UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
Office of Protected Resources

PETITION FOR PROMULGATION OF REGULATIONS AND REQUEST FOR LETTER OF AUTHORIZATION PURSUANT TO SECTION 101 (a) (5) (A) OF THE MARINE MAMMAL PROTECTION ACT

for the

Taking of Marine Mammals Incidental to Fisheries and Ecosystem Research Conducted and Funded by the Alaska Fisheries Science Center and International Pacific Halibut Commission

50 C.F.R. Part 216, Subpart R

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ACRONYMS AND ABBREVIATIONS

~	approximately
%	percent
ADF&G	Alaska Department of Fish and Game
AFSC	Alaska Fisheries Science Center
APSEF	AFSC Protected Species Encounter Form
AUV	Autonomous Underwater Vehicle
BiOp	Biological Opinion
BSAI	Bering Sea/Aleutian Islands
BSAIRA	Bering Sea/Aleutian Islands Research Area
CA	California
Centers	Regional Fisheries Science Centers
CFR	Code of Federal Regulations
CI	Confidence Interval
cm	centimeter
CSBSRA	Chukchi Sea/Beaufort Sea Research Area
CTD	Conductivity, Temperature, and Depth
CV	Coefficient of Variation
D	Depleted under the MMPA
DAS	days at sea
dB	decibels
dB re 1 µPa	decibels relative to 1 microPascal
DON	Department of the Navy
DPS	Distinct Population Segment
E	Endangered under the ESA
EBS	Eastern Bering Sea
EEZ	Exclusive Economic Zone
ENP	Eastern North Pacific
ESA	Endangered Species Act
FAA	Federal Aviation Administration
fm	fathom
FR	Federal Register
ft	feet
GOA	Gulf of Alaska
GOARA	Gulf of Alaska Research Area
GPS	Global Positioning System
hr	hour
Hz	hertz
IPHC	International Pacific Halibut Commission
kg	kilograms
kHz	kilohertz
km	kilometers
km^2	square kilometers
kts	knots
LOA	Letter of Authorization

LOF	List of Fisheries
m	meters
MHHW	mean higher high water
min	minutes
MLLW	mean lower low water
MMPA	Marine Mammal Protection Act
MMVM	Marine Mammal Visual Monitor
M/SI	Mortality/Serious Injury
NL	not listed under the ESA
NS	not strategic under the MMPA
nm	nautical mile
NMFS	National Marine Fisheries Service
MML	National Marine Mammal Laboratory
NOAA	National Oceanic and Atmospheric Administration
NPFMC	North Pacific Fishery Management Council
NRC	National Research Council
N-SEAK	Northern Southeast Alaska
OOD	Officer(s) on Deck
OPR	Office of Protected Resources
OR	Oregon
oz	ounce
PBF	Physical and Biological Feature
PBR	Potential Biological Removal
PEA	Programmatic Environmental Assessment
PSIT	Protected Species Incidental Take
PSO	Protected Species Observer
PTS	Permanent Threshold Shift
rms	root mean square
ROV	Remotely Operated Vehicle
§	Section(s)
S	Strategic under the MMPA
S-SEAK	Southern Southeast Alaska
SRKW	Southern Resident Killer Whales
TSMRI	Ted Stevens Marine Research Institute
TTS	Temporary Threshold Shift
UAS	Uncrewed Aerial Systems
UxS	Uncrewed System
UME	Unusual Mortality Event
U.S.	United States
WA	Washington
WBAT	Wide-band Autonomous Transceiver
Y-SEAK	Yakutat/Southeast Alaska

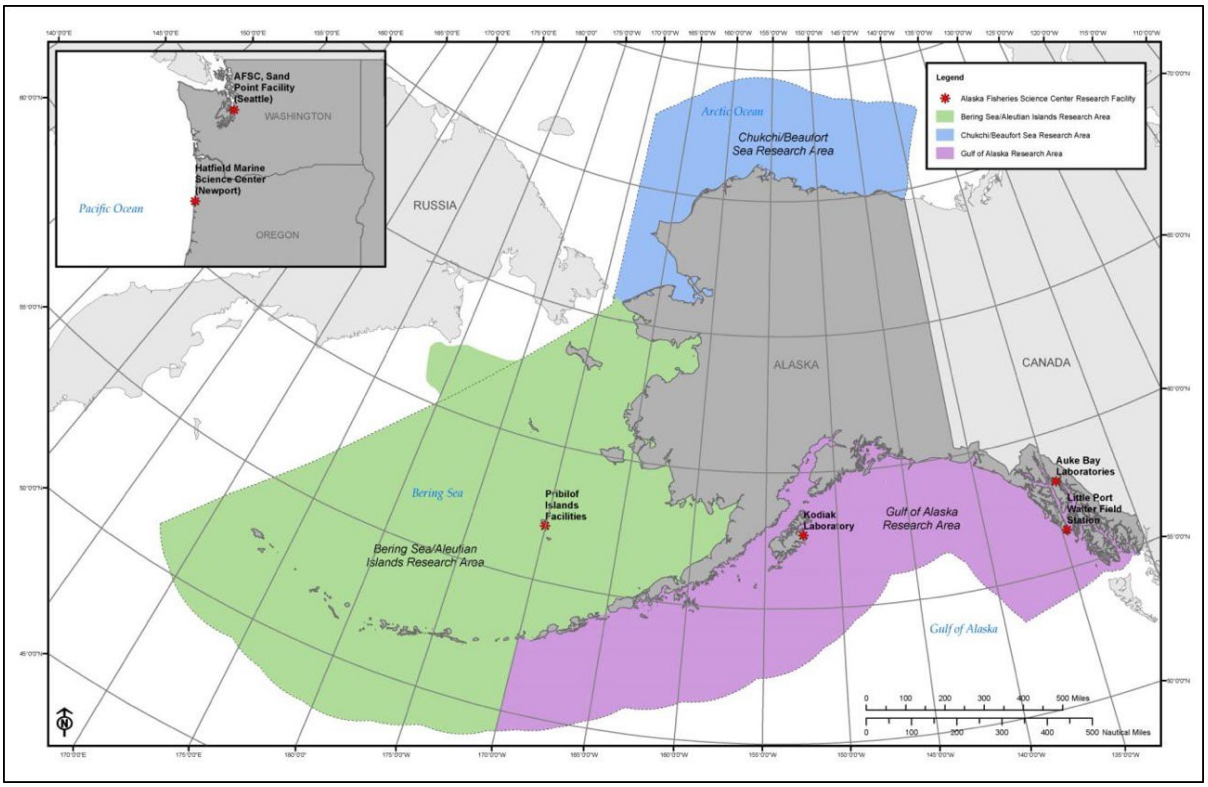
1. DESCRIPTION OF ACTIVITIES

1.1. Nature of Request

The United States (U.S.) government has jurisdiction over the living marine resources in waters of the Exclusive Economic Zone (EEZ), 3 to 200 nautical miles (nm) from the U.S. shoreline. Congress has enacted several statutes authorizing federal agencies to manage and protect living marine resources. The National Oceanic and Atmospheric Administration (NOAA) is responsible for protecting marine finfish and shellfish species and their habitats. Within NOAA, the National Marine Fisheries Service (NMFS) is responsible for conducting science-based management, conservation, and protection of living marine resources.

The headquarters of the Alaska Fisheries Science Center (AFSC) is located at the Sand Point Facility in Seattle. AFSC also includes the Auke Bay Laboratories and Ted Stevens Marine Research Institute at Lena Point, Little Port Walter Field Station, Kodiak Laboratory, Pribilof Islands Facilities, Dutch Harbor Field Office, Anchorage Field Office, and the Hatfield Marine Science Center in Newport, Oregon (Figure 1-1). AFSC is one of six Regional Fisheries Science Centers (Centers) that direct and coordinate the collection of scientific information required for adequate resource protection and fisheries management.

Figure 1-1. AFSC Research Facilities and Research Area Boundaries



Source: NMFS (2019c)

AFSC scientists conduct fishery-independent research using NOAA-owned and operated vessels or chartered vessels. AFSC research occurs primarily in U.S. marine waters of Alaska in three specific research areas: 1) Gulf of Alaska Research Area (GOARA); Bering Sea/Aleutian Islands Research Area (BSAIRA); and Chukchi Sea/Beaufort Sea Research Area (CSBSRA) (see Figure 1-1).

AFSC contributes scientific data for fisheries and marine resource management issues to a variety of domestic management organizations and stakeholder groups, including: NMFS Alaska Regional Office; North Pacific Fishery Management Council (NPFMC), which has jurisdiction for developing fishery recommendations that cover non-treaty fisheries in the EEZ off Alaska; the State of Alaska; Alaskan coastal subsistence communities; U.S. representatives participating in international fishery and marine mammal negotiations; and the commercial fishing industry and its constituents. AFSC also coordinates fisheries and marine mammal research with other federal and state agencies, academic institutions, and foreign nations, and generates and communicates scientific information to support: recovery of protected species; establishment of Marine Protected Areas; marine spatial planning; and understanding the impacts of climate change on marine ecosystems.

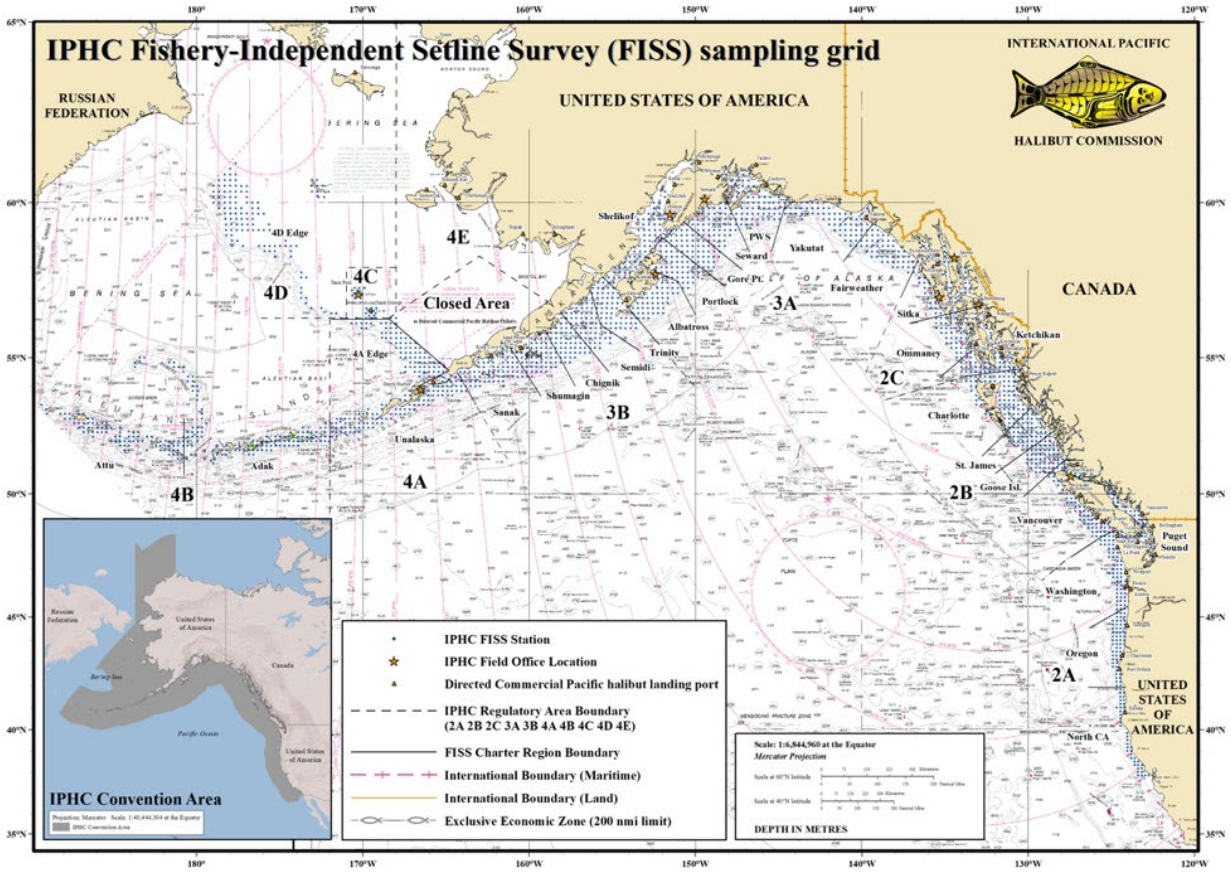
In addition to providing information for domestic fisheries management, AFSC provides scientific advice to support international fisheries councils, commissions, and conventions including: the Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea; the North Pacific Anadromous Fish Commission; the International Whaling Commission (IWC); and the International Pacific Halibut Commission (IPHC). Details regarding these international entities can be found in the 2019 *Final Programmatic Environmental Assessment (PEA) for Fisheries Research Conducted and Funded by the Alaska Fisheries Science Center* (see Section 1.2 for additional information of the PEA) (NMFS 2019c).

Incidental "taking" of marine mammals is defined by the Marine Mammal Protection Act (MMPA) as to "harass, hunt, capture or kill, or attempt to harass, hunt, capture or kill" marine mammals. Under Section 101(a)(5)(A) of the MMPA, NMFS may promulgate regulations and issue Letters of Authorization (LOAs) for multi-year activities. Thus, the purpose of this request by AFSC is for NMFS Office of Protected Resources (OPR) to develop regulations and issue annual LOAs over the 5-year period, effective October 9, 2024 through October 9, 2029, allowing for the potential incidental taking of small numbers of marine mammals during fisheries and ecosystem research in the areas shown in Figure 1-1. As described in Section 5, only takes related to non-lethal injury, mortality/serious injury (M/SI) and physical disturbance are requested in this application.

1.2. Definition of Action Area

NMFS defines the outer boundary of an action area for a project as the point where no detectable or measurable effects from AFSC and IPHC fisheries research would occur. As shown in Figure 1-1, AFSC conducts research in three areas in waters of the U.S. off of Alaska: GOARA; BSAIRA; and CSBSRA. In addition, Figure 1-2 shows IPHC research areas. Only a subset of IPHC stations shown in the figure are surveyed each year. The decision regarding which to sample in subsequent years is made in the fall of each year. As defined, the action area is large; however, research would occur only in small portions of this total area.

Figure 1-2. IPHC Research Areas



Source: NMFS (2019c)

1.3. Proposed Action

AFSC proposes to continue fisheries research activities throughout the GOARA, BSAIRA, and CSBSRA to produce scientific information necessary for the management and conservation of living marine resources in those areas. Table 1-1 provides details of AFSC research proposed for the period 2024-2029, including general areas of operation, gear and equipment as well as estimated number of days at sea (DAS). To minimize risk of encounters with marine mammals that may occur in the action area, AFSC implements a series of mitigation and monitoring measures which are described in detail in Sections 11 and 13 of this application.

Since publication of the 2019 final rule and LOA for AFSC research (NMFS 2019d, e), some modifications have been proposed for future surveys. For example, during the Gulf of Alaska Shelf and Slope Groundfish Bottom Trawl Survey, trawls using the Poly Nor'Eastern would be reduced from 820 stations and 3 boats down to 550 stations. During this period, the need for additional surveys could arise, or some of the identified surveys could be eliminated or reduced in effort. Therefore, research activities described in this application are not specifically limited to the surveys shown in Table 1-2 but would use similar gear and would be commensurate in scope and area of activity.

The following list provides a brief summary of discontinued research or gear, modifications to existing research such as new research areas or different gear, and new research proposed beginning in 2024. These additions or modifications to research since 2019 are indicated in Table 1-1 by bold or italicized text as well as highlighted cells as defined in the table "Color key" above the table. Table 1-2 presents proposed research according to the main gear type used by specific research area. For example, the first rows of the table show how many studies will use hook and line gear such as longline or rod and reel, and in which research areas (*i.e.*, BSAIRA or GOARA, etc.). In other words, Table 1-2 presents the Preferred Alternative as a "tally" of studies by gear type and area.

Discontinued Studies (26 Total)

- Acoustic Trawl Rockfish Study in the GOARA (59 Poly Nor'Eastern trawls, echosounders, and camera systems);
- Acoustic Assessment of Rockfish in Untrawlable Areas of the GOARA (6 Poly Nor'Eastern trawls and echosounders);
- ADFG Large-mesh trawl survey of Gulf of Alaska (GOA) and Eastern Aleutian Islands (380 eastern otter trawls);
- ADFG Small-mesh shrimp and forage fish survey in the GOARA (150 shrimp trawls);
- Arctic Coastal Ecosystem Surveys in the CSBSRA (24 plumb staff beam trawls plus beach seining and midwater trawls);
- Arctic Ecosystem Integrated Survey in the Bering Sea/Aleutian Islands (BSAI) and CSBSRA (surface trawls, midwater trawls, bongo net tows, and echosounders);
- Atka Mackerel Tag Movement and Abundance in the Aleutian Islands (approximately [~] 90 tows per year using a Bering Sea combo bottom trawl);
- Barotrauma and Tagging of Deep Water Rockfish (7 longline sets);
- Gulf of Alaska Assessment (surface trawls and bongo nets);
- Gulf of Alaska Coral/Sponge Model Validation (camera systems);
- Cold Water Coral Recruitment (SCUBA/snorkeling);
- Crab Studies in Kodiak Island Area (20 beam trawl tows, pots, beach seines and SCUBA) ;
- Deep Water Groundfish Surveys (20 sets of bottom longline gear);
- Habitat, Blue King Crabs, and the Benthic Community: Comparisons within Space and Time (200 plumb staff beam trawls plus 200 rock dredge stations);
- Octopus Gear Trial and Maturity Study (pot gear);
- *Primnoa* Distribution, Recovery and Genetic Connectivity in the Gulf of Alaska (towed cameras and echosounders);
- Reproductive Ecology of Red Tree Coral (SCUBA);
- Response of Fish to Drop Camera Systems (cameras and echosounders);
- Rockfish Habitat Studies/Reproduction of Groundfish (8 commercial bottom trawl tows, bongo nets and cameras);
- Rockfish Reproduction Charters (8 commercial bottom trawl tows);

- Seasonal Distribution and Habitat Use of Managed Fish Species in Upper Cook Inlet, AK (3 small bottom trawl tows plus beach seines);
- St. John Baptist Bay Sablefish Ecology (Bongo nets and ring nets)
- Sun to Sea Camp (beach seines and ring nets);
- The Distribution and Habitat Association of Juvenile *Chionoecetes* Crabs (bottom sled with camera);
- Using Trawl Cameras instead of Bottom Trawls to Estimate Fish Abundance in the Gulf of Alaska and Aleutian Islands (40 Poly Nor'Eastern, bottom trawls); and
- Yukon Delta Nearshore Surveys (50 push trawls, 50 midwater Kodiak trawls, pelagic nets and ring nets).

Studies with Reduced Effort 2024-2029 (5 Total)

- Gulf of Alaska Shelf and Slope Groundfish Bottom Trawl Survey– trawls using the Poly Nor'Eastern would be reduced from 820 stations and 3 boats to 550 stations;
- Gulf of Alaska Ichthyoplankton Survey Spring – Bottom trawls with net sounders would no longer be conducted and bongo net tows would be reduced to 150 from 250;
- Eastern Bering Sea Groundfish Bottom Trawl Survey – DAS would be reduced to 75 from 130 but number of bottom trawls using the eastern otter trawl would remain the same;
- Fishing Technology Studies to Reduce Bycatch and Habitat Effects of Fishing – DAS would be reduced from 14 to 7 but total bottom trawls using various commercial gear would remain the same; and
- Eastern Bering Sea Ichthyoplankton Survey Spring – 150 Bongo net tows only reduced from - 50 bottom trawls, 50 mid-water trawls, 50 Bongo tows for larval pollock, 30 multiple-opening/closing net tows and 150 Neuston net tows.

Studies with Increased Effort 2024-2029 (3 Total)

- Southeast Alaska Coastal Monitoring – DAS increased to 12-28 from 1-7, no changes to gear or number of tows;
- Aleutian Islands Bottom Trawl Survey – Poly Nor'Eastern bottom trawls increased to 550 from 420; and
- GOA/Eastern Bering Sea (EBS)/Aleutian Islands Longline Surveys – 90 stations/yr (increased from 75), 160 sets rotated between GOA and BSAI.

Existing Studies with New Gear Planned for 2024-2029 (2 Total)

- Northern Bering Sea Ecosystem Surface Trawl Survey – 50 beam trawl tows added; and
- Arctic Ecosystem Distributed Biological Observatory – 50 beam trawl tows added.

New Studies with Existing Gear Planned for 2024-2029 (15 Total)

- Alaska Red King Crab Growth and Survival – 10 beam trawl tows conducted from a small boat;
- Kodiak Age-0/1 Pacific Cod Nursery Habitat – 64 beam trawl tows conducted from a small boat, 64 beach seine hauls, 40 baited camera sets and 75 seines;

- Gulf of Alaska Large-Scale Age-0/1 Pacific Cod Nursery Habitat – 100 beach seine hauls, 500 baited camera sets;
- Gulf of Alaska Coral Settlement Plate Recovery – 3 settlement plats deployed and retrieved with Uncrewed Systems (UxS);
- Alaska UxS Acoustic Survey GOARA, BSAIRA, and CSBSRA – UxS in conjunction with EK80 echosounders measure abundance and distribution of fish and plankton;
- Alaska Moored Echosounders GOARA, BSAIRA, and CSBSRA – Autonomous echosounders are mounted on seafloor to monitor fish and plankton abundance and behavior;
- Gulf of Alaska EVOS Benthic Survey – 60 SCUBA transects per year;
- Alaska Aquaculture Research – Scuba and hand nets and pens used to conduct research on *Clupea pallassii* (Pacific herring) and *Crassostrea giga* (Pacific oyster);
- Northern Bering Sea Effects of Trawling Study – 100 Poly Nor'Eastern tows and 200 grab samples to study bottom-trawling effects in the Northern Bering Sea;
- Northern Bering Sea Bottom Trawl Survey – 144 Poly Nor'Eastern tows;
- Northern Bering Sea Integrated Ecosystem Research Survey – 75 surface trawls using a Nordic 264, 75 beam trawls, 35 midwater trawls using an anchovy trawl or equivalent, and 75 Bongo net tows;
- Pacific Cod Tagging Bering Sea – 80 deployments of pot gear
- Alaska Collaborative Crab Tagging Survey – 10-800 pots deployed per survey;
- Bristol Bay Red King Crab Settlement Survey - 48 transects surveyed by SCUBA divers, deployment of 48 larval collection sacks and cameras; and
- IPHC Catch Protection Survey – 20 sets of snap longline gear in the GOARA.

<u>New Studies Planned for 2024-2029 with Gear not Previously Used by AFSC (2 Total)</u>

- Gulf of Alaska (Science-Industry Rockfish Research Collaboration in Alaska) SIRCCA Trawl Survey – 50 bottom trawls using nephrops gear;
- Alaska Longline Slinky Pot Research GOARA, BSAIRA, and CSBSRA- 1 set of 50-120 slinky pots per day for 14 days, 700-1680 pots total.

