collection of marine mammal sightings, triggers for mitigation measures, therefor assessment of the successes to mitigation measures is anecdotal. Data from the COASTSPAN longline surveys will not be available until fall 2018.

Gill Nets

Gill net surveys for shark species are conducted using gill nets in waters off of Georgia, Florida, and South Carolina. The NEFSC Apex Predator group contracts out gill net surveys annually.

As stated above, NEFSC has not standardized the collection of marine mammal sightings and the effect on mitigation measures, therefor assessment of the successes to mitigation measures is anecdotal. Data from the COASTSPAN gill net surveys will not be available until fall

2018.

Pot/Traps, Fyke Nets, Beach Seines, Rotary Screw Traps

The NEFSC did not conduct gill nets, pot/trap, Fyke net, Beach Seines, or rotary screw traps in 2017, so there were no methods to assess for mitigation success and changes for those gear types.

Each PI was provided the LOA that contain the mitigation and monitoring measures for each gear type. From all reports, mitigation monitoring and reporting were followed. These included marine mammal watches before, during, hauling of all gear types.

VI: Final outcome of serious injury determinations

The NEFSC did not have any takes; therefore, there were no serious injury determination from the period of September 9, 2016 – December 31, 2017.

VII: Training provided to NEFSC staff

The NEFSC is required to conduct annual training for all chief scientists and other personnel who may be responsible for implementing mitigation measures, data collection, and reporting requirements. A portion of the training must be dedicated to discussion on the use of best professional judgment to avoid marine mammal interactions to gain an understanding of successful versus unsuccessful decisions.

The first training NEFSC provided to seagoing personnel was conducted on January 30, 2017 and the second session was on February22, 2017, in the winter after receiving final authorizations. Therefore, it was possible to develop an initial training for seagoing staff on the new requirements and start implementation discussions.

Tania Lewandowski (NEFSC Fishery Observer Branch) and Nathan Keith (NEFSC Vessel Coordinator) developed and provided the logistics, *Training on Incidental Take Authorization and Environmental Compliance Process for NEFSC Fisheries and Ecosystem Research* – the training was put on for NEFSC's biological sampling programs in Falmouth Massachusetts. These trainings occurred over one full work day and divisions determined who from seagoing staff would participate – chief scientists relayed all relevant information to those folks who could not make the training.

The training was designed to introduce staff who had not played a major role in acquiring environmental compliance and incidental take authorizations to the process and new regulatory requirements that would have to be implemented on their surveys. Throughout the training two way communication was promoted between staff and presenters to ensure that a thorough and complete understanding or all new requirements was translated.

First, an overview and background were provided to give a general understanding of statutory requirements, NEFSC's incidental take history, and development of the NEFSC's mitigation

measures. After that, the main objective of the training was to introduce 1) the scope (research areas, gear types, authorized take species, etc.) of what the Center's authorizations would cover, and 2) the implementation of the authorization conditions (mitigation measures, reporting requirements, data collection, etc.) for each Incidental Take species group. Included was a portion of the training focused on the circumstances in which professional judgment decisions can be used and what decisions are frequently made when dealing with specific gear types and interactions / avoidance practices with protected species.

The first session of the daily training was titled "Zoonotics and Safe Handling Protocols" by Andrea Bogomolni from Woods Hole Oceanographic. She introduced results on survivorship of marine mammals that were handled carefully and quickly.

The second session was titles "Sea Turtles" and was conducted by Lisa Wilt and Stephanie Petrus from NEFSC. The session included sea turtle identification, resuscitation methods, sampling protocol review, photographing, biopsy protocols, Iconel tagging and pit tagging scanning practice.

The third session was titled "Sea Turtle Disentanglement" by Kate Sampson from GARFO. She instructed the NEFSC on proper disentanglement procedures and reporting. The key message is that we probably should reach out to our GARFO partners that do this kind of operation frequently. Only perform minimal disentanglement when there is no other option for assistance.

The fourth session was Atlantic salmon by Sean Hayes of the NEFSC Protected Species Branch. The session included salmon ID, critical measurements, sampling and scale removal, photographing, resuscitation and pit tagging protocols.

The fifth session was titled "Sturgeon" and was conducted by NEFSC's Ben Church and Chad Keith from Fisheries Sampling Branch and John Galbraith of Ecosystem Surveys Branch. The session included species identification between Atlantic and Short-nosed sturgeon, critical measurements, fin clip protocols, photographing, resuscitation, and pit tagging.

The Sixth session was titled "Marine Mammals and Birds" and was conducted by Lisa Wilt and Stephanie Petrus form Fisheries Sampling Branch.

The marine mammal and sea turtle handling and sampling portion of the trainings were developed in coordination with NEFSC's Marine Mammal and Turtle Division and GARFO. The NEFSC has not had any follow-up meetings since the initial training. This summer (2018), the NEFSC shall conduct a mitigation review meeting to discuss the protocols of recording when sampling locations are moved or dropped due to the presence of marine mammals. There have been several turtle and sturgeon interactions, but all mitigation measures have been followed. It was decided to continue with reporting and not to re-assess mitigation measures at this time.

The NEFSC has not scheduled a training for 2018 as of yet. The new hire for Environmental Compliance was not up to speed with the training process and it was decided to forego training for this cycle. Although, NEFSC recognizes the value of meeting each year to provide updates

to changes in protocols, discuss past mitigation measures, and discuss improvements. The idea is that an annual training session is useful to prepare seagoing staff immediately prior to their field season, and a forum is useful to debrief implementing mitigation, reporting and collecting data during the past season while memories are still fresh. The NEFSC Environmental Compliance Coordinator will make plans to conduct onsite training for new staff at remote sites in 2018. A full training program for new employees and a refresher for trained staff is planned for the winter of 2019. A special mitigation meeting will be held during the training.