Table 1-1. AFSC Proposed Research 2024-2029

Color Key

Denotes research area GOARA, BSAIRA or CSBSRA	*Reduced effort 2024-2029*	***Increased effort 2024-2029***	***New research 2024-2029***	***New gear 2024-2029***

Study Name	Description	General Area of Operation	Days at Sea (DAS)	Season/ Frequency	Vessels Used	Gear Type	Gear Details	No. Tows/Samples
GOARA								
Studies Using Trawl Gear								
Fishing Technology Studies to Reduce Bycatch and Habitat Effects of Fishing	Develop and test modifications to fishing gear and methods to reduce incidental effects on habitat and non-target fish. Stages include: observation and analysis of fish behavior and gear performance with conventional gear, design modifications and iterative observations to confirm design functions, performance testing (bycatch reduction or reduced effect on habitat). Focus on observations with cameras and imaging sonar, while later stages use comparisons of catches under commercial fishing conditions.	GOA	7	All seasons Annual	Fishing vessels	Bottom trawl with net sounders	Net type: Various commercial bottom trawls Net size: Operating net width 18-24 m, height 4-8 m. Mesh size 8 in (forward sections) to 5.5-4 in (aft sections). Footropes large bobbins or disks (18-24 in diameter) with 18-48 in spacing between Tow speed: 3-3.5 knots (kts). Tow duration: Experimental tows - 0.75-6.5 hrs. Depth: 66-154 m Marport headrope and wing sounders, 40 kilohertz (kHz)	20–40/season
						Mid-water trawl	Net type: Various Commercial mid-water trawls Net size: Operating net width 75-136 m, height 10-20 m, with size highly dependent on vessel power. Very large meshes (128-64 m) forward tapering gradually to 4 in in aft sections Tow speed: 3-3.5 kts Tow duration: Experimental tows - 0.75-3 hrs Depth: 66-154 m	See above.
Western Gulf of Alaska Juvenile Fish Survey Fall	Critical to understanding how environmental variability and change affects abundance, distribution, and recruitment of commercially and ecologically important juvenile fishes. Assess abundance and condition of age-0 walleye pollock prior to the onset of the first winter. Ecosystem observations and physical and biological data collection.	GOA	35	Fall Biennial	NOAA Ship	Mid-water trawl	Net type: Anchovy trawl or equivalent Net size: 12 meters (m) x 12 m, 3 mm cod end liner Tow speed: 2-3 kts Tow duration: depth dependent, up to 1 hr Depth: oblique to bottom (<200 m)	50-75
						Beam trawl	Net type: beam trawl Net size: 1m x 1m, 3- mm mesh, 4 mm cod end liner Tow speed: 1-2 kts Tow duration: 10 min Depth: 50-200 m	50-75
						Bongo net	Net type: Bongo tandem Net size: 0.6 m each ring (mesh 505 mu; 333 mu) Tow speed: 1 kts Tow duration: 15-45 min Depth: 1-200 m	200

Study Name	Description	General Area of Operation	Days at Sea (DAS)	Season/ Frequency	Vessels Used	Gear Type	Gear Details	No. Tows/Samples
EBS/GOA EcoFOCI Mooring Fall/spring	In collaboration with NOAA Research's Pacific Marine Environmental Laboratory. Recover and deploy surface and subsurface moorings along 70 m isobath annually in spring and fall. Collect oceanographic data on currents, temperature, salinity, and dissolved oxygen. Conduct net tows around moorings at the time deployments to assess the zoo- and ichthyoplankton community. Conduct subset of Bongo net tows around "Unimak Box" to assess plankton community composition.	GOA	31	Fall, Spring Biennial	NOAA Ship Large Chartered Fishing Vessel	Bottom trawl with net sounders	Net type: Poly Nor'Eastern, Tow speed: 3-5 kts Tow duration: 20 min Depth: 150-700 m Marport headrope and wing sounders, 40 kHz	150
						Bongo net	Same as above	150
Alaska Red King Crab Growth and Survival	***Examine survival and growth of red king crab juveniles; examine the effects of density on survival and growth; determine the effects of red king crab on the ecosystem and the effect of predators.***	***GOA***	*7*		***Small boat Skiff***	***Beam trawl***	***Net type: Polypropylene Beam trawl Net size: 2 m opening Tow speed:1.5 kts Tow duration: 3-5 min Depth:15m***	***10 (conducted previous to 2019)***
Gulf of Alaska Shelf and Slope Groundfish Bottom Trawl	Monitor trends in abundance and distribution of groundfish populations. Based on a stratified-random design and area-swept method to estimate abundance. Identify, weight and count all living organisms, and take biological samples from key groundfish species or other species of interest. Catch data used to estimate relative abundance and determine ABC and TAC.	GOA	75	Summer Biennial	Large Chartered Fishing Vessel	Bottom trawl	Net type: Poly Nor'Eastern high rise trawl Tow speed: 3 kts Tow duration: 15 min (1.4 kilometers [km] tow length) Depth: out to 1000 m depth	*550 (reduced from 820 stations and 3 boats)*
Gulf of Alaska Biennial Walleye Pollock Acoustic Trawl Survey Summer	Estimate mid-water abundance and distribution of walleye pollock in GOA shelf. Collect acoustic data series of parallel transects with echosounder. Five split-beam transducers (18, 38, 70, 120, and 200 kHz) are mounted on vessel. Conduct trawl when sufficient echosign is encountered, to identify ensonified targets. Net sounders position trawl in water column and monitor catch. Collect physical oceanographic measurements throughout cruise.	GOA	60	Summer Biennial	NOAA Ship	Bottom trawl	Net type: Poly Nor'Eastern Tow speed: 3 kts Tow duration:10-20 min Depth: 50-600 m Marport headrope and wing sounders, 40 kHz	20
						Mid-water trawl with net sounders	Net type: Aleutian wing trawl Tow speed: 3 kts Tow duration: 10 min-1 hr Depth: 50-600 m	100
						Small mid-water trawl	Net type: Methot or similar Tow speed: 3 kts Tow duration: up to 1 hr Depth: 50-600 m	10
Gulf of Alaska/Shelikof Walleye Pollock Acoustic Trawl Survey Winter	Same as above except during winter.	GOA Shelikof Straight	31	Winter Annual	Same as above	Bottom trawl	Poly Nor'Eastern Same as above during summer survey.	10
						Mid-water trawl with net sounders	Aleutian wing trawl Same as above during summer survey.	20
Gulf of Alaska/Shumagin/ Sanak Walleye Pollock Acoustic Trawl Survey Winter	Same as above in Shelikof	GOA Shumagin Sanak	7-31	Winter Annual	Same as above	Mid-water trawl with net sounders	Aleutian wing trawl Same as above during summer survey.	20

Study Name	Description	General Area of Operation	Days at Sea (DAS)	Season/ Frequency	Vessels Used	Gear Type	Gear Details	No. Tows/Samples
Southeast Alaska Coastal Monitoring	Monitor intra- and inter-annual biophysical features in coastal marine ecosystem in relation to the distribution, abundance, feeding, bioenergetics, and migratory behavior patterns of wild and hatchery juvenile salmon and associated epipelagic ichthyofauna. Identify processes or factors that influence growth and survival of salmon in different marine habitats along seaward migration corridors and GOA.	GOA	***12 - 28 (increased from 1 - 7)***	Summer Annual	Large Chartered Fishing Vessels	Surface trawl	Net type: Nordic 264 surface rope trawl Net size: 20 m x 20 m Tow speed: 3 kts Tow duration: 20 min Depth: 1-20 m	48
						Bongo net	Same as above for "Western Gulf of Alaska Juvenile Fish Survey Fall"	64
Kodiak Age-0/1 Pacific Cod Nursery Habitat	***Evaluate seasonal habitat use and movements by juvenile Pacific cod in GOA. Demersal beach seine surveys sample juvenile fish after settlement in nursery habitats and provide the only reliable measures of age-0 and age-1 abundance of commercially important gadids. Seine surveys typically collect post-settled age-0 gadids in 2-4 m of water during late summer/early fall at densities several orders of magnitude higher than those reported offshore. As such, seine surveys offer a means of understanding 1st year of life survival.***	***GOA***	***50***		***Small boat Skiff***	***Beam trawl*** ***(also conduct beach seine for this survey as listed under "Other Gear" below)***	***Net type: beam trawl*** ***Net size: 1m x 1m, 3- mm mesh, 4 mm cod end liner*** ***Tow speed: 1-2 kts*** ***Tow duration: 10 min*** ***Depth: 50-200 m***	***64***
Gulf of Alaska (Science-Industry Rockfish Research Collaboration in Alaska) SIRCCA Trawl Survey	***Cooperative rockfish survey with fishing industry to supplement GOA AFSC bottom trawl survey sampling, focused on calibrating fishing power of vessels and increasing data collection in untrawlable habitats***	***GOA***	***100***		***Large chartered fishing vessel***	***Nephrops trawl (new gear)***	***Fishing industry bottom trawl.*** ***A nephrops trawl is towed on the seabed, with the mouth held open by a pair of otter boards (trawl doors). It's designed and rigged to be towed over rough seabeds to target nephrops.***	***50***
Studies Using Other Gears								
Gulf of Alaska Ichthyoplankton Survey Spring	Assess abundance, distribution, size structure, and survival of larvae of key economic and ecological species (walleye pollock, Pacific cod, arrowtooth flounder, sablefish, rockfish), and investigate effects of climate variability on mechanisms leading to recruitment including transport pathways from spawning to potential nursery locations.	GOA	31	Spring Biennial	NOAA Ship, Large chartered fishing vessel	Bongo net *(removed 50 bottom trawls with net sounders)*	Net type: Plankton net Net size: 20 cm and 60 cm Tow speed: 1.5 - 2.5 kts Tow duration: 10 - 30 min Depth: 0 - 300 m	*150 (reduced from: 250 tows)*
GOA/EBS/Aleutian Islands Longline Survey	Monitor and assess the status of sablefish and other groundfish in Alaska. Whale depredation is a common occurrence during the survey by both killer whales (Bering Sea, Aleutian Islands, Western GOA, Central GOA) and sperm whales (Central GOA, Eastern GOA). Opportunistic whale depredation studies occur during survey to help quantify the amount of depredation.	GOA	80	Summer Annual	Large chartered fishing vessel	Longline	Mainline length: 16 km Set Depth: bottom Gangion length: 1.5 m Gangion spacing: 2 m Hook size and type: 13/0 circle # of hooks and bait: 7,200 hooks baited with squid Soak time: 3 hrs	***90 stations/yr (increased from 75)*** ***160 sets rotated between GOA and BSAI***
Little Port Walter Research Station and Experimental Hatchery	Survey methods include a weir at Sashin Creek, fish aggregation device in the inner bay, fish culture and hatchery facilities, boat surveys and sampling, and freshwater sampling.	GOA shoreside	365	Year round Annual	Shoreside	Various	4.5 in. mesh gillnet with pingers, Beach seine 1 Cast net, Hoop Net, Fyke net, Net pen, Dip net, Multiple open/close net, Diving (SCUBA/Snorkeling), weir across Sashin Creek.	50 gillnet 50 beach seine 50 cast 20 hoop 20 fyke 1 net pen >100 dip net

Study Name	Description	General Area of Operation	Days at Sea (DAS)	Season/ Frequency	Vessels Used	Gear Type	Gear Details	No. Tows/Samples
Ted Stevens Marine Research Institute (TSMRI) Alaska Sea Week	Contribute to long-term monitoring of sea stars in Alaska by the Gulf Watch Alaska (GWA) nearshore program. Annual sea star surveys by K-6th grade students contribute valuable information about sea star populations in southeast Alaska. Count, measure, and record health of sea stars within 2 x 20 m transects on beaches around Juneau. Repeated surveys accumulate long-term data to assess responses to changing environmental factors and information for teaching.	GOA shoreside	10	Spring Summer Annual	Shoreside	Shoreline swaths with transect tape	Transect tape	10
Alaska EFH Mapping (FISHPAC)	Collects acoustic and other environmental data in trawl survey areas to develop numerical habitat models for groundfish and shellfish. Bathymetric data are also collected for nautical chart updates.	GOA	20	Summer Intermittent	NOAA Ship Large Chartered Fishing Vessel	Echosounders and Sonar Bottom Sampler Towed Camera Penetrometer	Scientific single beam (38 kHz) and multibeam echosounders (50, 100 kHz); side-scan sonar (180,455 kHz),	Echosounder 5,500 Linear km Bottom sampler 50 stations Towed camera 20 stations Penetrometer 92 stations
Auke Bay Lab Dive Checkouts/Facilities Dives	Perform proficiency dives to keep diver's certification active, and to inspect and maintain the site's saltwater intakes.	GOA	1	Year round Annual	Small boat Shoreside	Diving	SCUBA Snorkel	12
Diver Training, Maintenance, and Collection Operations	Diver checkouts/training, recovery/ replacement of sea water system intake screens, retrieval of temperature loggers, collection of live aquarium specimens for outreach displays at the TSMRI, Kodiak Lab, and other similar operations.	GOA	7	Year round Annual	Small boat Shoreside	Diving	SCUBA Snorkel	N/A
Auke Creek Weir and Research Hatchery	The Auke Creek weir sits above the high tide line in Auke Bay, Juneau, AK. The weir captures outmigrating salmonids in the late winter and spring and then captures returning adult salmonids in the late spring through fall. Hatchery operations include the retention of a limited number of adult salmon, the collection of gametes, incubation of eggs, and short-term rearing of fry for stocking into Auke Lake.	Inland Southeast Alaska	260	Year round Daily (Feb – Oct)	Shoreside	Fish trap attached to weir	Fish trap attached to weir structure across mouth of Auke Creek	N/A
Gulf of Alaska Juvenile Sablefish Tagging	Tag and release juvenile sablefish with 1,000 numerical spaghetti tags and 80 surgically implanted electronic archival tags. Electronic archival tags programmed to continuously record temperature and depth and both numerical and electronic tags will be recovered as sablefish recruit to the commercial fishery at ages 4 and 5.	GOA	4	Summer Annual	Large Chartered Fishing Vessel	Rod and Reel	4 rod and reel herring type jig fishing 3-4 2/0 hooks per jigging rig, with 3-4-ounce (oz) bank sinkers. Squid is the bait.	16
Kodiak Age-0/1 Pacific Cod Nursery Habitat	***Evaluate seasonal habitat use and movements by juvenile Pacific cod in GOA. Demersal beach seine surveys sample juvenile fish after settlement in nursery habitats and provide the only reliable measures of age-0 and age-1 abundance of commercially important gadids. Seine surveys typically collect post-settled age-0 gadids in 2-4 m of water during late summer/early fall at densities several orders of magnitude higher than those reported offshore. As such, seine surveys offer a means of understanding 1st year of life survival.***	***GOA Kodiak region***	***50***	***Spring Annual***	***Shoreside***	***Beach seine Baited Cameras (also conduct beam trawl for this survey as listed under "Trawl Gear" above)***	***Net type: Seine Net size: 25 m Mesh size: 8 mm Set duration: 15 min***	***64 seine hauls 40 baited camera sets 75 seines***

Study Name	Description	General Area of Operation	Days at Sea (DAS)	Season/ Frequency	Vessels Used	Gear Type	Gear Details	No. Tows/Samples
Gulf of Alaska Large-Scale Age-0/1 Pacific Cod Nursery Habitat	*Same as above near Kodiak.*	*GOA*	*30*	*Summer Annual*	*Small boat Shoreside*	*Beach seine Baited Cameras*	*See above*	*100 seine hauls 500 baited camera sets*
Gulf of Alaska Coral Settlement Plate Recovery	*Alaska Initiative Deep Sea coral funded project to study reproduction and coral recruitment in SE Alaska.*	*GOA*	*2*	*Spring Summer Annual*	*Large chartered fishing vessel*	*UxS Camera system Settlement Plates*	*Settlement plates deployed and retrieved with UxS such as an Autonomous Underwater Vehicle (AUV)*	*3*
Alaska UxS Acoustic Survey	*UxS measure abundance and distribution of fish and plankton. Uncrewed Surface Vehicles (USVs) such as a DriX to keep pace with a fisheries survey vessel (FSV, NOAA Ship Oscar Dyson) without delaying ship's operation and allow concurrent acoustic and trawl measurements. Ship and USV to survey alternate transects, staying within ~3 hrs of each other. USV acoustic observations summarized onboard USV and transmitted to FSV. Ship to conduct trawls, crossing to trawl on USV transects as needed. Tandem USV/FSV survey substantially reduces FSV time, without degrading data quality. Wind-powered UxS such as a Saildrone used independently from a ship.*	*GOA (see also BSAI and Chukchi Sea)*	*70*	*Summer (maybe Spring) Annual*	*NOAA ship*	*Simrad EK80 split-beam echosounders UxS*	*EK80 split-beam echosounders (38, 70, 120, 200 kHz transducers) equivalent to those used on NOAA ships*	*50 percent (%) of line transects of MACE Acoustic trawl activities*
Alaska Moored Echosounders	*Autonomous echosounders mounted on seafloor to monitor fish and plankton abundance and behavior. Used to complement abundance surveys to monitor marine life throughout an annual cycle, outside of period when ship-based surveys are available. Moorings deployed for 1 yr in locations TBD (likely to include vicinity of U.S./Russia border, northern Bering Sea, or GOA). Up to 12 moorings during permit period.*	*GOA (see also BSAI and Chukchi Sea)*	*365*	*Year round Annual*	*Mooring*	*Simrad EK80 split-beam or broadband WBAT echosounders operating at 18, 38, 70, 120, 200 kHz*	*Low-power Simrad wide-band autonomous transceiver (WBAT) echosounders. Stationary, self-contained, upward-looking echosounder operating at 70 kHz (possibly 38, 200 kHz if deployed in shallow water <75 m). Similar to instruments on NOAA ship Dyson will be moored on seafloor and cone-shaped beam will look upwards. Operate ~ 5% of time (i.e., ~3 min/hr)*	*Continuous (6 min/hr)*
Alaska Longline Slinky Pot Research	*Exploration of slinky pot fishing characteristics during longline survey. Goals would include determining selectivity, catch composition, catch efficiency, and interaction with seafloor habitats of slinky pots.*	*GOA (see also BSAI and Chukchi Sea)*	*14*	*Summer Annual*	*Large chartered fishing vessel*	*Longlined collapsible "slinky" pot (NEW GEAR)*	*Collapsible, lightweight mesh pots filled with bait, attached to a long line, and set at the bottom.*	*1 set of 50-120 pots per day, 700-1680 pots total*
Gulf of Alaska EVOS Benthic Survey	*Transect and quadrat counts of benthic species and take sediment cores and sieve them for later processing. Surveys performed in spring and winter under kelp farms and nearby control sites.*	*GOA*	*20*	*Year round Annual*	*Chartered small boat*	*Camera system Bottom/Sediment Sampler*	*SCUBA transects*	*60 transects/yr*
Alaska Aquaculture Research	*Aquaculture related surveys/research on Clupea pallassii (Pacific herring) and Crassostrea giga (Pacific oyster).*	*GOA*	*N/A*	*Year round Monthly*	*Shoreside*	*SCUBA Snorkeling Phytoplankton net (included with hand nets) Net pens*	*10 x 10 ft or 20 x 20 ft pens with ~ 1 in mesh size.*	*Unknown*
BSAIRA								

Study Name	Description	General Area of Operation	Days at Sea (DAS)	Season/ Frequency	Vessels Used	Gear Type	Gear Details	No. Tows/Samples
Studies Using Trawl Gear								
Eastern Bering Sea Groundfish Bottom Trawl	Collect data on: 1) distribution, abundance, and biological condition of commercially important groundfish and crab species for NPFMC; 2) Catch per unit effort (CPUE), size and age composition data for U.S. commercial fisheries; and 3) Support studies on biology, behavior, and dynamics of key ecosystem components.	Bering Sea	*75 (reduced from 130)*		Large Chartered Fishing Vessel	Bottom trawl with net sounders	Net type: 83-112 Eastern otter trawl Net size: 83 ft headrope, 112 ft footrope Tow speed: 3 kts Tow duration: 30 min Depth: 20 to 200 m Marport headrope and wing sounders, 40 kHz	376
						Bottom trawl fished as mid-water trawl	Same as above Eastern Otter Trawl fished as midwater trawl	25 samples per vessel
Fishing Technology Studies to Reduce Bycatch and Habitat Effects of Fishing	See above for GOA	BSAI	*7 (reduced from 14)*	Year round Annual	Fishing vessel	Bottom trawl	Net type: Various commercial bottom trawls Net size: Operating net width 18-24 m, height 4-8 m. Mesh size 8 in (forward sections) to 5.5 to 4 in (aft sections). Footropes large bobbins or disks (18-24 in diameter) with substantial (18-48 in) spacing in between 18 m Tow speed: 3-3.5 kts Tow duration: Experimental tows - 0.75-6.5 hrs Depth: 66-154 m Marport headrope and wing sounders, 40 kHz	40-90/yr
						Mid-water trawl	Net type: Various Commercial mid-water trawls Net size: Operating net width 75-136 m, height 10-20 m, with size highly dependent on vessel power. Large mesh (64-128 m) forward tapering gradually to 4 in in aft sections Tow speed: 3-3.5 kts Tow duration: Experimental tows - 0.75-3 hrs Depth: 66-154 m	40-90/yr
Eastern Bering Sea Slope Bottom Trawl Survey Summer	Locate and successfully trawl stratified random locations on a variety of slope habitats; describe composition, spatial and depth distribution, and relative abundance of groundfish and invertebrate resources; collect biological data from a variety of commercially and ecologically important species; and collect environmental parameters.	Bering Sea	65	Summer Biennial (when funded)	Large chartered fishing vessel	Bottom trawl with net sounders	Net type: Poly Nor'Eastern Net size: 90 ft headrope, 100 ft footrope Tow speed: 2.5 kts Tow duration: 30 min Depth: 200-1200 m Marport headrope and wing sounders, 40 kHz	200
Aleutian Islands Bottom Trawl Survey	Monitor trends in abundance and distribution of groundfish populations. Multi-species survey based on a stratified-random design and the area-swept method of estimating abundance. Scientific crew identify, weigh and count all living organisms, and collect biological samples from key groundfish species or other species of interest.	Aleutian Islands	75	Summer Biennial	Large Chartered Fishing Vessels	Bottom trawl with net sounders	Net type: Poly Nor'Eastern bottom trawl with roller gear Net size: 24 m head and footrope Tow speed: 3 kts Tow duration: 15 min Depth: out to 500 m Marport headrope and wing sounders, 40 kHz	***550 (Increased from 420)***

Study Name	Description	General Area of Operation	Days at Sea (DAS)	Season/ Frequency	Vessels Used	Gear Type	Gear Details	No. Tows/Samples
Northern Bering Sea Ecosystem Surface Trawl Survey	Examine early marine ecology of important groundfish, western Alaska salmon, forage fish, and oceanographic indices affecting early marine and overwinter survival of groundfish.	Bering Sea	25	Fall Annual	Large Chartered Fishing Vessel	***Beam trawl (new gear for this survey)***	***Net type: Beam trawl Net size: 7 mm; mesh 4 mm; mouth opening 2.1 m Tow speed: 1 kts Tow duration: 5 min Depth: 18-65 m***	***50***
						Surface trawl	Net type: Cantrawl Net size: 55 m width, 25 m depth Tow speed: 3.5 to 5 kts Tow duration: 30 min Depth: surface to 25 m depth	110
						Bongo net	Net type: Bongo zooplankton Net size: 505 µm and 143 µm mesh Tow speed: 1 m/sec Tow duration: depends on depth Depth: surface to 1 m off bottom	200
Eastern Bering Sea Juvenile Fish Survey Fall	Same as above in GOA (Western Gulf of Alaska Juvenile Fish Survey Fall).	Bering Sea	30	Fall Biennial	NOAA ship Large chartered fishing vessel	Mid-water trawl	Same as above in GOA. Anchovy trawl or equivalent	60
						Beam trawl	Net type: Beam trawl Net size: 7 mm mesh, 4 mm cod end liner Tow speed: 1 - 2 kts Tow duration: 10 min Depth: 50-200 m	60
						Bongo net	Net type: Plankton Net size: 20 cm and 60 cm Tow speed: 1.5 - 2.5 kts Tow duration: 10 - 30 min Depth: 0-300 m	150
Eastern Bering Sea Walleye Pollock Acoustic Trawl Survey Summer	Same survey as in GOA (Gulf of Alaska Biennial Walleye Pollock Acoustic-Summer).	Eastern Bering Sea	62	Summer Biennial	NOAA ship	Bottom trawl with net sounders	Same as above in GOA, Poly Nor'Eastern trawl	130
						Mid-water trawl with net sounders	Same as above in GOA, Aleutian wing trawl	See above
Bering Sea/Bogoslof Walleye Pollock Acoustic Trawl Survey Winter	Same survey as above in GOA and Eastern Bering Sea.	Bering Sea Bogoslof Island Region	31	Winter Biennial	NOAA ship	Bottom trawl with net sounders	Same as above in GOA and Eastern Bering Sea using Poly Nor'Eastern trawl.	130
						Mid-water trawl with net sounders	Same as above in GOA and Eastern Bering Sea. Aleutian wing trawl	See above

Study Name	Description	General Area of Operation	Days at Sea (DAS)	Season/ Frequency	Vessels Used	Gear Type	Gear Details	No. Tows/Samples
Northern Bering Sea Effects of Trawling Study	*Experimental study of bottom-trawling effects on essential fish habitat in the Northern Bering Sea.*	*BSAI*	*30*	*Summer Annual*	*Large chartered fishing vessel*	*Bottom trawl*	*Net type: Poly Nor'Eastern* *Tow speed: 3-5 kts* *Tow duration: 20 min* *Depth: 150-700 m* *Marport headrope and wing sounders, 40 kHz*	*100 tows & 200 grab samples*
Northern Bering Sea Bottom Trawl Survey	*See Eastern Bering Sea Groundfish Bottom Trawl.*	*Northern Bering Sea (new area)*	*26*	*Summer Annual*	*Large chartered fishing vessel* *Small skiff*	*Bottom trawl*	*See above for Poly Nor-Eastern*	*144*
Northern Bering Sea Integrated Ecosystem Research Survey	*Surveying distribution and abundance of pelagic fish species and biological and physical oceanographic indices to evaluate the effect of climate change on the health of pelagic fish in this region. The status of juvenile salmon populations are evaluated as a secondary objective.*	*Northern Bering Sea*	*50*	*Summer* *Fall* *Biennial*	*Large chartered fishing vessel*	*Surface trawl*	*Net type: Nordic 264 surface rope trawl* *Net size: 20 m x 20 m* *Tow speed: 3 kts* *Tow duration: 20 min* *Depth: 1-20 m*	*75*
						Beam trawl	*Net type: beam trawl* *Net size: 1m x 1m, 3- mm mesh, 4 mm cod end liner* *Tow speed: 1-2 kts* *Tow duration: 10 min* *Depth: 50-200 m*	*75*
						Mid-water trawl	*Net type: Anchovy trawl or equivalent* *Net size: 12 m x 12 m, 3 mm cod end liner* *Tow speed: 2-3 kts* *Tow duration: depth dependent, up to 1 hr* *Depth: oblique to bottom (<200 m)*	*35*
						Bongo net	*Net type: Plankton net* *Net size: 20 cm and 60 cm* *Tow speed: 1.5 - 2.5 kts* *Tow duration: 10 - 30 min* *Depth: 0 - 300 m*	*75*
Studies Using Other Gears								
Eastern Bering Sea Ichthyoplankton Survey Spring	Assess distribution and condition of age-1 walleye pollock immediately after first winter; evaluate recruitment potential of emergent age-1s, a full year prior to assessment during acoustic or bottom trawl surveys. Determine abundance, distribution, size structure, and survival of other key economic and ecological species in region, and investigate effects of climate variability on transport pathways from spawning to potential nursery locations for juveniles.	BSAI	31	Spring Biennial	NOAA ship Large chartered fishing vessel	Bongo net	Net type: Plankton net Net size: 20 cm and 60 cm Tow speed: 1.5 - 2.5 kts Tow duration: 10 - 30 min Depth: 0 - 300 m	*150 (reduced from:* *- 50 bottom trawls* *- 50 mid-water* *- 50 Bongo For Larval pollock,* *- 150 Bongo* *- 30 multiple-opening/closing net* *- 150 Neuston net)*

Study Name	Description	General Area of Operation	Days at Sea (DAS)	Season/ Frequency	Vessels Used	Gear Type	Gear Details	No. Tows/Samples
EBS/GOA EcoFOCI Mooring Fall/Spring	Same as above in GOA.	BSAI	31	Fall Spring Biennial	NOAA ship Large chartered fishing vessel	Bottom trawl with net sounders	Net type: Poly Nor'Eastern, Tow speed: 3-5 kts Tow duration: 20 min Depth: 150-700 m Marport headrope and wing sounders, 40 kHz	150
						Bongo net	Net type: Plankton Net size: 20 cm and 60 cm Tow speed: 1.5 - 2.5 kts Tow duration: 10 - 30 min Depth: 0 - 300 m	150
						Neuston net	Net type: Plankton Net size: .25 m2 Tow speed: 1 - 3 kts Tow duration: 10 min Depth: surface	150
Alaska EFH Mapping (FISHPAC)	Same as above in GOA.	Northern Bering Sea Eastern Bering Sea	20	Summer Intermittent	NOAA ship Large chartered fishing vessel	Echosounders Bottom Sampler Towed Camera Penetrometer	Same as above in GOA	Echosounder Linear km: EBS 5,700, NBS TBD Bottom sampler 50 stations Towed camera 20 stations Penetrometer 92 stations
GOA/EBS/Aleutian Islands Longline Survey	Same as above in GOA.	Eastern Bering Sea and Aleutian Islands	80	Summer Annual	Large chartered fishing vessel	Longline	Same as above in GOA	***90 stations/yr (increased from 75) 160 sets rotated between GOA and BSAI***
Pacific Cod Tagging Bering Sea	***Work aboard chartered commercial fishing vessels using pot gear and/or bottom trawl gear to capture live Pacific cod. Attach satellite tags to fish and release. In the northern Bering Sea, work with Alaska Native community members and longline fishers to harvest Pacific cod.***	***BSAI***	***14***	***Year round Annual***	***Large chartered fishing vessel Small skiff***	***Pot gear***	***Pots of various sizes constructed of rebar and webbing Bait: fish or squid Soak time: up to 3 days***	***80***
Alaska Collaborative Crab Tagging Survey	***Crab tagging research using many platforms depending on year or season. Can occur during: EBS bottom trawl survey; active commercial fisheries; the Alaska Department of Fish and Game (ADF&G) cost recovery fishery; or chartered commercial vessel. Uses trawl net (EBS survey[1]) or pots (specific charter for tagging) depending on vessel.***	***BSAI***	***5-40***	***Year round Biennial***	***Large chartered fishing vessel***	***Pot gear***	***Pots of various sizes constructed of rebar and webbing Bait: fish or squid Soak time: up to 3 days***	***10-800 pots/ survey***
Alaska UxS Acoustic Survey	***Same survey as in GOA.***	***BSAI***	***70***	***Summer***	***NOAA ship***	***Simrad EK80 split-beam***	***EK80 split-beam echosounders equivalent to those used on NOAA ships***	***50% of line transects of***

[1] Trawls already accounted for during EBS trawl survey and therefore, not duplicated here.

Study Name	Description	General Area of Operation	Days at Sea (DAS)	Season/ Frequency	Vessels Used	Gear Type	Gear Details	No. Tows/Samples
				(maybe spring) Annual		*echosounders with 38, 70, 120, 200 kHz transducers* *UxS*		*MACE Acoustic trawl activities*
Alaska Moored Echosounders	*Same survey as in GOA.*	*BSAI*	*365*	*Year round Annual*	*Mooring*	*Simrad EK80 split-beam or broadband WBAT echosounders operating at 18, 38, 70, 120, 200 kHz*	*Low-power battery powered Simrad WBAT echosounders. This is a stationary, self-contained, upward-looking echosounder operating at 70 kHz (and possibly 38, 200 kHz if deployed in shallow water <75 m). The instruments, similar to those on NOAA ship Dyson, will be moored on the seafloor and the cone-shaped beam will look upwards. They will operate about 5% of the time (i.e., on for ~3 min per hour)*	*Continuous (6 min/hr)*
Alaska Longline Slinky Pot Research	*Same survey as in GOA.*	*BSAI*	*14*	*Summer Annual*	*Large chartered fishing vessel*	*Longlined collapsible "slinky" pot (NEW GEAR)*	*Collapsible, lightweight mesh pots filled with bait, attached to a long line, and set at the bottom.*	*1 set of 50-120 pots per day, 700-1680 pots total*
Bristol Bay Red King Crab Settlement Survey	*Placing and retrieving larval collectors at a number of sites in Bristol Bay (spring deployment; fall retrieval). During one cruise, deploy a benthic sled camera to quantify habitat at each site (likely from a chartered crabber fishing vessel).*	*Bering Sea*	*25*		*Chartered small boat*	*Camera system Anchored gillnet larvae collectors Diving*	*SCUBA transects. Larval collectors consisting of small mesh sacks filled with gillnet that are deployed on the bottom using an anchor and buoy marker.*	*48 stations/yr*
CSBSRA								
Studies Using Trawl Gear								
Chukchi Sea Bottom Trawl Survey	Collect baseline data to monitor distribution, abundance, and general ecology of marine animals living on or near the seafloor to determine effects of climate change and potential impacts from further industrialization.	Chukchi Sea	30	Summer One-off	Large chartered fishing vessel	Bottom trawl with net sounders	Net type: 83-112 Eastern otter trawl Net size: 83 ft headrope, 112 ft footrope Tow speed: 3 kts Tow duration: 15 min Depth: 10 - 100 m Marport headrope and wing sounders, 40 kHz	143
						Bottom trawl	Net type: 3 m Plumb Staff Beam (PSB) Trawl Net size: 3 m wide Tow speed: 1.5 kts Tow duration: 3 min Depth: 10 - 100 m	40
Arctic Ecosystem Distributed Biological Observatory	Evaluate ecosystem status and change in the northern Bering and Chukchi Seas.	Chukchi Sea Beaufort Sea	28	Fall Annual	NOAA ship	***Beam trawl (new gear for this survey)***	***Net type: Beam trawl*** ***Net size: 7 mm mesh, 4 mm cod end liner*** ***Tow speed: 1 - 2 kts*** ***Tow duration: 2-5 min*** ***Depth: 50-200 m***	***50***
						Bongo net	Net type: Plankton Net size: 20 cm and 60 cm diameter Tow speed: 1.5 - 2.5 kts Tow duration: 10 - 30 min Depth: 0 - 300 m	50
Studies Using Other Gears								

Study Name	Description	General Area of Operation	Days at Sea (DAS)	Season/ Frequency	Vessels Used	Gear Type	Gear Details	No. Tows/Samples
Alaska UxS Acoustic Survey	***Same survey as in GOA and BSAI.***	***Chukchi Sea***	***70***	***Summer (maybe spring) Annual***	***NOAA ship***	***Simrad EK80 split-beam echosounders with 38, 70, 120, 200 kHz transducers UxS***	***EK80 split-beam echosounders equivalent to those used on NOAA ships***	***50% of line transects of MACE Acoustic trawl activities***
Alaska Moored Echosounders	***Same survey as in GOA and BSAI.***	***Chukchi Sea***	***365***	***Year round Annual***	***Mooring***	***Simrad EK80 split-beam or broadband WBAT echosounders operating at 18, 38, 70, 120, 200 kHz***	***Low-power battery powered Simrad WBAT echosounders. This is a stationary, self-contained, upward-looking echosounder operating at 70 kHz (and possibly 38, 200 kHz if deployed in shallow water <75 m). The instruments, similar to those on NOAA ship Dyson, will be moored on the seafloor and the cone-shaped beam will look upwards. They will operate about 5% of the time (i.e., on for ~3 min per hour)***	***Continuous (6 min/hr)***
AlaskaLongline Slinky Pot Research	***Same survey as in GOA and BSAI.***	***Chukchi Sea***	***14***	***Summer Annual***	***Large chartered fishing vessel***	***Longlined collapsible "slinky" pot (NEW GEAR)***	***Collapsible, lightweight mesh pots filled with bait, attached to a long line, and set at the bottom.***	***1 set of 50-120 pots per day, 700-1680 pots total***
IPHC Research								
IPHC Fisheries Independent Setline Survey (FISS)	Provide data for the Pacific halibut stock assessment. Catch per unit effort (CPUE) in numbers and weight, size, age, and sex composition of Pacific halibut catch used to monitor changes in abundance, growth, and mortality in the population. Determine Pacific halibut range, local depletion, and fleet distribution effects on halibut. In addition, record catch of other organisms captured incidentally to the gear targeting Pacific halibut to provide insight into bait competition, rate of bait attacks, and composition of catch for the directed commercial Pacific halibut fishery. Depredation by marine mammals on fishing gear are recorded to monitor occurrences and assess whether marine mammal depredation affects that set's data to the extent that it cannot be used in the Pacific halibut stock assessment. IPHC implements protected species avoidance, mitigation, and reporting rules adopted by AFSC.	U.S. West Coast north of 36 degrees 40 minutes North, GOA, Aleutian Island Archipelago, and Bering Sea. Stations laid out on a 10 nm by 10 nm grid within the 20-275 fathoms (fm) depth range most years (may extend to 400 fm or shallow - 10 fm some years)	110	Summer	Chartered vessel	Longline	1,800-foot-long (300 fm) skates, with 100 hooks per skate. Three to ten skates may be fished at a station. Circle hooks (16/0 Mustad or equivalent) along groundline at 18-foot intervals (100 per skate).72-thread count gangions, hard lay material between 24 - 48 inches after tying. Swivels may not be used. Hooks baited with 0.25 lb chum salmon. No setting before 5AM to ensure daylight. Soak time: 5 hrs	1500 sets
IPHC Catch Protection Survey	***Investigate logistics of setting, fishing, and hauling two pilot catch protection devices: a) an underwater shuttle, and b) branchline gear with a sliding shroud system. Investigate performance of gear on catch rates and fish size compared to traditional gear. Help refine potential devices used in Pacific halibut fishery to protect catch on gear from removal or damage by whales and to potentially interrupt the reward cycle leading to depredation. Pilot fishing will not be conducted in the presence of whales and no fish from this study will be retained after sampling.***	***GOA***	***10***	***Spring Summer***	***Chartered vessel***	***Longline***	***Snap gear longline***	***20 sets***

Table 1-2. AFSC/IPHC Research by Gear Type and Estimated and Level of Effort for the Period 2024-2029

Gear Type	General Gear Description	Gulf of Alaska Research Area Research Area (GOARA)			Bering Sea/Aleutian Islands Research Area (BSAIRA)			Chukchi Sea/Beaufort Sea Research Area (CSBSRA)			IPHC Research		
		Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort (tows/samples)	Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort (tows/samples)	Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort	Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort
Hook and Line Gear													
Longline	Mainline length: 16 km Set Depth: bottom Gangion length: 1.5 m Gangion spacing: 2 m Hook size and type: 13/0 circle Hooks and bait: 7,200 hooks baited with squid Soak time: 3 hrs	1	80	90 stations/yr Up to 160 sets (rotated between GOA and BSAI)	1	80	90 stations/yr Up to 160 sets (rotated between GOA and BSAI)	-	-	-	-	-	-
Longline (FISS)	1,800-ft-long (300 fm) skates, with 100 hooks per skate. Three to ten skates may be fished at a station. Circle hooks (16/0 Mustad or equivalent) along groundline at 18-foot intervals (100 per skate). 72-thread count gangions, hard lay material between 24 - 48 inches after tying. Swivels may not be used. Hooks baited with 0.25 lb chum salmon. No setting before 5AM to ensure daylight. Soak time: 5 hrs	1	110 total for GOARA, BSAIRA and West Coast	Up to 1500 sets total for GOARA, BSAIRA and West Coast stations	1	110	Up to 1500 sets total for GOARA, BSAIRA and West Coast stations	-	-	-	1	110 total for GOARA, BSAIRA and West Coast	Up to 1500 sets total for GOARA, BSAIRA and West Coast stations
Snap Gear Longline (IPHC only)	Hooks are attached to the long line by snaps.	1	10	Up to 20	-	-	-	-	-	-	-	-	-
Rod and Reel	4 rod and reel herring type jig fishing 3-4 2/0 hooks per jigging rig, with 3-4-oz bank sinkers. Squid is the bait.	1	4	Up to 16	-	-	-	-	-	-	-	-	-
Bottom Trawl Gear													
Beam Trawl	Net type: beam trawl Net size: up to 2 m, 3-7 mm mesh, 4 mm cod end liner Tow speed: 1-2 kts. Tow duration: 3-10 minutes (min.) Depth: 18-200 m.	3	92	Up to 150	3	105	Up to 185	1	28	Up to 50	-	-	-
Plumb Staff Beam Trawl	Net size: up to 3 m wide. Tow speed: 1.5-3 kts. Depth: 5-100 m. Tow duration: 3-30 minutes.	-	-	-	-	-	-	1	30	Up to 40	-	-	-
Poly Nor'Eastern Trawl	Net size: footrope up to 27 m, headrope up to 30 m. Tow speed: 2.5-5 kts. Depth: 50-1,200 m. Duration 10-30 minutes. Marport headrope and wing sounders, 40 kHz	5	272	Up to 1300	6	245	Up to 855 tows Plus 200 grab samples	-	-	-	-	-	-

Gear Type	General Gear Description	Gulf of Alaska Research Area Research Area (GOARA)			Bering Sea/Aleutian Islands Research Area (BSAIRA)			Chukchi Sea/Beaufort Sea Research Area (CSBSRA)			IPHC Research		
		Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort (tows/samples)	Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort (tows/ samples)	Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort	Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort
Eastern Otter Trawl	Net size: 83 ft headrope, 112 ft footrope. Tow speed: 3 kts. Tow duration: 15-30 minutes. Depth: 10-200 m. Marport headrope and wing sounders, 40 kHz.	-	-	-	1	75	Up to 376	1	30	Up to 143	-	-	-
Commercial Bottom Trawl	Net size: Operating net width 18-24 m, height 4-8 m. Mesh size 8 in (forward sections) to 5.5-4 in (aft sections). Footropes large bobbins or disks (18-24 in diameter) with 18-48 in spacing between Tow speed: 3-3.5 kts Tow duration: Experimental tows - 0.75-6.5 hrs. Depth: 66-154 m Marport headrope and wing sounders, 40 kHz	1	7	Up to 40	1	7	Up to 90	-	-	-	-	-	-
Nephrops Trawl	A fishing industry bottom trawl that is towed on the seabed, with the mouth held open by a pair of otter boards (trawl doors). It's designed and rigged to be towed over rough seabeds to target nephrops.	1	100	Up to 50	-	-	-	-	-	-	-	-	-
Midwater, Surface, and Shallow Water Trawl Gear													
Commercial Midwater Trawl	Net size: Operating net width 75-136 m, height 10-20 m, with size highly dependent on vessel power. Very large meshes (128-64 m) forward tapering gradually to 4 in in aft sections Tow speed: 3-3.5 kts Tow duration: Experimental tows - 0.75-3 hrs Depth: 66-154 m	1	7	Up to 40	1	7	Up to 90	-	-	-	-	-	-
Aleutian Wing Trawl	Net size: headrope/foot rope = 82 m. Vertical opening 27m, codend liners 1.25 centimeters (cm). Tow speed: 3 kts. Depth: 50-600 m. Tow duration: 10 minutes to 1 hr. With 40 hertz (Hz) door sensors and Simrad FS70.	3	122	Up to 140	2	93	Up to 260	-	-	-	-	-	-
Anchovy Trawl	Net size: 12 m x 12 m, 3 mm cod end liner. Tow speed: 2-3 kts. Tow duration: depth dependent, up to 1 hr. Depth: oblique to bottom (<200m)	1	35	Up to 75	2	80	Up to 95	-	-	-	-	-	-
Methot or Similar Small Midwater Trawl	Tow speed: 3 kts Tow duration: up to 1 hr Depth: 50-600 m	1	60	Up to 10	-	-	-	-	-	-	-	-	-
Eastern Otter Trawl	Bottom trawl fished as midwater trawl.	-	-	-	1	75	Up to 25 per vessel	-	-	-	-	-	-
Nordic 264 Trawl	Net size: 20 m x 20 m. Tow speed: 3 kts. Depth: surface to 20 m. Duration: 20 minutes.	1	28	Up to 48	1	50	Up to 75	-	-	-	-	-	-
Cantrawl	Net size: 55 m width, 25 m depth. Tow speed: 3 to 5 kts. Depth: surface to 25 m Tow duration: 30 minutes	-	-	-	1	25	Up to 110	-	-	-	-	-	-

Gear Type	General Gear Description	Gulf of Alaska Research Area (GOARA)			Bering Sea/Aleutian Islands Research Area (BSAIRA)			Chukchi Sea/Beaufort Sea Research Area (CSBSRA)			IPHC Research		
		Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort (tows/samples)	Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort (tows/ samples)	Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort	Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort
Other Gear Types													
Beach Seine	Deployed in shallow water from shore by crews in small boats. Net size: 5 - 61 m long. Mesh size: 0.3 - 7 cm. Set duration: 10 - 30 minutes.	3	365	Up to 300	-	-	-	-	-	-	-	-	-
Fyke Net	Fyke net size: 12 m long. Mesh size: 1.3 cm. Set duration: 4 hrs. Freshwater only.	1	365	Up to 20 sets	-	-	-	-	-	-	-	-	-
Cast, Hoop, Dip, and Multiple Open/Close Nets	Surface cast net size: 3.7 m diameter. Mesh size: 10 - 20 mm. Dip, and hoop nets are small hand nets used to collect crustaceans' larvae and small fish.	2	365	>170 casts	1	25	Up to 48 stations	-	-	-	-	-	-
Gillnet	4.5-inch mesh size with pingers	1	365	Up to 50	-	-	-	-	-	-	-	-	-
Bongo Net - Tandem	Net size: 60 cm each ring (mesh 505 µm; 333 µm) Tow speed: 1 kts. Tow duration: 15 - 45 min Depth: 1 – 200 m	3	94	Up to 415	-	-	-	-	-	-	-	-	-
Bongo Net – Zooplankton	Net size: 505 µm and 143 µm mesh Tow speed: 1 m/sec. Tow duration: depends on depth Depth: surface to 1 m off bottom	-	-	-	1	25	Up to 200	-	-	-	-	-	-
Bongo Net -Plankton	Net size: 20 cm and 60 cm Tow speed: 1.5 – 2.5 kts. Tow duration: 10 – 30 min Depth: 0 – 300 m	1	31	Up to 150	4	142	Up to 525	1	28	Up to 50	-	-	-
Neuston Net	Net size: 0.25 m^2. Tow speed: 1 – 3 kts. Tow duration: 10 min. Depth: surface				1	31	Up to 150	-	-	-	-	-	-
Pot Gear including "Slinky" Pots	Pots of various sizes constructed of rebar and webbing or plywood and plastic. Bait: fish or squid. Soak time: 3 days to 3 months. Slinky pots are collapsible, lightweight mesh pots filled with bait, attached to a long line, and set at the bottom	1	14	Up to 1,680 pots total	3	68	Up to 2,560 pots total	1	14	Up to 1,680 pots total	-	-	-
Net Pens and Fish traps	Pens at Little port Walter Research Station and Experimental Hatchery and Alaska Aquaculture Research (10 x 10 ft or 20 x 20 ft pens with ~1-inch mesh size). Fish trap at Auke Creek	3	365	2 pens 1 trap	-	-	-	-	-	-	-	-	-
Settlement Plates	Deep Sea coral funded project to study reproduction and coral recruitment in SE Alaska	1	2	3 plates	-	-	-	-	-	-	-	-	-

Gear Type	General Gear Description	Gulf of Alaska Research Area (GOARA)			Bering Sea/Aleutian Islands Research Area (BSAIRA)			Chukchi Sea/Beaufort Sea Research Area (CSBSRA)			IPHC Research		
		Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort (tows/samples)	Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort (tows/ samples)	Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort	Estimated Number of Projects	Estimated Annual Maximum DAS	Estimated Annual Level of Effort
Bottom Sampler and Penetrometer	Benthic samplers are used to collect sediment and associated benthic invertebrate samples. Depths <200 m. Penetrometers are dropped from stationary or underway vessel to seafloor with < 3 m penetration	2	40	110 bottom samples 92 penetrometer stations	1	20	50 bottom samples 92 penetrometer stations	-	-	-	-	-	-
Video or Still Cameras	Cameras attached to nets or trawls or towed by sleds. Includes baited camera traps handheld cameras, and cameras on UxS	4	122	20 towed 540 baited 6 handheld 3 UxS	2	45	20 towed 48 handheld	-	-	-	-	-	-
Echosounders and Side Scan Sonar	Scientific single beam (38 kHz) and multibeam echosounders (50, 100 kHz); side-scan sonar (180,455 kHz), EK80 split-beam echosounders, and low-power Simrad WBAT stationary, upward looking moored echosounders 38, 70, or 200 kHz	3	365	5500 linear km, 50% of MACE acoustic trawls, and up to 12 moored locations (continuous; 3-6 min. per hr)	3	365	5700 linear km EBS (NBS TBD), 50% of MACE acoustic trawls, and up to 12 moored locations (continuous; 3-6 min. per hr)	2	365	50% of MACE acoustic trawls and up to 12 moored locations (continuous; 3-6 min. per hr))	-	-	-
Uncrewed Systems (UxS)	May include USVs such DriX; and wind-powered Saildrones, AUVs and Uncrewed Aerial Systems (UAS)	2	72	50% of line transects of MACE Acoustic trawl activities; plus locating 3 coral settlement plates	1	70	50% of line transects of MACE Acoustic trawl activities	1	70	50% of line transects of MACE Acoustic trawl activities	-	-	-
SCUBA and Snorkel	Human divers collect invertebrates and benthic samples and/or video/photograph habitat	5	>30	>75	1	25	Up to 48 stations	-	-	-	-	-	-
Shoreline Transects	Transect tape along shoreline swaths. 2 x 20 m transects on beaches around Juneau	1	10	10	-	-	-	-	-	-	-	-	-
Weirs	Weirs across Sashin Creek (Little Port Walter) and Auke Creek (with fish trap)	2	365	`	-	`	A	-	-	-	-	-	-

2. DATES, DURATION, AND REGION OF ACTIVITY

2.1. Dates and Durations of Activities

Fisheries and ecosystem research conducted and funded by AFSC and IPHC is proposed for the period 2024–2029 as described in this application. While the surveys shown in Table 1-1 are planned over the next 5-year period, not every survey may occur each year. The number and extent of surveys depends on available funding and other factors, which is subject to change from year to year. However, for this LOA application, information on the types of surveys (*i.e.*, description), area of operation, season/frequency, gear used, and level of effort such as number of tows or sets is provided in Table 1-1 for the full suite of activities that may occur during the 5-year period 2024–2029 by both AFSC and IPHC. This precautionary approach allows AFSC to estimate the potential for interacting with marine mammals during this period and to calculate potential takes as described in Section 6 of this application. As described in Section 5, AFSC is only requesting takes for non-lethal Level A harassment, M/SI due to potential entanglement or hooking, etc., and Level B harassment due to physical disturbance.

2.2. Region of Activity

As shown in Figures 1-1 and 1-2, and described in Section 1.1, AFSC and IPHC conduct research in three areas in Alaskan waters (GOARA, BSAIRA and CSBSRA) and in coastal waters of Washington, Oregon and Northern California.

3. SPECIES AND NUMBERS OF MARINE MAMMALS IN THE ACTION AREAS

Table 3-1 lists the NMFS-managed marine mammal species and the regions where they may be encountered. The table also shows the abundance used in the 2019 final rule and the most recently available abundance estimates. Only marine mammal species for which non-lethal injury, M/SI due to potential entanglement or physical disturbance takes are requested are shown in the table.

The 2019 final rule (84 Federal Register [FR] 46788) included abundances for the following non-Endangered Species Act (ESA)-listed marine mammals that occur off the U.S. west coast (not in Alaska waters), but no takes were requested for these species. These stocks are not shown in Table 3-1 and are not discussed further because interactions with IPHC research in west coast waters are not expected. See the 2019 final rule for additional details:

- Pygmy sperm whale – CA/OR/WA stock
- Dwarf sperm whale – CA/OR/WA stock
- Common bottlenose dolphin – California coastal stock (CA/OR/WA offshore stock is included)
- Striped dolphin – CA/OR/WA stock
- Long-beaked common dolphin – CA/OR/WA stock
- Harbor porpoise – Morro Bay, Monterey Bay, San Francisco-Russian River, Northern CA/Southern OR, N. Oregon/WA Coast, and Washington Inland Waters stocks (SE Alaska, GOA, and Bering Sea stocks are included).

In addition, only non-listed gray whales from the Eastern North Pacific (ENP) stock are included in this application (see Section 4.2.10). As per the 2019 final rule (84 FR 46788) and 2019 Biological Opinion (BiOp) (NMFS 2019a), ESA-listed gray whales from the Western North Pacific stock are considered to be extralimital in the action area and would not be impacted by research activities in those areas. They are not discussed further in this SPEA.

Table 3-1. Marine Mammal Species Managed by NMFS In AFSC and IPHC Research Areas

Species and Stock or Distinct Population Segment (DPS)	GOARA	BSAIRA	CSBSRA	U.S. West Coast[1]	2019 Final Rule Abundance [2]	Current Estimated Abundance [3]
ESA-listed Marine Mammal Species or DPSs						
Sperm Whale *(Physeter microcephalus)* ENP Stock CA/OR/WA Stock	 X	 X	 	 X	 Unknown 1,997	 Unknown[4] 1,997
Humpback Whale[5] *(Megaptera novaeangliae)* Mexico DPS – Mexico/N. Pacific Stock Western N. Pacific Stock Central America/S. Mexico DPS - CA/OR/WA Stock Mainland Mexico DPS -CA/OR/WA Stock	 X	 X X	 X	 X X	 NR 1,107 2.900 NR	 918 1,084 1,496 3,477
Blue Whale *(Balaenoptera musculus musculus)* ENP Stock	 X	 X	 	 X	 1,647	 1,898
Fin Whale *(Balaenoptera physalus velifera)* NE Pacific Stock CA/OR/WA Stock	 X	 X	 X	 X X	 Unknown 9,029	 3,168 11,065
Sei Whale *(Balaenoptera borealis borealis)* ENP Stock	 X	 X	 	 X	 519 (CA/OR/WA waters only	 519 (CA/OR/WA waters only) 29,632 (not including CA/WA/OR)
Bowhead Whale *(Balaena mysticetus*) Western Arctic Stock	 	 X	 X	 	 16,820	 14,025
Beluga Whale (*Delphinapterus leucas*) Cook Inlet DPS	 X	 	 	 	 327	 331[6]
Killer Whale *(Orcinus orca)* ENP Southern Resident (SRKW) Stock	 	 	 	 X	 83	 74
North Pacific Right Whale (*Eubalaena japonica*) ENP Stock	 X	 X	 	 	 31	 31

Species and Stock or Distinct Population Segment (DPS)	GOAR A	BSAIR A	CSBSR A	U.S. West Coast[1]	2019 Final Rule Abundance [2]	Current Estimated Abundance [3]
Ringed Seal (*Phoca hispida*) Arctic Subspecies		X	X		Unknown	171,418[7]
Bearded seal (*Erignathus barbatus nauticus*) Beringia DPS		X	X		273,676	301,830[7]
Steller Sea Lion (*Eumetopias jubatus*) Western U.S. DPS	X	X			54,267	52,932
Guadalupe Fur Seal *(Arctocephalus townsendi)*				X	20,000	34,187
Non-ESA-listed Marine Mammal Species						
Harbor Porpoise *(Phocoena phocoena)*						
SE Alaska Stock[8]	X				Unknown	Unknown
GOA Stock	X				31,046	31,046
Bering Sea Stock		X	X		48,215	Unknown[9]
Dall's Porpoise *(Phocoenoides dalli)*						
Alaska Stock	X	X			83,400	Unknown
CA/OR/WA Stock				X	25,750	16,498
Pacific White-Sided Dolphin *(Lagenorhynchus obliquidens)*						
North Pacific Stock	X	X			26,880	26,880
CA/OR/WA Stock				X	26,814	34,999
Risso's Dolphin *(Grampus griseus)* CA/OR/WA Stock				X	6,336	6,336
Common Bottlenose Dolphin *(Tursiops truncates truncates)* CA/OR/WA Offshore Stock				X	1,924	3,477
Common Dolphin *(Delphinus delphis delphis)* CA/OR/WA stock				X	969,861	1,056,308
Northern Right Whale Dolphin *(Lissodelphis borealis)* CA/OR/WA Stock				X	26,556	29,285
Beluga Whale (*Delphinapterus leucas*)						
Beaufort Sea		X	X		39,258	39,258
Eastern Chukchi Sea		X	X		20,752	13,305
Eastern Bering Sea		X			6,994	12,269
Bristol Bay		X			1,926	2,040
Humpback Whale[5] *(Megaptera novaeangliae)* Hawaii DPS				X	NR	11,278

Species and Stock or Distinct Population Segment (DPS)	GOARA	BSAIRA	CSBSRA	U.S. West Coast[1]	2019 Final Rule Abundance [2]	Current Estimated Abundance [3]
Gray Whale *(Eschrichtius robustus)* ENP Stock[10]	X	X	X	X	26,960	26,960
Killer Whale *(Orsinus orca)*						
ENP Northern Resident	X			X	261	302
West Coast Transient	X			X	243	349
ENP Offshore Stock	X	X		X	300	300
AT1 Transient[11]	X				7	7
ENP GOA, AI and BS Transient	X	X	X		587	587
ENP Alaska Resident	X	X			2,347	1,920
Short-finned Pilot Whale *(Globicephala macrorhynchus)* CA/OR/WA Stock				X	836	836
Baird's Beaked Whale *(Berardius bairdii)*						
Alaska Stock	X	X			Unknown	Unknown
CA/OR/WA Stock				X	2,697	1,363
Cuvier's Beaked Whale *(Ziphius cavirostris)*						
Alaska Stock	X	X			Unknown	Unknown
CA/OR/WA Stock				X	3,274	5,454
Other Beaked Whales[12] *Mesoplodon spp.*				X	3,044	3,044
Minke Whale *(Balaenoptera acutorostrata)*						
Alaska Stock	X	X	X		Unknown	Unknown
CA/OR/WA Stock				X	636	915
California Sea Lion *(Zalophus californianus)*	X			X	267,750	257,606
Steller Sea Lion *(Eumetopias jubatus monteriensis)* Eastern DPS	X			X	41,638	43,201
Northern Fur Seal *(Callorhinus ursinus)*						
Pribilofs/Eastern Pacific Stock	X	X			237,561	626,618
California Stock	X			X	14,050	14,050
Northern Elephant Seal *(Mirounga angustirostris)* California Breeding Stock	X	X		X	179,000	187,386
Harbor Seal *(Phoca vitulina richardsii)*						
California Stock[13]				X	30,968	30,968
OR/WA Coast Stock[13]				X	24,732	24,732
WA Inland Waters Stock[13]				X	11,036	11,036

Species and Stock or Distinct Population Segment (DPS)	GOAR A	BSAIR A	CSBSR A	U.S. West Coast[1]	2019 Final Rule Abundance [2]	Current Estimated Abundance [3]
Southern Puget Sound Stock[13]				X	1,568	1,568
Hood Canal Stock[13]				X	1,088	1,088
Clarence Strait Stock	X				31,634	27,659
Dixon/Cape Decision Stock	X				18,105	23,478
Sitka/Chatham Strait Stock	X				14,855	13,289
Lynn Canal/Stephens Passage Stock	X				9,478	13,388
Glacier Bay/Icy Strait Stock	X				7,210	7,455
Cook Inlet/Shelikof Strait Stock	X				27,386	28,411
Prince William Sound Stock	X				29,889	44,756
South Kodiak Stock	X				19,199	26,448
North Kodiak Stock	X				8,321	8,677
Bristol Bay Stock		X			32,350	44,781
Pribilof Islands Stock		X			232	229
Aleutian Islands Stock		X			6,431	5,588
Spotted Seal (*Phoca largha*) Bering Alaska		X	X		461,625	461,625
Ribbon Seal (*Histriophoca fasciata*) U.S.		X	X		184,000	184,697

NR = Not reported. NA = not available.

[1]May overlap with IPHC research off of Washington, Oregon and N. California.

[2]2019 Abundance taken from 84 FR 46788.

[3]Sources: Carretta *et al.* (2023), Young *et al.* (2023).

[4]From Young *et al.* (2023).

[5]Stock definitions were revised in 2023 (Carretta *et al.* 2023, Young *et al.* 2023).

[6]Current Cook Inlet beluga abundance is calculated based on video and counting passes conducted in June of 2021 and 2022. See Goetz *et al.* (2023).

[7]U.S. Bering Sea waters only. This estimate is considered to be low by a factor of 2 or more due to seals in the water not being accounted for and the estimate did not include seals in the shorefast ice zone (Young *et al.* 2023).

[8]In 2022, the Southeast Alaska stock was divided into three separate stocks: the Northern Southeast Alaska Inland Waters; the Southern Southeast Alaska Inland Waters; and the Yakutat/Southeast Alaska Offshore Waters. Abundances for two of these stocks are known, but surveys are over 8 years old (See Section 4.2.1). For details on the stock structure and abundances see Young *et al.* (2023).

[9]This estimate from 1999 is conservative, as the surveyed areas did not include known harbor porpoise range along the Aleutian Island chain, near the Pribilof Islands, or in the waters north of Cape Newenham (Young *et al.* 2023).

[10]ENP gray whales experienced an unusual mortality event (UME) beginning in 2019 (which is ongoing). https://www.fisheries.noaa.gov/national/marine-life-distress/2019-2023-gray-whale-unusual-mortality-event-along-west-coast-and (Accessed June 13, 2023). Necropsies conducted on a subset of stranded whales indicated that many animals showed evidence of nutritional stress.

[11]There has been no recruitment in this population since 1984 (Matkin *et al.* 2012; as cited in Young *et al.* (2023).

[12]*Mesoplodon spp*. Species are managed as a single stock due to difficulty in distinguishing among them.

[13]These stocks are included because IPHC takes could be from any harbor seal stock (84 FR 76788).

4. AFFECTED SPECIES STATUS AND DISTRIBUTION

The following subsections provide detailed information on life histories for the ESA-listed and non-listed marine mammal species managed by NMFS that may be taken during AFSC and IPHC research activities. See Table 3-1 for species names and research area where they might be encountered during AFSC and IPHC research activities.

4.1. ESA-Listed Marine Mammal Species or DPSs

4.1.1. Sperm Whales

Description: The sperm whale is the largest toothed whale species and the most sexually dimorphic cetacean in body length and weight (Rice *et al.* 1984, Whitehead 2009). Adult females can reach 12 m in length, while adult males measure as much as 18 m in length (Jefferson *et al.* 2015). The head is large (comprising about one-third of the body length) and squarish. The lower jaw is narrow and under slung. The blowhole is located at the front of the head and is offset to the left. Sperm whales are brownish gray to black in color with white areas around the mouth and often on the belly. The flippers are relatively short, wide, and paddle-shaped. There is a low rounded dorsal hump and a series of bumps on the dorsal ridge of the tailstock and the surface of the body behind the head tends to be wrinkled (Jefferson *et al.* 2015).

Status and Trends: Sperm whales are formally listed as endangered under the ESA, and consequently the species is automatically considered as depleted and strategic under the MMPA. Estimates of ENP sperm whale abundance were 3,140 (coefficient of variation [CV]=0.40) in 2005 but only 300 (CV=0.51) in 2008; this 10-fold difference is likely due to study design (Carretta *et al.* 2023). The data used in estimating the abundance of sperm whales in the entire North Pacific are more than 8 years old; therefore a reliable estimate of abundance for the ENP stock is considered unavailable and Potential Biological Removal (PBR)[2] is undetermined (Carretta *et al.* 2023).

The current best estimate of CA/OR/WA sperm whale abundance based on the most recent survey (2014) is 1,997 (CV= 0.57) animals (Carretta *et al.* 2023). This estimate is corrected for diving animals not seen during surveys. The minimum population estimate is 1,270 whales and the PBR is 2.5 whales per year (Carretta *et al.* 2023).

Whaling removed at least 436,000 sperm whales from the North Pacific between 1800 and the end of commercial whaling (Carretta *et al.* 2023). There has been a prohibition on taking sperm whales in the North Pacific since 1988, but large-scale pelagic whaling stopped in 1980. Moore and Barlow (2017; as cited in (Carretta *et al.* 2023) reported that sperm whale abundance appeared stable from 1991 to 2008 and additional data from a 2014 survey does not change that conclusion.

Distribution and Habitat Preferences: With the exception of humans and killer whales, few animals on earth are as widely distributed as sperm whales (Whitehead 2009). As summarized in Carretta *et al.*

[2] Potential Biological Removal (PBR) is defined by the MMPA as the maximum number of animals, not including natural mortalities, which may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. The PBR level is the product of the minimum population estimate of the stock; one-half the maximum theoretical or estimated net productivity rate of the stock at a small population size; and a recovery factor of between 0.1 and 1.0.

(2023), sperm whales are widely distributed across the entire North Pacific and into the southern Bering Sea in summer but the majority are thought to be south of 40° N in winter. Sperm whales are found year-round in West coast U.S. waters but they reach peak abundance from April through mid-June and from the end of August through mid-November. They were seen in every season except winter (Dec.-Feb.) in Washington and Oregon. Of 176 sperm whales that were marked with Discovery tags off southern California in winter 1962-70, only three were recovered by whalers: one off northern California in June, one off Washington in June, and another far off British Columbia in April. Recent summer/fall surveys in the eastern tropical Pacific show that although sperm whales are widely distributed in the tropics, their relative abundance tapers off markedly westward towards the middle of the tropical Pacific and tapers off northward towards the tip of Baja California. Critical habitat has not been designated for sperm whales.

Behavior and Life History: Females reach sexual maturity at about age 9 when roughly 9 m long and they give birth about every 5 years; gestation is 14-16 months (Whitehead 2009). Males are larger during the first 10 years and continue to grow well into their 30s, finally reaching physical maturity at about 16 m. The sperm whale consumes numerous varieties of deep-water fish and cephalopods. Sperm whales forage during deep dives that routinely exceed a depth of 400 m and duration of 30 mins. They are capable of diving to depths of over 2,000 m with durations of over 60 min. Sperm whales spend up to 83 percent (%) of daylight hours underwater. Males do not spend extensive periods of time at the surface. In contrast, females spend prolonged periods of time at the surface (1 to 5 hrs daily) without foraging (Whitehead 2009). An average dive cycle consists of about a 45 min dive with a 9-minute surface interval. The average swimming speed is estimated to be 2.5 km/hr (Whitehead 2009).

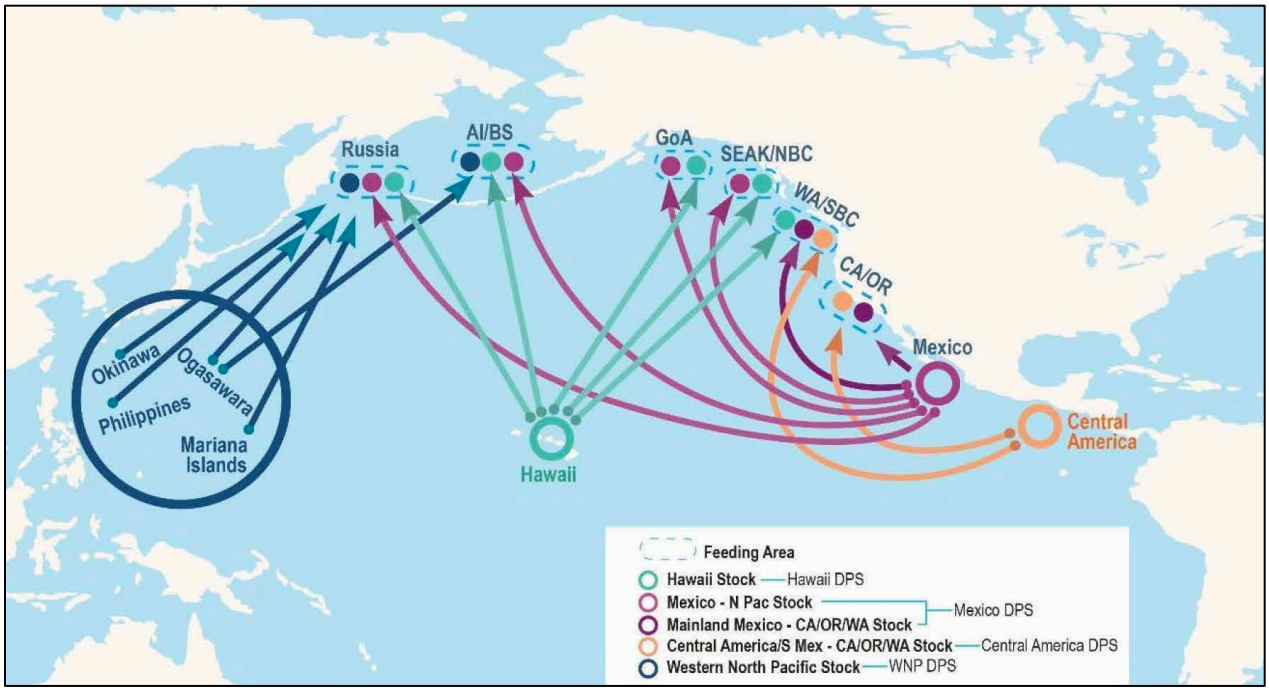
4.1.2. Humpback Whales

Description: As summarized by Clapham (2009) and citations therein, humpback whales are large baleen whales with females slightly larger than males. Adult lengths are 16-17 m and calves are about 4 m. Humpback whales are easily recognized at close range by their extremely long flippers, which may be one-third the length of the body. The flippers are white on the bottom and may be white or black on top, depending on the population. The body is black on top with variable coloration ventrally and on the sides. The head and jaws have numerous knobs that are diagnostic for the species. The dorsal fin is small and variable in shape. The underside of the tail exhibits a pattern of white to black that is individually identifiable. The baleen is primarily black and occurs in 270-400 plates on each side of the mouth (Clapham 2009).

Changes to Stock Definitions: On September 8, 2016, NMFS issued a final rule which revised the global listing status of the humpback whale by dividing the species into 14 distinct DPSs (81 FR 62260). In 2022, NMFS further refined humpback whale stock structure based on feeding area and migratory routes, and recognized 4 DPSs in the North Pacific: the Western north Pacific DPS (endangered); the Mexico DPS (threatened;) the Central America DPS (endangered); and the Hawaii DPS (not-listed under the ESA) (Carretta *et al.* 2023, Young *et al.* 2023). In prior stock assessments, NMFS had designated three stocks of humpback whales in the North Pacific: the California/Oregon/Washington (CA/OR/WA) stock; the Central North Pacific stock; and the Western North Pacific stock. These stocks were not necessarily aligned with the ESA DPSs because some were composed of whales from more than one DPS, which led NMFS to reevaluate stock structure under the MMPA (Carretta *et al.* 2023, Young *et al.* 2023).

Individuals from the Central America DPS and Hawaii DPS feed within potential IPHC research areas. Individuals from the CA/OR/WA stock, Mexico DPS and Hawaii DPS migrate to the GOARA and BSAIRA (Figure 4-1). On April 21, 2021, NMFS designated critical habitat for 3 ESA-listed DPSs of humpback whales (86 FR 21082): the endangered Western North Pacific DPS; the threatened Mexico DPS; and the endangered Central America DPS. See Section 9.3.1 for a discussion of humpback whale critical habitat.

Figure 4-1. North Pacific Humpback Whale Stocks



Source: Carretta *et al.* (2023), Young *et al.* (2023).

Status and Trends: Of the humpback whale stocks that may be encountered by AFSC and IPHC research activities, four are listed as threatened or endangered under the ESA: Mexico DPS-Mexico/N. Pacific Stock (threatened); western N. Pacific Stock (endangered); Central America/S. Mexico DPS-CA/OR/WA Stock (threatened) and the Mainland Mexico DPS -CA/OR/WA Stock (threatened). Humpback whales form the non-ESA-listed Hawaii DPS may also be encountered. This DPS is discussed in Section 4.2.9.

Mexico DPS – Mexico/N. Pacific Stock - Wade (2021; as cited in (Young *et al.* 2023) conducted multi-strata analysis of 2004-2006 SPLASH data and estimated the population of this stock to be 918 animals (CV=0.217). However, the data used for this estimate is more than 8 years old, and thus the N_{MIN} estimate of the stock should be considered unknown (NMFS 2016a). Because N_{MIN} is considered unknown, PBR is undetermined.

Whales in this stock migrate to the Aleutian Islands, Bering Sea, and GOA. There are no trend data for humpback whales in the Aleutian Islands and Bering Sea (Young *et al.* 2023). For shelf waters of the northern GOA, Zerbini *et al.* (2006) estimated an annual rate of increase for humpback whales of 6.6%

(95% CI:5.2-8.6%) from 1987 to 2003. Teerlink *et al*. (2015; as cited (Young *et al.* 2023) estimated an average annual rate of increase of 4.53% (95 % CI 3.28–5.79%) over the period 1978-2009 for humpback whales in Prince William Sound. These areas include a mixture of whales from Hawaii, Mexico, and Asia and do not reflect the trend of a single stock; therefore it is unknown if this population is currently increasing (Young *et al.* 2023).

Western N. Pacific Stock - Wade *et al*. (2016) and Wade (2021); as cited in Young *et al.* (2023) conducted a comprehensive reanalysis of the SPLASH data using a multi-strata analysis and estimated a population for "Asia" of 1,084 (CV = 0.088) for 2004-2006. SPLASH did not include sampling in the Mariana Archipelago, such that this estimate is likely an underestimate of total population size for this stock. The data is more than 8 years old, and the N_{MIN} estimate of the stock should be considered unknown (NMFS 2016a). Because N_{MIN} is considered unknown, PBR is undetermined.

The SPLASH abundance estimate for "Asia" represents a 6.7% annual rate of increase over an abundance estimate from 1991-1993 (Calambokidis *et al.* 2008). This increase is likely too great to reflect population growth alone, and may include whales from other regions that were not surveyed during SPLASH. The annual rate of increase for the this stock is unknown; while it was previously assumed to be increasing, assessments using more recent datasets will be required to assess the current trend (Calambokidis *et al.* 2008).

Central America/S. Mexico DPS-CA/OR/WA Stock - As summarized in Carretta *et al.* (2023), Curtis *et al*. (2022) used photographic data collected between 2019 and 2021 to estimate the abundance for this stock as 1,496 (CV=0.171) individuals. This represents the best estimate of abundance for the Central America / Southern Mexico - CA-OR-WA stock of humpback whales, and is approximately double the estimate derived from 2004-06 data, even though the 2004-2006 data do not include whales from southern Mexico (Carretta *et al.* 2023). If the increase was due purely to population growth, it would suggest an annual growth rate of approximately 4.7% (Curtis et al. 2022; as cited in (Carretta *et al.* 2023), which is lower than the 8.2% annual increase observed for all humpback whales off the U.S. west coast since the late 1980s (Calambokidis and Barlow 2020). Given the inclusion of whales from southern Mexico in the current estimate, Curtis *et al.* (2022; as cited in (Carretta *et al.* 2023) derived an annual population growth rate for the Central America/Southern Mexico DPS by excluding whales in southern Mexico waters in the spatial recapture model based on differences between the 2004-2006 estimate and the current estimate. This yields an annual growth rate of 1.8% (SD = 2.3%) for the Central America/Southern Mexico - CA/OR/WA stock of humpback whales; however, as evidenced by the SD, the estimate has high uncertainty (Carretta *et al.* 2023). PBR for the stock is 5.2. The total PBR for this stock (5.2) is prorated by ⅔, to yield a PBR in U.S. waters of 3.5 whales per year (Carretta *et al.* 2023).

Mainland Mexico DPS – CA/OR/WA Stock - Curtis *et al*. (2022; as cited in (Carretta *et al.* 2023) estimated the abundance of whales from the Mainland Mexico DPS – CA/OR/WA Stock as 3,477 animals (CV=0.099). Even though this may be an underestimate because the total abundance estimate provided in Calambokidis and Barlow, Calambokidis and Barlow (2020) did not include photo identification off Washington state, it is considered to be the best estimate of abundance for the Mainland Mexico – CA-OR-WA stock of humpback whales. A stock-specific population trend for the Mainland Mexico – CA-OR-WA stock of humpbacks has not yet been estimated (Carretta *et al.* 2023). The total PBR for this stock (65) is prorated by ⅔, to yield a PBR in U.S. waters of 43.

Distribution and Habitat Preferences: Humpback whales are found in all oceans of the world and are highly migratory from high latitude feeding grounds to low latitude calving areas. They are typically found in coastal or shelf waters in summer and close to islands and reef systems in winter (Clapham 2009). As shown in Figure 4-1, the primary wintering areas of the Central America/Southern Mexico-CA/OR/WA stock include the Pacific coasts of Nicaragua, Honduras, El Salvador, Guatemala, Panama, Costa Rica. Primary summering areas for whales from this stock include the California and Oregon coasts, with a few individuals possible off of northern Washington/southern British Columbia. The primary wintering areas of the Mainland Mexico – CA/OR/WA stock include the mainland Mexico states of Nayarit and Jalisco, with some animals seen as far south as Colima and Michoacán. Summer feeding destinations for whales in this stock include waters of off California, Oregon, Washington, Southern British Columbia, Alaska, and the Bering Sea. See section 9.3 for a discussion of humpback whale critical habitat.

Behavior and Life History: Humpback whales are known for their aerial behaviors and complex songs. They breed in warm tropical waters after an 11-month gestation period; calves likely feed independently after 6 months. Humpback whales feed on euphausiids and various schooling fishes, including herring, capelin, sand lance, and mackerel (Clapham 2009). Although humpback whales have been recorded to dive as deep as about 500 m, on the feeding grounds they spend the majority of their time in the upper 122 m of the water column. On the wintering grounds they dive deeper to 176 m or greater. Like other large mysticetes, they are "lunge feeders" taking advantage of dense prey patches and engulfing as much food as possible in a single gulp (Clapham 2009). They also blow nets, or curtains, of bubbles around or below prey patches to concentrate the prey in one area, then lunge with mouths open through the middle (Clapham 2009).

4.1.3. Blue Whales

Description: The blue whale is the largest animal to have ever existed on earth and is found world-wide ranging into all oceans. The largest recorded blue whale from the northern hemisphere was a 28.1 m female; females tend to be larger than males, and southern hemisphere blue whales are larger than those in the north (Sears and Perrin 2009). They have a tapered, elongated shape with a huge broad, relatively flat, U-shaped head. The baleen is black. The dorsal fin is proportionately smaller than in other baleen whales and varied in shape, ranging from a small nubbin to triangular and falcate positioned far back on the body. Underwater they are slate blue; above water, they appear mottled light and dark shades of gray.

Status and Trends: Blue whales are formally listed as endangered under the ESA, and are considered as a depleted and strategic stock under the MMPA. The size of the feeding stock of blue whales off the U.S. West Coast has been estimated by line-transect and mark-recapture methods. Because some fraction of the population is always outside the survey area, the line-transect and mark recapture estimation methods provide different measures of abundance for this stock (Carretta *et al.* 2023).

Abundance estimates calculated from line-transect surveys are highly-variable due to the northward distributional shifts of blue whales out of U.S. waters linked to warming ocean temperatures (Barlow and Forney 2007, Calambokidis *et al.* 2009, Barlow 2010; 2016 as cited in (Carretta *et al.* 2023). This is shown by increasing numbers of blue whales found in Oregon and Washington waters during a 1996-

2014 line-transect surveys (Barlow 2016) and satellite tracks of blue whales in GOA and Canadian waters between 1994 and 2007 (Bailey *et al.* 2009; as cited in (Carretta *et al.* 2023).

An analysis of line-transect survey data from 1996-2014 provided a range of blue whale estimates from a high of approximately 2,900 whales in 1996 to a low of 900 whales in 2008 (Barlow 2016). Using updated photographic data from 2018, Calambokidis and Barlow (2020) determined the best estimate of current abundance for this stock is 1,898 (CV=0.085) whales (Carretta *et al.* 2023). PBR is 7 whales but since most blue whales are outside U.S. waters from November to March (5 months), PBR for U.S. waters is 7/12 of the total PBR, or 4.1 whales per year.

Distribution and Habitat Preferences: The blue whale has a worldwide distribution in circumpolar and temperate waters. The ENP Stock of blue whales includes animals found in the ENP from the northern GOA to the eastern tropical Pacific Based on locations where the northeastern call type has been recorded, some individuals in this stock may range as far west as Wake Island and as far south as the Equator. However, most of this stock is believed to migrate south to spend the winter and spring in high productivity areas off Baja California, in the Gulf of California, and on the Costa Rica Dome (Carretta *et al.* 2023). Critical habitat for blue whales has not been designated.

Behavior and Life History: Blue whales reach sexual maturity at 5-15 years of age; length at sexual maturity in the Northern Hemisphere for females is 21-23 m and for males it is 20-21 m (Sears and Perrin 2009). Females give birth about every 2-3 years in winter after a 10- to 12-month gestation; longevity is thought to be at least 80-90 years. Blue whales occur primarily in offshore deep waters and feed almost exclusively on euphausiids. Croll *et al.* (2001) determined that blue whales dived to an average of 141 m and for 7.8 minutes when foraging and to 68 m and for 4.9 minutes when not foraging. Data from southern California and Mexico showed that whales dove to > 100 m when foraging.

4.1.4. Fin Whales

Description: Fin whales are sexually dimorphic with females about 10-15% longer than males; in the Northern Hemisphere female length is about 22.5 m and for males 21 m (Aguillar 2009). Fin whales are slender with a narrow rostrum, a falcate fin located at 75% of total length; it is higher than the blue whale but lower than the sei whale. The ventral grooves are numerous and extend from the chin to the umbilicus. The pigmentation of the head region is strikingly asymmetrical whereas the left side, dorsal and ventral, is dark slate and the right side dorsal is light gray and the right ventral is white. The pigmentation also is shown in the baleen plates, which are gray and yellowish.

Status and Trends: Fin whales are endangered under the ESA, and are considered to be a depleted and strategic stock under the MMPA. Becker *et al.* (2020) generated species distribution models for the CA/OR/WA stock using 1991-2018 line-transect survey data to estimate density and abundance of cetaceans in the waters off of the U.S. west coast. The best-estimate of abundance for this stock from these data is taken as the estimate from 2018, or 11,065 (CV=0.405) animals (Becker *et al.* 2020, Carretta *et al.* 2023) and includes sea-state specific correction factors to prorate unidentified large whale sightings to species that would otherwise result in negative estimation biases (Becker et al. 2017; as cited in (Carretta *et al.* 2023). PBR for the CA/OR/WA stock is 80 whales (Carretta *et al.* 2023).

There are no reliable estimates of current and historical abundances for the entire northeast Pacific stock. Estimates of abundance in certain areas within the range of the stock are over a decade old. The best

provisional estimate for the Northeast Pacific stock is 3,168 (CV = 0.26) fin whales from the 2013 survey (Young *et al.* 2023). PBR is calculated to be 5.1

Distribution and Habitat Preferences: Fin whales occur throughout the North Pacific, from the northeastern Chukchi Sea (Crance *et al.* 2015) to the Tropic of Cancer (Mizroch *et al.* 2009) but their wintering areas are poorly known (Carretta *et al.* 2023). Fin whales occur year-round in the GOA (Stafford *et al.* 2007; as cited in (Carretta *et al.* 2023) and Oregon and Washington waters (Moore *et al.* 1998; as cited in (Carretta *et al.* 2023). Fin whales in the North Pacific spend the summer feeding along the cold eastern boundary currents. The North Pacific population summers from the Chukchi Sea to California, and winters from California southward (Carretta *et al.* 2023). Critical habitat has not been designated for fin whales.

Behavior and Life History: Fin whales become sexually mature between six to ten years of age, depending on density-dependent factors. Reproduction occurs primarily in the winter. Gestation lasts about 11 months and nursing occurs for 6 to 11 months (Aguillar 2009). Fin whales typically dive for 5 to 15 minutes, separated by sequences of 4 to 5 blows at 10 to 20 second intervals. Goldbogen *et al.* (2006) reported that fin whales in California made foraging dives to a maximum of 228-271 m and dive durations of 6.2-7.0 min. Fin whale dives likely coincide with the diel migration of krill. Fin whales feed on planktonic crustaceans, including *Thysanoessa sp*. and *Calanus sp*., as well as schooling fish including herring, capelin and mackerel (Aguillar 2009).

4.1.5. Sei Whales

Description: The sei whale is a typical sleek rorqual and is the third largest whale (behind blue and fin) reaching a maximum length of about 20 m and weighing 20 tons; the dorsal fin is larger than that of the blue and fin but all three species may be confused at sea (Horwood 2009). There is a single prominent ridge on the rostrum and a slightly arched rostrum with a downturned tip. They are dark gray dorsally and on the ventral surfaces of the flukes and flippers. There is no whitening of the lower lip as in fin whales and the baleen is dark gray, often with a yellowish-blue hue; but some white baleen may occur in some individuals.

Status and Trends: Sei whales are formally listed as endangered under the ESA, and consequently the ENP stock is considered as a depleted and strategic stock under the MMPA. There has been an IWC prohibition on taking sei whales since 1976, and commercial whaling in the U.S. has been prohibited since 1972. Tillman (1977; as cited in (Carretta *et al.* 2023) estimated sei whale abundance in the North Pacific at 42,000 whales. His estimates for the year 1974 ranged from 7,260 to 12,620. Hakamada *et al*. (2017; as cited in (Carretta *et al.* 2023) estimated sei whale abundance at 29,632 sei whales (CV = 0.242, 95% confidence interval [CI] 18,576–47,267) in the central and eastern North Pacific based on visual line-transect surveys conducted from 2010 and 2012. The best current estimate of abundance for California, Oregon, and Washington waters is the unweighted geometric mean of the 2008 and 2014 estimates, or 519 (CV=0.40) sei whales (Barlow 2016). The minimum population estimate is 374 whales and the calculated PBR is 0.75 sei whales per year (Carretta *et al.* 2023).

No data on trends in sei whale abundance exist for the ENP. Barlow (2016) noted that an increase in sei whale abundance observed in 2014 is partly due to recovery of the population from commercial whaling but may also involve distributional shifts in the population.

Distribution and Habitat Preferences: As summarized in Horwood (2009), sei whales have a worldwide distribution but are found primarily in cold temperate to subpolar latitudes rather than in the tropics or near the poles. Sei whales are distributed far out to sea in temperate waters worldwide and do not appear to be associated with coastal features (Carretta *et al.* 2023). Sei whales spend the summer months feeding in subpolar higher latitudes and return to lower latitudes to calve in the winter. There is some evidence from whaling catch data of differential migration patterns by reproductive class, with females arriving at and departing from feeding areas earlier than males (Horwood 2009). For the most part, the location of winter breeding areas is unknown. Critical habitat has not been designated for sei whales.

Behavior and Life History: Sei whales mature at about 10 years for both sexes. They are most often found in deep, oceanic waters of the cool temperate zone. They appear to prefer regions of steep bathymetric relief, such as the continental shelf break, canyons, or basins situated between banks and ledges. On feeding grounds, the distribution is largely associated with oceanic frontal systems (Horwood 2009). In the North Pacific, sei whales feed along the cold eastern currents (Perry *et al.* 1999). Prey includes calanoid copepods, krill, fish, and squid. The dominant food for sei whales off California during June through August is the northern anchovy, while in September and October they eat mainly krill. There are no reported diving depths or durations for sei whales.

4.1.6. Bowhead Whales

Description[3]: Bowhead whales have extremely large heads and dark stocky bodies with a distinctive white chin; they do not have a dorsal fin. Their bow-shaped skulls can be over 5 m long; their total body length can be 15 m. The bowhead whale also has the thickest blubber layer of any whale (~40 to 50 cm thick).

Using their large thick skull, bowheads are able break through up to ~20 cm thick ice cover. Alaska Native whalers have reported whales surfacing through ~ 60 cm ice. Bowhead whales often accumulate scars on their bodies from breaking ice, killer whale encounters, entanglement in fishing gear, and propellers. Scientists use these scars to identify individual whales.

Status and Trends: The western Arctic stock of bowhead whales is listed as endangered under the ESA; it is also considered depleted and strategic under the MMPA. All stocks of bowhead whales were intensely commercially hunted beginning in the early 16th century near Labrador, Canada; hunting efforts spread to the Bering Sea in the mid-19th Century (Ross 1993, Braham 1984, Bockstoce and Burns 1993, Bockstoce *et al.* 2007; as cited in (Young *et al.* 2023). Woodby and Botkin (1993 as cited in (Young *et al.* 2023) reported a minimum worldwide population estimate of 50,000 bowhead whales prior to commercial whaling, with 10,400 to 23,000 in the Western Arctic stock (dropping to less than 3,000 at the end of commercial whaling). Brandon and Wade (2006), as cited in (Young *et al.* 2023), used Bayesian model averaging to estimate that the Western Arctic stock consisted of 10,960 bowhead whales in 1848 at the start of commercial whaling.

In spring of 2019, an ice-based visual survey and a summer aerial line-transect survey were conducted to provide independent estimates of bowhead whale abundance. For the 2019 ice-based survey (Givens *et al.*

[3] Source: https://www.fisheries.noaa.gov/species/bowhead-whale Accessed August 2, 2023.

2021a), estimated an initial abundance of 12,505 whales (CV = 0.228). Givens *et al.* (2021b) developed a correction factor to account for the potential disturbance to bowheads from powered skiffs. By applying the correction factor, the authors increased the estimate of bowhead abundance from the 2019 ice-based survey to 14,025 whales (CV = 0.228). The 2019 abundance estimate from the aerial line-transect surveys is presently in review (Young *et al.* 2023). PBR for the western Arctic stock is calculated to be 116 bowhead whales (Young *et al.* 2023) .

Distribution and Habitat Preferences: The Western Arctic stock, also known as the Bering-Chukchi-Beaufort stock of bowhead whales is considered to be a geographically distinct population whose distribution ranges from northeastern Russia through Alaskan waters to northwestern Canada (Ireland *et al.* 2016). Most of the stock winters in the Bering Sea and migrates through the Bering Strait, Chukchi Sea, and Alaskan Beaufort Sea to summer feeding areas in the Canadian Beaufort Sea. After feeding in the Canadian Beaufort Sea, the Bering-Chukchi-Beaufort stock of bowhead whales migrates west through the Alaskan Beaufort Sea in the fall, returning to wintering areas in the Bering Sea. In July, bowhead whales are mainly within their main summer range in the eastern Beaufort Sea and Amundsen Gulf. They begin their autumn westward migration through the Alaskan Beaufort Sea in August, moving farther west into the Chukchi Sea in September, and are found wholly within the western Beaufort Sea and Chukchi Sea in October (Halliday *et al.* 2022). The westward migration of bowhead whales is generally complete by early to mid-October (Ireland *et al.* 2016). The spring migration pattern is influenced by environmental conditions; for example, it can be delayed by heavy ice coverage in the Bering Strait (Ljungblad *et al*. 1986; as cited in (Ireland *et al.* 2016)). Data from a satellite-tagging study conducted between 2006 and 2018 indicated that, although most tagged whales began to leave the Canadian Beaufort Sea in September, the timing of their westward migration across the Beaufort Sea is highly variable (Young *et al.* 2023).

While migrating through the Alaskan Beaufort Sea, bowhead whales are more strongly associated with inner continental shelf habitat than with other habitat types (Moore *et al.* 2000a). Light and moderate ice cover do not seem to impede bowhead whale movements (George *et al*. 1989; Moore and Reeves 1993; Ferguson *et al*. 2010; as cited in (Ireland *et al.* 2016)) but heavy nearshore ice cover in the fall has been shown to move the westward migration corridor farther from the coast, over deeper water (Moore *et al.* 2000a, Treacy 2002, Treacy *et al.* 2009). Critical habitat has not been designated for bowhead whales.

Behavior and Life History: Bowhead whales are able to break through ice cover that is up to 60 cm thick to create breathing holes. They feed throughout the water column; their most common prey are copepods, euphausiids, mysids, and gammarid amphipods. They may stay submerged for over an hour (Lee *et al.* 2005, Rugh 2008). Bowheads likely mate in late winter or early spring, although mating behavior has been observed at other times of the year. Gestation is about 13-14 months, and calves are usually born between April and June, during the spring migration (Nerini *et al.* 1984). The calving interval is about three to four years. Juvenile growth is relatively slow. Bowheads reach sexual maturity at about 15 years of age (12-14 m long) (Nerini *et al.* 1984). Growth for both sexes slows markedly at about 40-50 years of age; bowheads are exceedingly long-lived and may live to greater than 100-150 years of age (George *et al.* 1999).

4.1.7. Beluga Whales – Cook Inlet DPS

Description[4]: Beluga whales are known for their white color and range of vocal sounds; they are very social animals, and form groups to hunt, migrate, and interact. Beluga whales are found globally throughout the Arctic and sub-Arctic waters. In the U.S., they are found only in Alaskan waters, where they frequent coastal bays and inlets and move between salt and freshwater. Beluga whales have a thick layer of blubber and thick skin that allows them to survive in cold water. Belugas also lack a dorsal fin so that they can easily navigate between ice floes.

Status and Trends: On October 22, 2008, NMFS listed the population as endangered under ESA (73 FR 62919). NMFS designated critical habitat for Cook Inlet beluga whales on April 8, 2011 (76 FR 20180) (see Section 9.3.3).

In 1998, in response to the decline in Cook Inlet beluga abundance, NMFS initiated a status review of the DPS (63 FR 64228), and in 1999 NMFS received several petitions to list Cook Inlet beluga whales as endangered under the ESA (65 FR 17347). At that time, Alaska Native hunters were harvesting more than 50 Cook Inlet beluga whales per year (Mahoney and Shelden 2000). NMFS determined the population decline was due to overharvest, and because the subsistence harvest was regulated in 1999, NMFS subsequently determined that listing this stock under the ESA was not warranted at the time (65 FR 38778). However, in 2000 NMFS designated the Cook Inlet beluga population as depleted under the MMPA (65 FR 34590) because the minimum population estimate of 283 animals was only 36% of the Optimum Sustainable Population of 780 whales.

Due to continuing declines, subsistence hunting of Cook Inlet beluga whales was suspended in 2006, and the population was expected to recover at a rate of 2 to 6% per year (Hobbs *et al.* 2008). This rate of recovery was not observed, and the population continued to decline at a rate of 1.3% per year between 1999 and 2012 (Hobbs *et al.* 2015).

Systematic surveys of Cook Inlet beluga whale abundance were not conducted prior to the mid-1990s. The best historical estimate of Cook Inlet beluga abundance is derived from a 1979 survey, which estimated a total population of 1,293 belugas (Calkins 1989). In 1993, NMFS began conducting systematic aerial surveys of the Cook Inlet beluga population. These systematic surveys showed a decline in Cook Inlet beluga abundance from 653 individuals in 1994 to 347 belugas in 1998 (NMFS 2019b).

The 2022 Final SAR (Young *et al.* 2023) documented an estimated abundance of 279 (CV = 0.061) and a PBR of 0.53 for the Cook Inlet DPS based on a weighted average from annual estimates in 2014, 2016, and 2018 (Shelden and Wade 2019). However, Goetz *et al.* (2023) calculated an abundance estimate for the DPS based on video and counting passes conducted during late June 2021 and early June 2022. The authors recommend that 331 be considered the official best estimate for this population and note that there is 65.1% probability that the population is now increasing at 0.9% per year. During a prior 10-year time period (2008 to 2018), the population of Cook Inlet belugas had experienced a decline of about 2.3% per year (95% PI: -4.1% to -0.6%) (Wade *et al.* 2019).

Distribution and Habitat Preferences: Beluga whales are distributed throughout Arctic and sub-Arctic waters (Young *et al.* 2023). Five stocks of beluga whales are recognized in Alaska: Beaufort Sea stock,

[4] https://www.fisheries.noaa.gov/species/beluga-whale Accessed August 7, 2023

eastern Chukchi Sea stock, eastern Bering Sea stock, Bristol Bay stock, and Cook Inlet stock (Young *et al.* 2023). Of these stocks, only the Cook Inlet DPS is listed under the ESA. See Section 4.2.8 for a discussion of the non-ESA-listed beluga stocks that may be encountered by AFSC fisheries research. The Cook Inlet DPS of beluga whales is geographically and genetically isolated from other beluga whale stocks in Alaska (Young *et al.* 2023), and is recognized as a DPS under the ESA. The degree of genetic difference between the Cook Inlet beluga DPS and other stocks indicates they have been isolated and genetically distinct for several thousand years (O'Corry-Crowe *et al.* 1997).

Historically, beluga whales were distributed throughout Cook Inlet, with occasional sightings in the GOA (Huntington 2000, Laidre *et al.* 2000, Moore *et al.* 2000b, Rugh *et al.* 2000). However, in the 2000s the range of the Cook Inlet beluga whale has contracted to the upper reaches of the inlet (Rugh *et al.* 2010). Cook Inlet beluga whales are found seasonally in distinct areas of the inlet, and during the ice-free months are concentrated near river mouths (Shelden *et al.* 2015). Beluga whales that live in Cook Inlet remain there year-round but do show seasonal shifts in distribution (Hobbs *et al.* 2005, Goetz *et al.* 2012, Shelden *et al.* 2013, Shelden *et al.* 2017); they generally spend the ice-free months in upper Cook Inlet, moving into middle and lower inlet waters in the winter. The seasonal movements of beluga whales in Cook Inlet appear to be influenced by ice coverage, prey availability, and peak river discharge events (Hobbs *et al.* 2005, Rugh *et al.* 2010, Goetz *et al.* 2012). For example, beluga whale concentrations in upper Cook Inlet during April and May correspond with eulachon migrations to rivers and streams in the northern portion of upper Cook Inlet (NMFS 2003, Angliss and Outlaw 2005).

Behavior and Life History: Beluga whales feed on a wide range of fish and benthos (Quakenbush *et al.* 2015), including four Pacific salmon species that spawn in rivers throughout upper Cook Inlet (Chinook, coho, sockeye, and chum) and eulachon. Primary foraging locations for Cook Inlet beluga include the Susitna River Delta (the Big and Little Susitna rivers), Eagle Bay, Eklutna River, Ivan Slough, Theodore River, Lewis River, and Chickaloon Bay and River (NMFS 2008).

4.1.8. Killer Whales – ENP Southern Resident (SRKW)

Description[5]: Killer whales are easily recognized by their distinctive black and white bodies. They are mostly black dorsally and white ventrally, with white patches near the eyes. Individuals can have a gray or white saddle patch behind the dorsal fin. Killer whale markings vary widely among individuals and populations, and are used to identify them. Adult males develop disproportionately larger pectoral flippers, dorsal fins, tail flukes, and girths than females.

Status and Trends: Eight killer whale stocks are recognized within the Pacific U.S. EEZ. The ENP Southern Resident (SRKW) DPS was listed as endangered in 2005 (70 FR 69906). Killer whales from six other non-ESA-listed stocks that may be encountered by the research activities are described in Section 4.2.11.

In 1993, the 3 pods comprising the SRKW stock totaled 96 killer whales (Ford *et al*. 1994; as cited in (Carretta *et al.* 2023). The population increased to 99 whales in 1995, then declined to 79 whales in 2001 and most recently numbered 74 whales in 2021 (Carretta *et al.* 2023). Since 1995, the population size has

[5] https://www.fisheries.noaa.gov/species/killer-whale Accessed August 8, 2023

declined approximately 1% annually (Carretta *et al.* 2023). PBR for the stock is 0.13, or about 1 animal every 7 years.

Distribution and Habitat Preferences: Killer whales are the most widely distributed cetacean; they can be found in all oceans and seas (Leatherwood and Dahlheim 1978; as cited in (Carretta *et al.* 2023); they occur in tropical and offshore waters, but prefer the colder waters of both hemispheres. Their greatest abundances are found within 800 km of major continents (Mitchell 1975, Forney and Wade 2006; as cited in (Carretta *et al.* 2023). Killer whales inhabit the entire Alaskan coast (Braham and Dahlheim 1982, Hamilton *et al*. 2009; as cited in (Carretta *et al.* 2023), in British Columbia and Washington inland waters (Bigg *et al*. 1990; as cited in (Carretta *et al.* 2023), and along the outer coasts of Washington, Oregon and California (Hamilton *et al*. 2009; as cited in (Carretta *et al.* 2023). The SRKW stock is transboundary and occurs mainly within the inland waters of Washington State and southern British Columbia but also extends in coastal waters from central California into southern Southeast Alaska (Carretta *et al.* 2023); the distribution overlaps with AFSC and IPHC research activities. Critical habitat for SRKW was revised in 2021 (see Section 9.3.2).

Behavior and Life History: Killer whales are very social with the basic social unit based on maternal relationships (Ford 2009). Males attain sexual maturity at about 15 years of age. Females give birth between 11 and 16 years of age and there is usually a 5-year interval between births. Gestation is 15-18 months and weaning is about 1-2 years after birth. Life expectancy for females is about 50 years with a maximum of 80-90; males typically live to about 29 years of age (Ford 2009). SRKW are the ocean's top predator and primarily feed on Chinook salmon that return to rivers in Washington and southern British Columbia (Hanson *et al.* 2010).

4.1.9. North Pacific Right Whales

Description[6]: The North Pacific right whale has a stocky black body, although some individuals have white patches on their undersides. They have no dorsal fin, a large head that is about a quarter of its body length, and raised patches of rough skin, called callosities, on the head, over its eyes, behind the blowhole, and around the mouth. The tail is broad, deeply notched, and all black with a smooth trailing edge. Females are slightly larger than males.

Status and Trends: The North Pacific right whale has been listed as endangered under the ESA since 1973 when it was listed as the "northern right whale". In 2008, NMFS relisted the North Pacific right whale as a separate endangered species from the North Atlantic right whale (73 FR 12024). The ENP stock of north Pacific right whales is classified as strategic and depleted under the MMPA.

North Pacific right whale abundance is critically low. The best available abundance estimate is based on mark-recapture analyses of photo-identification and genetic data through 2008 (Young *et al.* 2023). Wade *et al.* (2011) developed an abundance estimate of 31 (95% CL: 23-54) Bering Sea. PBR for this stock is 0.05, equivalent to one take every 20 years (Young *et al.* 2023). There appear to be more males than females in the population and calf production is very low. For the period 2014–2018, no human-caused mortality or serious injury was reported for North Pacific right whales (Young *et al.* 2023).

[6] https://www.fisheries.noaa.gov/species/north-pacific-right-whale Accessed August 7, 2023.

Distribution and Habitat Preferences: The summer range of the ENP stock of North Pacific right whales includes the GOA and Bering Sea. According to Young *et al.* (2023), there have been far fewer sightings of right whales in the GOA than in the Bering Sea. Given how extremely rare this species is today, sightings are relatively rare, typically consisting of a single individual. However, in 2017, the IWC's Pacific Ocean Whale and Ecosystem Research survey reported 15 right whales in the southeastern Bering Sea using a combination of passive acoustic monitoring and visual sightings (Matsuoka *et al.* 2017, as cited in (Young *et al.* 2023). Three right whales were sighted in 2018, two of which were observed in right whale designated critical habitat (Matsuoka *et al*. 2018, as cited in (Young *et al.* 2023). No right whale observations were reported in the southeastern Bering Sea from January through April, supporting a theory that the whales migrate out of the Bering Sea during winter (Wright 2017, as cited in (Young *et al.* 2023). Passive acoustic data from 2008–2016 detected North Pacific right whale calls in the northern Bering Sea, but it remains unknown whether this indicates reoccupation of a historic distribution or a northward shift in distribution (Young *et al.* 2023).

In 2006, NMFS issued a final rule designating two areas in the North Pacific as northern right whale critical habitat; one area in the GOA south of Kodiak Island and one in the Bering Sea (71 FR 38277) (See Section 9.3). In 2008, NMFS re-designated the same two areas as ENP right whale critical habitat under the newly recognized species name, *E. japonica* (73 FR 19000).

Behavior and Life History[7]: Right whales are baleen whales; they filter large volumes of ocean water through baleen plates to obtain copepods and other zooplankton. Right whales feed from spring to fall and in winter in certain areas. Their primary food sources are zooplankton, including copepods, euphausiids, and cyprids. Unlike some other baleen whales, right whales are skimmers: they feed while moving with their baleen plates exposed through patches of zooplankton in the water.

4.1.10. Ringed Seals

Description[8]: Ringed seals have a dark coat with light-colored rings on their back and sides, and a light-colored belly. Their bodies are plump with a small head and snout. Pups are born with a white natal coat called lanugo, which is shed when they reach ~4 to 6 weeks of age. Ringed seals have thick, strong claws on their small fore flippers that they use to maintain breathing holes through 2 m or more of ice. Their length at maturity averages 1.2 to 1.4 m and they weigh between 50 and 70 kilograms (kg). The average weight of a ringed seal pup at birth is ~4.5 kg.

Status and Trends: The Arctic ringed seal subspecies was listed as threatened under the ESA in 2012 (77 FR 76706). Of primary concern for this population is the anticipated continued loss of sea ice and snow cover due to climate change effects. This habitat loss poses a sizeable threat to the persistence of the stock (Young *et al.* 2023). Because of its threatened status under the ESA, this stock is designated as depleted under the MMPA and is also classified as a strategic stock.

Survey methods have been developed and applied to substantial portions of the range of ringed seals in U.S. waters but efforts to date have not produced a reliable population estimate for the entire Arctic stock (Young *et al.* 2023). Reliable abundance estimates are not yet available for the Chukchi and Beaufort

[7] https://www.fisheries.noaa.gov/species/north-pacific-right-whale Accessed August 7, 2023.
[8] https://www.fisheries.noaa.gov/species/ringed-seal; Accessed August 8, 2023.

seas. However, using a subset of data collected from aerial abundance and distribution surveys over the entire ice-covered portions of the Bering Sea in 2012 (Moreland *et al.* 2013), Conn *et al.* (2014) calculated an abundance estimate of 171,418 ringed seals (95% CI: 141,588-201,090) in U.S. Bering Sea waters. This estimate for Bering Sea ringed seals is considered to be low by a factor of 2 or more because availability bias due to seals in the water at the time of the surveys was not accounted for and the estimate did not include ringed seals in the shorefast ice zone (Young *et al.* 2023). Reliable data on trends in population abundance for the U.S. Arctic stock of ringed seals are not available. PBR for the U.S. portion of the Arctic stock of ringed seals is estimated to be 4,755 (Young *et al.* 2023).

Distribution and Habitat Preferences: Ringed seals are distributed in all seasonally ice-covered seas of the Northern Hemisphere (Lang *et al.* 2021, Young *et al.* 2023). NMFS currently recognizes five subspecies of ringed seals but only the Arctic stock occur in U.S. waters of the Arctic Ocean and Bering Sea (Rice and Society for Marine Mammalogy 1998). They are year-round residents of the Chukchi and Beaufort seas and are generally the most encountered seal in U.S. Arctic waters.

Ringed seals are abundant in the winter and spring on shorefast and pack ice in the northern Bering Sea, Norton Sound, Kotzebue Sound, Chukchi Sea, and Beaufort Sea, where they utilize sea ice for pupping nursing, and resting (NMFS 2022a). Landfast ice has been shown to be the best habitat for ring seal pupping (Kelly 1988). AFSC research activates would only occur during open water season and thus pupping would not be disturbed.

In the summer open-water months, ringed seals use sea ice as a platform for molting and resting. However, they can forage pelagically along the ice edges or in open-water productive areas for long periods of time over long distances. In the fall, ringed seals utilize sea ice as a platform for resting and rarely haulout in terrestrial habitats (Young *et al.* 2023).

In May 2022 and 2023, researchers, used trained wildlife-detection dogs to survey an 88 square kilometers (km^2) area near Northstar Island in the Beaufort Sea for the presence of ringed seals and ringed seal structures such as breathing holes and lairs. The authors documented 61 ringed seal structures in 2022 and 73 in 2023. Seal structures were detected close to industrial facilities and ice trails (Quakenbush *et al.* 2022, Quakenbush *et al.* 2023).

On April 1, 2022, NMFS designated critical habitat for the Arctic subspecies of ringed seals (87 FR 19232). The critical habitat designation covers areas of marine habitat in the Bering, Chukchi, and Beaufort seas (see Section 9.3.4).

Behavior and Life History: Ringed seals predominantly feed on pelagic fish such as cod (Crain *et al.* 2021) but they also consume shrimp and planktonic crustaceans. The relative importance of each type of prey depends on local availability and season (Lowry *et al*. 1998, as cited in (Ireland *et al.* 2016)). They have been shown to dive to depths of up to 46 m or more while foraging.

Ringed seals are hunted by killer whales and polar bears. Spatial distributions and population fluctuations of ringed seals and polar bears appear to be tightly correlated in some areas (Stirling and Øritsland 1995 as cited in (Ireland *et al.* 2016).

4.1.11. Bearded Seals

Description[9]: Bearded seals are the largest species of Arctic ice seal; they range in length from 2 to 2.5 m and weigh from 260 to 360 kg. Their coats are generally gray to brown in color with no distinct patterns. Bearded seals have large bodies and small square fore flippers. Long, white whiskers give this species its "beard."

Status and Trends: The Beringia DPS of bearded seals was listed as threatened under the ESA in 2012 (77 FR 76740). Like ringed seals, the anticipated continued loss of sea ice and snow cover due to climate change effects, is of primary concern for this stock and poses a sizeable threat to its persistence (Young *et al.* 2023). Because of its threatened status under the ESA, this stock is designated as depleted under the MMPA and is also classified as a strategic stock.

As described for ringed seals, aerial abundance and distribution surveys of ice seals were conducted by U.S. and Russian researchers in the spring of 2012 and 2013; the surveys were conducted over the entire ice-covered portions of the Bering Sea (Moreland *et al.* 2013). Using a subset of the data collected from U.S. waters during the 2012 survey, Conn *et al.* (2014) calculated an abundance estimate of 301,836 bearded seals (95% CI: 238,195-371,147). Spring surveys conducted in 1999 and 2000 along the Alaska coast indicate that bearded seals are typically more abundant 37-185 km from shore than within 37 km from shore (Young *et al.* 2023). Reliable data on trends in population abundance for the bearded seals are not available. PBR for the U.S. portion of the Beringia stock of bearded seals is estimated to be 8,210 (Young *et al.* 2023).

Distribution and Habitat Preferences: Bearded seals are associated with sea ice and exhibit an Arctic circumpolar distribution (Young *et al.* 2023). Bearded seals from the subspecies, *E. barbatus nauticus* are divided into two DPSs, one of which is the Beringia DPS. This DPS inhabits U.S. Arctic waters (Ireland *et al.* 2016). The distribution of bearded seals in Alaskan waters is very similar to that of ringed seals, but bearded seals are typically more abundant from ~40-185 km from shore than within 40 km of shore (Simpkins *et al.* 2003, Bengtson *et al.* 2005). Many seals that winter in the Bering Sea move north through the Bering Strait from late April through June and spend the summer in the Chukchi Sea (Burns 1967, 1981; as cited in (Young *et al.* 2023). They are broadly distributed during summer and rarely haul out on land, Juveniles tend to not follow the ice northward but remain near the coasts of the Bering and Chukchi seas (Burns 1967, 1981; Heptner *et al*. 1976; Nelson 1981; Cameron *et al*. 2018; all as cited in (Young *et al.* 2023). Bearded seals occur mainly in relatively shallow areas in summer because they predominantly feed on benthic bivalves (Burns and Eley 1978).

During winter, most bearded seals in Alaskan waters are found in the Bering Sea as their movements are related to the advance and retreat of sea ice (Kelly 1988). As the ice forms again in the fall and winter, most seals move south with the advancing ice edge through the Bering Strait into the Bering Sea where they spend the winter (Burns and Frost 1979; Frost et al. 2005, 2008; Cameron and Boveng 2007, 2009; Breed et al. 2018; Cameron et al. 2018; all as cited in (Young *et al.* 2023).

[9] https://www.fisheries.noaa.gov/species/bearded-seal; Accessed August 8, 2023.

On April 1, 2022, NMFS designated critical habitat for the Beringia DPS of bearded seals (87 FR 19180). The critical habitat designation covers areas of marine habitat in the Bering, Chukchi, and Beaufort seas (see Section 9.3.7).

Behavior and Life History: Bearded seals primarily feed on benthic invertebrates such shrimps, crabs, clams, and whelks and fish such as cod and sculpin (Harwood *et al.* 2015). They forage near the bottom and typically dive to depths of less than 100 m. They do not like deep water and prefer to forage in waters less than 200 m deep, where they can reach the ocean floor (Harwood *et al.* 2005).

Bearded seals are particularly associated with sea ice during periods of reproduction and molting (Young *et al.* 2023). The presence of sea ice is considered a requirement for whelping and nursing their young. In addition, molting in this species is believed to be induced by elevated skin temperatures that can only be achieved when seals haul out of the water (Young *et al.* 2023). Bearded seals tend to prefer sea ice with natural openings but they have been reported to maintain breathing holes in sea ice and broken areas within the pack ice, particularly where water depth is <200 m (Harwood *et al.* 2005). Bearded seals reach sexual maturity at ~6-7 years of age and give birth on the sea ice, which they use as a platform for molting and resting also. Pups are nursed on the ice for ~24 days. By the time they are a few days old, they spend about half their time in the water. Within a week of birth, pups are capable of diving to a depth of ~60 m (Harwood *et al.* 2005).

4.1.12. Steller Sea Lions – Western DPS

Description: Steller sea lions exhibit significant sexual dimorphism; the average length of males is 2.8 m and females are 2.4 m in length (Loughlin 2009). Estimated average weight of males is 566 kg and females are about 263 kg. Pup weight at birth is 16-23 kg and may be slightly larger in the western part of their range. Pups are born with a wavy, chocolate brown fur that molts after 3-6 months. Adult fur color varies between a light buff to reddish brown with most of the under parts and flippers a dark brown to black; naked parts of the skin are black. Both sexes become blonder with age. Adult males have long, coarse hair on the chest, neck, and shoulders which are massive and muscular (Loughlin 2009).

Status and Trends: Based on demographic and genetic dissimilarities, NMFS identified two DPSs of Steller sea lions and listed them under the ESA: a western endangered DPS and a threatened but now delisted eastern DPS (62 FR 24345). Section 4.2.18 discusses the non-ESA-listed eastern DPS. Under the MMPA, the western DPS is classified as a strategic stock and therefore is also designated as depleted (Young *et al.* 2023).

In the late 1970s, abundance of western Steller sea lions was estimated to be 220,000 to 265,000 animals; however, by 2000 the population had decreased to less than 50,000 (Loughlin *et al*. 1984, Loughlin and York 2000, Burkanov and Loughlin 2005; all as cited in (Young *et al.* 2023). Since 2003, abundance has increased but with considerable regional variation (Sease and Gudmunson 2002; Burkanov and Loughlin 2005, Fritz *et al*. 2019; all as cited in (Young *et al.* 2023).

Comprehensive aerial photographic and land-based surveys of western Steller sea lions in Alaska were most recently conducted during breeding seasons in 2018 and 2019 (Sweeney *et al.* 2018, 2019; as cited (Young *et al.* 2023). The pup and non-pup model-predicted counts in Alaska in 2019 were 12,581 (95% credible interval of 11,308 to 14,051) and 40,351 (35,886 to 44,884), respectively. Because the current population size (N) and a pup multiplier to estimate N are not known, it is not possible to estimate

abundance. Therefore, N_{est} and N_{min} for the U.S. portion of the western DPS is the sum of these numbers or 52,932 (Young *et al.* 2023). PBR is 318 for the U.S. portion of the DPS.

Model results show pup and non-pup counts of western DPS Steller sea lions in Alaska were at their lowest levels in 2002 and have increased at rates of 1.63% and 1.82% per year between 2002 and 2019 (Sweeney *et al.* 2019; as cited in (Young *et al.* 2023). Population abundance continues to exhibit strong regional differences across the species' range in Alaska, with positive trends observed in the GOA and eastern Aleutian Islands region, including the eastern Bering Sea, and generally negative trends observed in the central and western Aleutian Islands (Young *et al.* 2023).

Distribution and Habitat Preferences: Steller sea lions occur throughout the North Pacific Ocean rim from Japan to southern California (Young *et al.* 2023). They are widely dispersed outside of the breeding season (late May to July) following prey availability. Steller sea lions tend to prefer isolated offshore rocks and islands to breed and rest. Although rookeries and rest sites occur in many areas, principally on exposed rocky shorelines and wave-cut platforms, the locations used are specific and change little from year to year (Loughlin 2009). The eastern stock of Steller sea lions has historically bred on rookeries located in Southeast Alaska, British Columbia, Oregon, and California. However, within the last 10 years a new rookery has become established on the outer Washington coast at the Carroll Island and Sea Lion Rock complex, where >100 pups were born in 2015 (R. DeLong and P. Gearin, pers. comm. as cited in (Young *et al.* 2023). Adult Steller sea lions tend to return to their birth island to breed but range widely (some yearlings have been seen > 1,000 km from their birth rookery) during their first few years and the non-breeding season (Loughlin 2009). See Section 9.3.5 for a discussion of Steller sea lion critical habitat.

Behavior and Life History: Steller sea lions breed from late May to early July at rookeries located on remote islands and rocks throughout their range. One pup is born annually after a 9-month gestation period. As with most pinnipeds, embryo implantation typically is delayed 3 months. Pups are weaned prior to the breeding season but some may remain with their mothers for 2-3 years (Loughlin 2009). They are opportunistic predators, feeding primarily on a wide variety of fishes and cephalopods. Compared to other pinnipeds, Steller sea lions tend to make relatively shallow dives, with few dives recorded to depths greater than 250 m. Maximum depths recorded for individual adult females in summer are in the range from 100 to 250 m; maximum depth in winter is greater than 250 m. The maximum depth measured for yearlings in winter was 72 m and average depths are near 18 m and in shallow near-shore waters (Loughlin 2009).

4.1.13. Guadalupe Fur Seals

Description[10]: Guadalupe fur seals are a pelagic species and spend most of their time in the open ocean. Like sea lions, Guadalupe fur seals are otariids and have long external ear flaps as well as large front flippers that allow them to walk on land. They are similar to northern fur seals in appearance but are slightly smaller and have a more elongated snout. Males and females differ slightly in size; males can reach ~2 m in length and weigh ~136 kg. Females grow to ~1.2 m and can reach 45 kg. Juvenile Guadalupe fur seals are difficult to discern from juvenile California sea lions and northern fur seals.

[10] https://www.marinemammalcenter.org/animal-care/learn-about-marine-mammals/pinnipeds/guadalupe-fur-seal Accessed August 7, 2023

Status and Trends: NMFS listed the Guadalupe fur seal as threatened in 1985 (50 FR 51252). The population is considered to be depleted under the MMPA. The population is considered to be a single stock because all individuals are recent descendants from 1 breeding colony at Isla Guadalupe, Mexico (Carretta *et al.* 2023).

The Guadalupe fur seal population grew at a rate of ~6% between 1984 and 2013 (Carretta *et al.* 2023). Current population estimates are based on pup counts from 2013, with a range of correction factors applied to account for uncounted age classes and pre-census pup mortality. The resulting estimate is 34,187 individuals and PBR is 1,062 seals per year (Carretta *et al.* 2023). However, the vast majority of this PBR would apply towards incidental mortality in Mexico as most of the population occurs outside of U.S. waters. The fraction of this stock that occurs in U.S. waters and the amount of time spent in U.S. waters is unknown, and a PBR in U.S. waters is not available.

Distribution and Habitat Preferences: The core range of Guadalupe fur seals lies in coastal waters south of San Francisco ranging to the waters off of Baja (McCue *et al.* 2021). However, these fur seals are increasingly observed in Oregon and Washington waters (García-Aguilar *et al.* 2018). Guadalupe fur seals fitted with satellite tags have been documented to travel as far north as Graham Island and Vancouver Island, British Columbia(García-Aguilar *et al.* 2018), where they may be encountered by IPHC research efforts. Critical habitat for this species has not been designated.

Behavior and Life History: Guadalupe fur seals pup and breed mainly at Isla Guadalupe, Mexico (Carretta *et al.* 2023). Mating occurs on land and peaks near the beginning of July. Gestation lasts about 9 months, and females do not generally give birth every year (McCue *et al.* 2021). Pups are weaned at about 9 months of age. Guadalupe fur seals mainly feed on squid and other cephalopods but also eat fish such as myctophids, mackerel, anchovies, and sardines (McCue *et al.* 2021).

4.2. Non-Listed Marine Mammal Species, Stocks, or DPSs

4.2.1. Harbor Porpoises

Description: Harbor porpoises are short and stocky and are one of the smaller porpoises. On average females are about 1.6 m and 60 kg in size, while males average 1.4 m and 50 kg (Bjørge and Tolley 2009). They are dark gray dorsally and the chin and ventral surfaces are white. Harbor porpoises have a small triangular dorsal fin that is easily recognized when swimming.

Status and Trends: Three stocks of harbor porpoise may be encountered by AFSC research activities: the Southeast Alaska Stock; the GOA Stock and the Bering Sea stock. None of these stocks are listed under the ESA and they are not considered depleted under the MMPA.

Southeast Alaska Stocks – In 2022, the Southeast Alaska stock was further divided into three separate stocks: the Northern Southeast Alaska (N-SEAK) Inland Waters stock; the Southern Southeast Alaska (S-SEAK) Inland Waters stock; and the Yakutat/Southeast Alaska (Y-SEAK) Offshore Waters stock (Young *et al.* 2023). Using both aerial and shipboard surveys between 1991 and 2012, the National Marine Mammal Laboratory (MML) estimated harbor porpoise abundance for coastal and inland waters of Southeast Alaska (Hobbs and Waite 2010, Dahlheim *et al*. 2015; as cited in (Young *et al.* 2023). Estimates of abundance for the N-SEAK and S-SEAK Inland Waters stocks are, respectively, 1,619 (CV = 0.26) and 890 (CV = 0.37) harbor porpoise. A current estimate of abundance is not available for the Y-

SEAK Offshore Waters stock (Young *et al.* 2023). Because these estimates of abundance are more than 8 years old, they are no longer considered reliable for current management purposes.

PBRs for the N-SEAK and the S-SEAK Inland Waters stocks are 13 and 6.1 porpoises, respectively. Because there is no current estimate of N_{MIN}, the PBR for the Y-SEAK stock is considered undetermined (Young *et al.* 2023).

GOA Stock – Young *et al.* (2023) report the abundance of the GOA Stock to be 31,046 (CV = 0.21). The abundance estimate was derived by applying a correction factor of 2.96 to data compiled in 1998. N_{MIN} for this stock is considered unknown because the data are more than 8 years old, and therefore PBR for this stock is considered undetermined (Young *et al.* 2023).

Bering Sea Stock – Young *et al.* (2023) reported a corrected abundance of Bering Sea harbor porpoises of 48,25 animals using 1999 data. This abundance was used in the 2019 final rule (84 FR 46788). According to Young *et al.* (2023), abundance estimates for the Bering Sea Stock of harbor porpoises were also calculated from surveys conducted on portions of the stock's range over three years: 2002, 2008, and 2010. The entire range of the stock was surveyed over those three years. Corrected abundance estimates for harbor porpoise in the Bering Sea are reported in Young *et al.* (2023) as 2,276 porpoise (CV = 0.46) for 2002, 5,713 (CV = 0.40) for 2008, and 1,173 (CV = 0.66) for 2010 (Young *et al.* 2023). However, because the data is over 8 years old, N_{MIN} is unknown and PBR is underminable for this stock (Young *et al.* 2023).

Distribution and Habitat Preferences: Harbor porpoises are found throughout the coastal waters of the North Pacific, North Atlantic, and Black Sea. In the ENP, they are distributed from Point Conception, California to Alaska and across to Russia (Carretta *et al.* 2023). In Alaska, harbor porpoise primarily frequent the coastal waters of the GOA and Southeast Alaska (Dahlheim *et al*. 2000, 2009; as cited in (Young *et al.* 2023).They usually are found in waters less than 100 m deep; however, occasionally they occur in deeper waters (Hobbs and Waite 2010; as cited in (Young *et al.* 2023). They are typically found in groups of 1-3 individuals often consisting of a female-calf pair but larger groups are not uncommon (Bjørge and Tolley 2009).

Behavior and Life History: Harbor porpoises calve and breed throughout their range, generally giving birth from May through July. Calves remain dependent for at least six months (Leatherwood and Reeves 1986). Harbor porpoises are usually shy and avoid vessels; thus, they are difficult to approach. Harbor porpoise often feed near bottom in waters less than 200 m deep on bottom-dwelling fishes and small pelagic schooling fishes with high lipid content; herring and anchovy are common prey (Leatherwood and Reeves 1986, Bjørge and Tolley 2009). Harbor porpoises tend to avoid ships and rarely bow ride.

4.2.2. Dall's Porpoises

Description: Dall's porpoises are stocky and medium-sized with a wide-based dorsal fin that white along the dorsal edge. The tail stock is deepened and there is a noticeable beak; the flippers and fluke are small (Jefferson *et al.* 2015). Males are somewhat larger than females, but both may reach a length of about 2.2 m and weigh about kg or more. The body is black with a large white flank patch that extends to the level of the dorsal fin. They are extremely fast in the water and are often misidentified as baby killer whales (Osborne *et al.* 1988).

Status and Trends: There are two recognized stocks found in the North Pacific: the Alaska stock and the CA/WA/OR stock. Neither stock is listed under the ESA, nor are they considered depleted under the MMPA. The CA/OR/WA stock might be affected by IPHC research activities off the U.S. west coast, while research by AFSC and IPHC in Alaskan waters may encounter individuals from the Alaskan Stock. research activities.

Alaska Stock - A 2012 vessel survey conducted between 30 and 62°N in the North Pacific Ocean and the Bering Sea between June and August reported sightings of Dall's porpoise across a wide range of water depths and temperatures (Young *et al.* 2023). Concentrations of animals were noted near Aleutian passes in water depths less than 1,000 m (Suzuki et al. 2016; as cited in (Young *et al.* 2023). Young *et al.* (2023) report a that corrected population estimate from 1987 to 1991 could be as low as 83,400 for this stock. Because these surveys are more than 8 years old, this abundance estimate for the Alaska stock of Dall's porpoise is no longer considered reliable. However, Young *et al.* (2023) assumes H_{MIN} to correspond to the point estimate of 13,110 (CV = 0.222015) computed by Rone *et al.* (2017; as cited in (Young *et al.* 2023) from a 2015 vessel-based abundance survey in the GOA. using this H_{MIN} value, PBR is calculated to be 131.

CA/OR/WA Stock - The best abundance estimate of Dall's porpoises is taken from 2018 transect line efforts which estimated 16,498 animals (CV = 0.608) (Carretta *et al.* 2023). The minimum population estimate is 10,286 Dall's porpoises with a PBR of 99 animals (Carretta *et al.* 2023). The distribution and abundance of Dall's porpoises off California, Oregon and Washington varies considerably at both seasonal and interannual time scales but the population size of Dall's porpoises within the California Current survey area has been relatively stable from 1996 to 2008, contracting and expanding with the extent of suitable habitat (Carretta *et al.* 2023).

Distribution and Habitat Preferences: The species is found only in temperate waters of the North Pacific and adjacent seas (Jefferson *et al.* 2015). Dall's porpoises are seen in shelf, slope and offshore waters off California, Oregon and Washington (Carretta *et al.* 2023). Sighting data suggest that north-south movements occur between these states as oceanographic conditions change, both on seasonal and inter-annual time scales.

Dall's porpoises occur in small groups, although aggregations of at least 200 individuals have been reported. Dall's porpoises occur only rarely in groups of mixed species, although they are sometimes seen in the company of harbor porpoises and gray whales (Jefferson *et al.* 2015). This is an oceanic species found along the continental shelf and in inland and coastal waters. This species has seasonal inshore-offshore and north-south movements but these movements are poorly understood (Jefferson *et al.* 2015).

Behavior and Life History: Calves are born in summer, and gestation is thought to be about one year (Osborne *et al.* 1988, Jefferson *et al.* 2015). Dall's porpoises apparently feed at night. Prey species in the inland waters of British Columbia and Puget Sound include squid and schooling fishes (Walker *et al.* 1998). Dall's porpoise equipped with dive recorders dove to about 94 m in water that exceeded 200 m while feeding in Puget Sound inland waters. Dive duration was about 1.3 minutes (Jefferson *et al.* 2015).

4.2.3. Pacific White-sided Dolphins

Description: Pacific white-sided dolphins are medium-sized. Adults range from 1.7 m to 2.5 m long and weigh 75-198 kg; males are slightly larger than females (Black 2009). They are boldly marked with a

dark gray or black dorsal surface, light gray sides and light gray 'suspender stripes' anterior. The dorsal fin is falcate to lobate with a rounded tip; it has a darker leading edge with light gray color covering two thirds of the posterior portion; the flukes are all dark (Black 2009).

Status and Trends: There are two recognized stocks found in the North Pacific: the North Pacific stock and the CA/OR/WA stock. Neither stock is listed under the ESA nor are they considered depleted under the MMPA. Although there is clear evidence that two forms of Pacific white-sided dolphins occur in the North Pacific, the there are no known differences in color pattern, and it is not currently possible to distinguish animals without genetic or morphometric analyses. Geographic stock boundaries appear dynamic and poorly understood. Therefore, morphometrics cannot be used to differentiate the two forms (Carretta *et al.* 2023).

North Pacific Stock: The most complete population abundance estimate for Pacific white-sided dolphins was calculated from line-transect analyses applied to the 1987-1990 marine mammal sighting survey data across the North Pacific from 25°N and into the Bering Sea (Buckland *et al*. 1993; as cited in (Young *et al.* 2023). While the complete Buckland *et al*. (1993) abundance estimate of 931,000 animals is not appropriate to apply to the management stock in Alaska waters, the portion of the estimate derived by Buckland et al. (1993) from sightings north of 45°N in the GOA (26,880 animals) can be used as the population estimate for this area (Young *et al.* 2023). Because the abundance estimate is more than 8 years old, N_{MIN} is considered unknown and PBR is not able to be determined for this stock.

CA/WA/OR Stock: The best estimate of Pacific white-sided dolphin abundance for the CA/OR/WA stock is taken as the estimate from 2018 or 34,999 (CV=0.222) animals (Carretta *et al.* 2023). The minimum population estimate is 29,090 animals and the PBR is 279 (Carretta *et al.* 2023). The distribution and abundance of Pacific white-sided dolphins off California, Oregon and Washington varies considerably at both seasonal and interannual time scales (Forney and Barlow 1998, Becker *et al*. 2012, 2020, Barlow *2016*; all as cited in (Carretta *et al.* 2023) but no long-term trends have been identified.

Distribution: Pacific white-sided dolphins are one of the most abundant pelagic species of dolphin found in cold-temperate North Pacific waters. In the eastern Pacific they occur as far west as Amchitka Island in the central Aleutian Islands through the GOA and down to 20ºN, just south of Baja California (Black 2009). This species does not migrate but exhibits seasonal shifts in distribution related to oceanographic variability. Pacific white-sided dolphins are endemic to temperate waters of the North Pacific Ocean and are common both on the high seas and along the continental margins. Off the U.S. west coast, Pacific white-sided dolphins have been seen primarily in shelf and slope waters. Sighting patterns from recent aerial and shipboard surveys conducted in California, Oregon and Washington suggest seasonal north-south movements, with animals found primarily off California during the colder water months and shifting northward into Oregon and Washington as water temperatures increase in late spring and summer (Carretta *et al.* 2023). They typically inhabit productive continental shelf and slope waters generally within 185 km of shore (Black 2009), and frequent areas with complex bathymetry.

Behavior and Life History: As summarized from Black (2009) calving occurs from May to September. Age and length of maturation varies by area with females becoming sexually mature at 8-11 years with a 4- to 5-year calving interval. These are highly social dolphins and are avid bow riders that commonly occur in groups of less than a hundred but can form herds of over a thousand animals. They often associate with other dolphins typically Risso's, commons, and northern right-whale dolphins and

porpoises and occasionally feed near humpback whales. Killer whales (*Orcinus orca*) appear to be a significant predator. Prey species include cephalopods (30 species known to be consumed) and schooling fishes (at least 60 species) (Black 2009).

4.2.4. Risso's Dolphins

Description: Risso's dolphins are large dolphins with adults of both sexes reaching up to 4 m in length; there is no evidence of sexual dimorphism (Baird 2009). The anterior body is robust tapering to a relatively narrow tail stock with a relatively small dorsal fin. The bulbous head has a distinct vertical crease along the anterior surface of the melon (Baird 2009). Color patterns change with age; older animals are covered with linear scars and may appear whitish on the dorsal and lateral surfaces. The dorsal fin is falcate and black in color (Baird 2009). They are often confused with killer whales due to the large size of their dorsal fin.

Status and Trends: Risso's dolphins from the CA/OR/WA stock may be encountered by IPHC activities off the coasts of Washington, Oregon, and N. California. This stock is not listed under the ESA, nor is it considered to be depleted under the MMPA. As oceanographic conditions vary, Risso's dolphins may spend time outside the U.S. EEZ, and therefore a multi-year average abundance estimate is the most appropriate for management within U.S. waters. The most recent estimate of Risso's dolphin abundance is the geometric mean of estimates from 2008 and 2014 summer/autumn vessel-based line-transect surveys of California, Oregon, and Washington waters, 6,336 (CV=0.32) animals (Barlow 2016). The minimum population estimate is 4,817. The PBR for Risso's dolphins is 46 animals, and no long term trends in abundance have been identified (Carretta *et al.* 2023).

Distribution: Risso's dolphins exhibit a world-wide distribution in tropical and warm-temperate waters. Risso's dolphins are commonly seen on the continental shelf in the Southern California Bight and in continental slope and offshore waters off of California, Oregon and Washington (Carretta *et al.* 2023). Risso's dolphins that are observed off California during the colder water months are thought to shift northward into Oregon and Washington as the water warms in late spring and summer. They seem to prefer temperate and tropical waters in steep edged habitat between 400- and 1000-m deep. In the Pacific they can be found as far north as the GOA and the Kamchatka Peninsula and south to Tierra del Fuego and New Zealand (Baird 2009).

Behavior and Life History: As summarized in Baird (2009), Risso's dolphins are relatively gregarious, and typically travel in groups of 10-50 individuals; the largest group reported had over 4,000 individuals. They have been observed bow riding in front of gray whales and are often seen surfing in swells. Gestation is 13-14 months and calving intervals are about 2.4 years, with peak calving during winter in the ENP. Sexual maturity for females is thought to be 8-10 years of age and males 10-12 years of age. They feed almost exclusively on squid, likely at night (Baird 2009).

4.2.5. Common Bottlenose Dolphins

Description: Bottlenose dolphins are large animals that vary in color from light gray to charcoal. The common bottlenose dolphin is characterized by a medium-length stocky beak that is clearly distinct from the melon (Jefferson *et al.* 2008). The dorsal fin is tall and falcate. There are striking regional variations in body size, with adult lengths from 1.9 to 3.8 m (Wells and Scott 2009).

Status and Trends: Two stocks of common bottlenose dolphins are recognized in the western North Pacific Ocean: California coastal stock and CA/OR/WA offshore stock (Carretta *et al.* 2023). Only the latter stock might be encountered by IPHC research off the U.S. west coast. This stock is not listed under the ESA, nor is it considered to be depleted under the MMPA.

Bottlenose dolphins from the CA/OR/WA offshore stock have been found at distances of more than a few km offshore of Southern California Bight (Carretta *et al.* 2023). The current best abundance for this stock is taken as the estimate from 2018 or 3,477 (CV=0.696) animals (Carretta *et al.* 2023). PBR in U.S. waters for this stock is 19.7 dolphins per year. Habitat model-based estimates do not show any apparent trends (Becker *et al.* 2020).

Distribution: Bottlenose dolphins are distributed world-wide in tropical and warm-temperate waters that range from about 10 to 32° C. They inhabit temperate and tropical shorelines, adapting to a variety of marine and estuarine habitats, even ranging into rivers (Wells and Scott 2009). They are primarily coastal but do occur in pelagic waters, near oceanic islands and over the continental shelf. Oceanographic events appear to influence the distribution of animals along the coasts of California and Baja California as indicated by a change in residency patterns along Southern California and a northward range extension into central California after the 1982-83 El Niño has been shown (Carretta *et al.* 2023).

Sighting records off California and Baja California suggest that offshore bottlenose dolphins are continuous in these two regions; based on aerial surveys and shipboard surveys no seasonality in distribution is apparent (Carretta *et al.* 2023). Offshore bottlenose dolphins are not restricted to U.S. waters but cooperative management agreements with Mexico exist only for the tuna purse seine fishery and not for other fisheries that may take this species (*e.g.*, gillnet fisheries) (Carretta *et al.* 2023).

4.2.6. Common Dolphin

Description: As summarized in Perrin (2009), common dolphins are slender and moderately robust, with moderate length beaks and a tall slightly falcate dorsal fin. The beak is shorter than in long-beaked common dolphins, and the melon rises from the beak at a steeper angle. Short-beaked common dolphins are distinctively marked with a V-shaped saddle caused by a dip in the cape below the dorsal fin, yielding an hourglass pattern on the side of the body. The back is dark brownish-gray, the belly is white, and the anterior flank patch is tan to cream in color. The lips are dark, and there is a dark stripe from the eye to the apex of the melon and another one from the chin to the flipper (the latter is diagnostic to the genus). There are often variable light patches on the flippers and dorsal fin. Length ranges between about 2.3 m (females) and 2.6 m (males) (Perrin 2009).

Status and Trends: The CA/OR/WA stock of common dolphins might be encountered by IPHC research off the U.S. west coast. This stock is not listed under the ESA, nor is it considered to be depleted under the MMPA.

Common dolphins are the most abundant cetacean off California; they are widely distributed between the coast 300 nm offshore. As oceanographic conditions vary, short-beaked common dolphins may spend time outside the U.S. EEZ, and abundance estimates off California change on seasonal and interannual time scales. The best estimate of short-beaked common dolphin abundance is from 2018 of 1,056,308 (CV = 0.207) animals (Carretta *et al.* 2023). The minimum population estimate is 888,971 with a PBR of 8,889 dolphins per year. Abundance has been shown to increase during warm-water periods (Dohl *et al.*

1986, Forney and Barlow 1998, Barlow 2016; as cited in (Carretta *et al.* 2023). Estimated abundances increased beginning in 2014; the survey that year was conducted during extremely warm ocean conditions (Bond *et al*. 2015; as cited in (Carretta *et al.* 2023), and resulted in the largest abundance estimate since large-scale surveys began in 1991. The 2018 estimate is also elevated compared with earlier surveys. No habitat issues are known to be of concern for this species.

Distribution: Short-beaked common dolphins occur worldwide from about 40-60° N to about 50° S (Perrin 2009). Historically, they were reported primarily south of Pt. Conception but have been commonly recorded as far north as 42°N. The short-beaked common dolphin is found in coastal and offshore waters along the eastern Pacific coast from Peru to Vancouver Island. During summer and fall, short-beaked common dolphins primarily occur along the outer coast in waters deeper than 200 m and to a lesser extent in water depths between 100 m and 200 m. In winter and spring, animals typically stay south of the 13°C isotherm (Perrin 2009).

Behavior and Life History: Large pods of hundreds to thousands of individuals have been observed and are often associated with other marine mammal species (Perrin 2009). Gestation is 10-11.7 months with a calving interval of 1-3 years depending on location (Perrin 2009). Age at sexual maturity varies by region from 3 years to 7-12 years for males and 2-4 and 6-8 years for females. Cooler water populations exhibit more seasonality in reproduction (Perrin 2009). Data are limited on dive behavior but dives to 200 m are possible; most dives range from 9-50 m but foraging dives up to 200 m have been recorded off southern California (Perrin 2009).

4.2.7. Northern Right-Whale Dolphins

Description: Right-whale dolphins are slender, sleek dolphins known for their distinctive black and white color patterns and lack of a dorsal fin. The northern right-whale dolphin is mainly black with a white ventral patch that runs from the fluke notch to the throat region; there is another white patch on the ventral tip of the rostrum and the underside of the flipper (Lipsky 2009). They can grow to 3 m in length and 116 kg; and males tend to be larger than females.

Status and Trends: The CA/OR/WA tock of northern right whale dolphins might be encountered by IPHC research off the U.S. west coast. This stock is not listed under the ESA, nor is it considered to be depleted under the MMPA. As northern right-whale dolphins may spend time outside the U.S. EEZ, NMFS considers a multi-year average abundance estimate the most appropriate for management within U.S. waters. The most recent best-estimate of abundance is taken as the estimate from 2018, or 29,285 (CV=0.717) animals (Becker *et al.* 2020). PBR for this stock is 163 dolphins per year, and long term trends have not been identified (Carretta *et al.* 2023).

Distribution: Northern right-whale dolphins are endemic to temperate waters of the North Pacific Ocean. Off the U.S. west coast, they are primarily observed in shelf and slope waters (Carretta *et al.* 2023). Right-whale dolphins prefer cool temperate and subarctic waters in the North Pacific. They tend to be offshore oceanic cetaceans and are rarely observed inshore (Lipsky 2009). Barlow (2016) observed that these dolphins are found primarily off California during the colder water months and shift northward into Oregon and Washington as water temperatures increase in late spring and summer.

Behavior and Life History: Sexual maturity in northern right whale dolphins occurs at about 10 years of age (Lipsky 2009). Although calving seasonality is unknown, small calves are seen in winter and early

spring. They tend to be gregarious and travel in groups of up to 2,000-3,000 in the North Pacific. Males may attain sexual maturity between 212 and 220 cm in length and females at about 200 cm but few data are available on age, growth, and reproduction (Lipsky 2009). The diet primarily includes squid and mesopelagic fish. No dive data are available.

4.2.8. Beluga Whales

For a general description, and discussion of distribution, behavior and life history of beluga whales please see Section 4.1.7 of this application.

Status and Trends: Non-ESA-listed beluga whales from the Beaufort Sea, Eastern Chukchi Sea, Eastern Bering Sea and Bristol Bay stocks may be encountered by AFSC or IPHC research activities. These stocks are discussed below.

Beaufort Sea Stock – As reported in Young *et al.* (2023) Duval (1993) estimated that there were 21,000 beluga whales in the Beaufort Sea stock, similar to the number reported by Seaman *et al*. (1985; as cited in (Young *et al.* 2023). The most recent aerial survey conducted in July 1992 resulted in an estimate of 19,629 beluga whales (CV = 0.229) in the eastern Beaufort Sea (Harwood et al. 1996; as cited in (Young *et al.* 2023). To account for availability bias in this study, a correction factor of 2 was applied, resulting in a population estimate of 39,258 whales. However, the correction factor was determined to be negatively biased by the Alaska Scientific Review Group (Young *et al.* 2023). Additionally, the 1992 surveys did not encompass the entire summer range of Beaufort Sea beluga whales (Richard *et al.* 2001). Because the survey data is more than 8 years old, PBR is undetermined for this stock.

During summer 2019, the U.S. and Canada supported independent aerial line-transect surveys in the eastern Beaufort Sea to conduct an abundance survey for bowhead whales. Those data are also being analyzed to derive abundance estimates for the Beaufort Sea stock of beluga whales (Young *et al.* 2023).

Eastern Chukchi Sea Stock – Data from satellite tags attached to Eastern Chukchi Sea belugas indicate an overlap in distribution with the Beaufort Sea beluga stock during late summer. Analyses of satellite telemetry data from beluga whales belonging to the Eastern Chukchi Sea stock (Hauser *et al*. 2014; as cited in(Young *et al.* 2023) identified an area in the Beaufort Sea time period (19 July-20 August) when the two stocks did not overlap (Lowry *et al.* 2017). A geographically stratified line-transect analysis that was based on the assumption that the Beaufort Sea and Eastern Chukchi Sea stocks are geographically segregated from mid-July through August resulted in a population estimates Eastern Chukchi Sea beluga whales of 13,305 (CV=0.51) animals in 2017 (Givens *et al.* 2020). The estimate incorporates a correction factor of 1.85 (Lowry *et al.* 2017) for whales that were submerged and not visible and they do not account for whales that might have been outside the project area during the survey period. PBR for this stock is 178 beluga whales (Young *et al.* 2023).

There is debate as to whether the Eastern Chukchi Sea and Beaufort Sea stocks actually are isolated from each other. However, the Givens *et al.* (2020) abundance estimate reflects the best available data for Eastern Chukchi Sea beluga whales at this time.

Eastern Bering Sea Stock – The Eastern Bering Sea beluga whale stock remains in the Bering Sea but migrates south near Bristol Bay in winter and returns north to Norton Sound and the mouth of the Yukon River in summer (Lowry *et al.* 2019). The Alaska Beluga Whale Committee (ABWC) has been working

to develop a population estimate for the Eastern Bering Sea stock since the first systematic aerial surveys of the Norton Sound/Yukon River Delta region during May, June, and September 1992 and June 1993-1995 (Lowry *et al*. 1999; as cited in (Young *et al.* 2023). In 2000, systematic transect lines were flown covering the entire study region, and the data were analyzed using a multiple covariates distance-sampling line-transect model in a geographically stratified analysis. The resulting estimate of beluga whales present at the surface in the study area was 3,497 beluga whales (CV = 0.37) (Lowry *et al.* 2017). However, the 2000 abundance estimate was likely an underestimate (Young *et al.* 2023).

In 2017, ABWC and NMFS collaborated on an aerial line-transect survey for beluga whales in the Norton Sound/Yukon River Delta region. To estimate the number of beluga whales present at the surface throughout the entire 2017 survey area, Ferguson *et al*. (in prep.) used a line transect analysis analogous to Lowry *et al.* (2019); resulting in an estimate of 4,621 beluga whales (CV = 0.117). Applying an availability bias correction factor of 2.0 and a transect detection probability of 0.753 to the estimated 4,621 belugas at the surface results in a total abundance estimate for the Eastern Bering Sea beluga whale stock in 2017 of 12,269 (CV = 0.118) (Ferguson *et al.* in prep, as cited in (Young *et al.* 2023). PBR for the Eastern Bering Sea stock is 267 beluga whales (Young *et al.* 2023).

Bristol Bay Stock – The Bristol Bay stock of beluga whales is genetically distinct (Young *et al.* 2023). Using count data from surveys conducted in 2016 and applying correction factors that have been used in the past yields an estimated abundance of 2,040 beluga whales (CV = 0.26) in 2016 and PBR for this stock is 33 (Young *et al.* 2023).

4.2.9. Humpback Whales – Hawaii DPS

For a general description, and discussion of distribution, behavior and life history of humpback whales please see Section 4.1.2 of this application. Non-ESA-listed humpback whales from the Hawaii DPS may be encountered by AFSC and IPHC research activities.

Status and Trends: Data from multiple line-transect surveys since 2002 have been used to develop and update species distribution models for cetaceans within the U.S. EEZ around the Hawaiian Islands (Becker *et al*. 2012, 2021; Forney *et al*. 2015; as cited in (Young *et al.* 2023), but these surveys primarily took place in summer and fall. Becker *et al.* (2022; as cited in (Young *et al.* 2023) used 2002-2020 survey data, along with environmental variables, to estimate the density and abundance of humpback whales in the Hawaiian Islands EEZ for recent years (2017-2020). The resulting estimate of abundance is 11,278 (CV = 0.56), which is considered the best current estimate of abundance for Hawai‘i and for the stock as a whole (Becker *et al*. 2022; as cited in (Young *et al.* 2023). PBR is 127 whales.

4.2.10. Gray Whales – ENP Stock

Description: The gray whale is a robust, slow-moving whale recognized by a mottled gray color with numerous light patches scattered along the body and lack of a dorsal fin (Jones and Swartz 2009). Their baleen is short (5-40 cm) and cream-white to yellow in color. Adults are 10-15 m long and weigh between 16 and 45 tons. At birth, the calves are 5 m long and weigh close to 450 kg (Jones and Swartz 2009). Both male and female gray whales reach sexual maturity when they are between five and 11 years old, with the average being eight years (Rice *et al.* 1984).

Status and Trends: Gray whales from the ENP stock are not listed under the ESA and the stock is not considered strategic or depleted under the MMPA. The most recent estimate of abundance for the ENP population is from the 2015/2016 southbound survey and is 26,960 (CV=0.05) whales (Durban *et al.* 2017; as reported in (Carretta *et al.* 2023). PBR for the stock is the default recovery factor of 0.5 animals per year (Carretta *et al.* 2023).

ENP gray whales experienced an unusual mortality event (UME) beginning in 2019 (which is ongoing), when large numbers of whales stranded from Mexico to Alaska[11]. Necropsies conducted on a subset of stranded whales indicated that many animals showed evidence of nutritional stress. NOAA is coordinating an independent team of scientists to review the stranding data and samples as part of the Working Group on Marine Mammal Unusual Mortality Events. NOAA continues to monitor the gray whale population through abundance and calf production surveys.

Distribution and habitat Preference: The gray whale migration covers 8,000-10,000 km each way (Rugh and Fraker 1981), and is perhaps the longest migration of any mammalian species. Most eastern ENP gray whales spend the summer in the shallow waters of the northern and western Bering Sea and in the adjacent waters of the Arctic Ocean. However, some remain throughout the summer and fall along the Pacific coast as far south as southern California (Carretta *et al.* 2023). Gray whales are by far the most coastal of all the great whales, and inhabit primarily inshore or shallow, offshore continental shelf waters of the North Pacific. They tend to be nomadic, highly migratory, and tolerant of climate extremes (Jones and Swartz 2009).

Behavior and Life History: Female gray whales usually breed once every two years. The breeding season is limited primarily to a three-week period in late November and early December near the start of the southward migrations. However, if no conception occurs at that time, a second estrus cycle can occur within 40 days (Rice *et al.* 1984), such that a few females may breed as late as the end of January on the winter grounds (Jones and Swartz 2009) (Jones and Swartz 2009). Gray whale calves are born in the winter after a gestation period of about 13.5 months. Killer whale predation may be the most significant cause of mortality (Jones and Swartz 2009). When feeding gray whales typically use shallow areas close to shore for herring eggs and larvae, crab larvae, ghost shrimp, amphipods and crustaceans.

4.2.11. Killer Whales

For a general description, and discussion of distribution, behavior and life history of killer whales please see Section 4.1.8 of this application.

Status and Trends: Non-ESA-listed killer whales from the six stock discussed below may be encountered by AFSC and IPHC research activities.

ENP Northern Resident – This stock is a transboundary stock that frequents British Columbia, Canada, and Southeast Alaska waters (Dahlheim *et al*. 1997, Ford *et al*. 2000; as cited in (Young *et al.* 2023). They have been seen infrequently in Washington State waters. Members of the Northern Resident population have been documented in Southeast Alaska; however, they have not been seen to intermix with ENP Alaska Residents (Young *et al.* 2023). For 2018, the total best population size was estimated at

[11] https://www.fisheries.noaa.gov/national/marine-life-distress/2019-2023-gray-whale-unusual-mortality-event-along-west-coast-and Accessed August 8, 2023

302 individuals (range = 302 to 310) and PBR is 2.2 animals (Young *et al.* 2023). Towers *et al*. (2015; as cited in (Young *et al.* 2023) reported an average annual increase of 2.2% in this stock over a 40-year time series. However, annual Northern Resident killer whale population growth rates have slowed from 5.1% in 2014 to -0.3% in 2018 (Fisheries and Oceans Canada 2019; as cited in (Wade *et al.* 2011).

West Coast Transient – This stock occurs from California through Southeast Alaska; it is considered to be a trans-boundary stock and includes killer whales from British Columbia waters (Young *et al.* 2023). Towers *et al*. (2019; as cited in (Young *et al.* 2023) examined a 61-year archive of photo-identification data (1958-2018) to produce a population estimate subset for this stock of 349 individuals. Because the data focused on Canadian waters, this estimate should be considered a minimum count for the West Coast Transient stock (Young *et al.* 2023). PBR for the stock is 3.5 whales. Given that population estimates are based on photo identification of individuals and are considered to be minimum estimates, no reliable assessments of population trends are available (Young *et al.* 2023).

ENP Offshore – This stock occurs from California through Alaska waters. A population size of 300 ENP offshore killer whales has been estimated using photo-ID mark-recapture methods (CV=0.10). This estimate includes marked and unmarked individuals encountered from 1988-2012 (Ford *et al.* 2014; as cited in (Carretta *et al.* 2023). PBR is 2.8. The population trajectory for this stock of killer whales is described as stable by Ford *et al.* (2014); as cited in Carretta, 2023 #3068}.

AT1 Transient – This stock is found in Alaskan waters from Prince William Sound through the Kenai Fjords (Young *et al.* 2023). While the AT1 Transient stock is not listed as threatened or endangered under the ESA, it is considered to be a depleted and strategic stock under the MMPA.

The abundance estimate for this stock is a direct count of individually identifiable animals. Only 11 whales were seen between 1990 and 1999; since then, 4 of those whales have not been seen over 4 or more consecutive years. Therefore Young *et al.* (2023) and citations therein, estimate N_{MIN} for the stock as 7 whales; PBR is 0.01. Because 14 years of annual efforts have failed to identify any not previously seen whales there is no reason to believe there are additional whales in the population, and N_{MIN} is considered to be the total population size. Population counts for this stock have declined from 22 whales in 1989 to 7 whales since 2003, a decline of 68%. Most of the mortality apparently occurred in 1989 and 1990, following the *Exxon Valdez* oil spill (Young *et al.* 2023).

ENP GOA, Aleutian Islands, and Bering Sea Transient – This stock occurs mainly from Prince William Sound through the Aleutian Islands and Bering Sea (Young *et al.* 2023). Combining counts from the Aleutian Islands and Bering Sea (451) with those from the GOA (136), a total count of 587 individual whales have been identified in catalogues of this stock and PBR is 5.9.(Young *et al.* 2023). Matkin *et al*. (2012; cited in (Young *et al.* 2023) reviewed photographic data collected since 1984 and determined GOA transients have exhibited stable numbers. However, reliable data on trends in for the Aleutian Islands and Bering Sea portion of this stock are not available.

ENP Alaska Resident – This stock occurs from Southeast Alaska to the Aleutian Islands and Bering Sea (Young *et al.* 2023). According to Young *et al.* (2023), there are 921 unique identified individual whales from this stock in the GOA. The estimates were made from studies of different pods occurring from 2005 to 2019. For the years 2001 to 2010, 999 unique identified individuals were estimated for the Aleutian Islands and Bering Sea. As per Young *et al.* (2023), combining those two counts results in a total for

Alaska of 1,920 ENP Alaska resident killer whales. PBR for the stock is determined to be 19. At present, reliable data on trends in population abundance for the entire Alaska Resident stock of killer whales are unavailable due to a lack of trend data from the Aleutian Islands and Bering Sea Young *et al.* (2023).

4.2.12. Short-Finned Pilot Whales

Description: Short-finned pilot whales are black or dark gray, with a robust body and thick tailstock. The melon is exaggerated and bulbous and there is either no beak or a barely discernable one (Olson 2009). The species exhibits sexual dimorphism with adult males being larger than females (average length 6 m) and the broad-based dorsal fin of a male is larger than that of a female (Olson 2009).

Status and Trends: The CA/OR/WA stock of northern right whale dolphins might be encountered by IPHC research off the U.S. west coast. This stock is not listed under the ESA, nor is it considered to be depleted under the MMPA.

The abundance of short-finned pilot whales along the west coast of the U.S. is variable and influenced by prevailing oceanographic conditions. After the strong El Niño event that occurred in1982-83, short-finned pilot whales virtually disappeared from the U.S. west coast; despite increased survey efforts in the region, sightings and fishery takes are rare and have primarily occurred during warm-water years (Julian and Beeson 1998, Carretta *et al.* 2004 as cited in (Carretta *et al.* 2023), and (Barlow 2016). The most recent estimate of short-finned pilot whale abundance based on 2008 and 2014 summer/autumn vessel-based line-transect surveys of California, Oregon, and Washington waters is 836 (CV=0.79) animals (Carretta *et al.* 2023). This estimate includes new correction factors for animals missed during the surveys. The minimum population estimate is 466 and the PBR is calculated as 4.5 whales per year (Carretta *et al.* 2023). It is not known whether the animals observed more recently are part of the same population that was documented off Southern California before the mid-1980s or belong to a different, wide-ranging pelagic population. Therefore, no inferences can be drawn regarding trends in abundance of short-finned pilot whales off California, Oregon and Washington (Carretta *et al.* 2023).

Distribution: The short-finned pilot whale is found in tropical to warm temperate seas. It usually does not range north of 50° N or south of 40° S (Olson 2009). Along the west coast of North America, sightings of short-finned pilot whales north of Point Conception are uncommon but there are infrequent sightings off Oregon and Washington. Worldwide, pilot whales usually are found over the continental shelf break, in slope waters, and in areas of high topographic relief but movements over the continental shelf and close to shore near oceanic islands can occur (Olson 2009).

Behavior and Life History: Pilot whales are very social and may travel in pods of up to hundreds of animals; they may often occur with other cetaceans. The groups are relatively stable and female based (Olson 2009). Sexual maturity occurs at 9 years for females and 17 years for males. The mean calving interval is 4 to 6 years (Olson 2009). Pilot whales are deep divers; the maximum dive depth measured is about 971 m (Baird *et al.* 2002). Short-finned pilot whales feed on squid and fish. Stomach content analysis of pilot whales in the Southern California Bight consisted entirely of cephalopods (Olson 2009). The most common prey item identified is *Loligo opalescens*, which has been documented in spawning concentrations at depths of 20-55 m.

4.2.13. Baird's Beaked Whales

Description: Baird's beaked whales are one of the largest members of the family Ziphiidae. The entire body is dark brown with the ventral side paler with irregular white patches; tooth marks of conspecifics are numerous on the back, particularly on adult males (Kasuya 2009). The body is slender with a small head, low falcate dorsal fin and small flippers that fit into depressions on the body. The melon is small and its front surface is almost vertical with a slender projecting rostrum. Mean body length of whales 15 years or older are 10.5 m in females and 10.1 m in males.

Status and Trends: There are two recognized stocks found in the North Pacific: the Alaska stock and the CA/WA/OR stock. Neither stock is listed under the ESA nor are they considered depleted under the MMPA. The CA/OR/WA stock might be affected by IPHC research activities off the U.S. west coast, while research by AFSC and IPHC in Alaskan waters may encounter individuals from the Alaskan Stock. research activities.

Alaska Stock - Reliable estimates of abundance for this stock are currently unavailable (Young *et al.* 2023).

CA/OR/WA Stock - The best estimate of abundance is taken as the most-recent estimate for 2018 from habitat-based species distribution models, or 1,363 (CV=0.533) whales (Carretta *et al.* 2023). The population of Baird's beaked whales off of the U.S. west coast has remained stable or increased slightly, based on a Bayesian trend analysis by Moore and Barlow (2017, as cited in (Carretta *et al.* 2023).

Distribution: The Alaska stock ranges from north from Cape Navarin and the central Sea of Okhotsk to St. Matthew Island, the Pribilof Islands in the Bering Sea, and the northern GOA (Rice 1986, Rice 1998, Kasuya 2002; as cited in (Young *et al.* 2023). Along the U.S. west coast, Baird's beaked whales have been seen primarily along the continental slope from late spring to early fall. They have been seen less frequently and are presumed to be farther offshore during the colder water months of November through April (Carretta *et al.* 2023). The area of highest utilization for this whale in the ENP is in waters deeper than 500 m deep. The area of lower utilization is between 200 m to 500 m water depth. They rarely occur in waters shallower than 200 m (Carretta *et al.* 2023).

Behavior and Life History: Baird's beaked whales occur in relatively large groups of 6 to 30, and groups of 50 or more sometimes are seen (Kasuya 2009). Sexual maturity occurs at about 8 to 10 years, and the calving peak is in March and April (Kasuya 2009). Mating generally occurs in October and November but little else is known of their reproductive behavior (Kasuya 2009). They feed mainly on benthic fish and cephalopods, but prey also includes pelagic fish such as mackerel, sardine, and saury (Walker *et al.* 2002). Baird's beaked whales in Japan prey primarily on deepwater gadiform fishes and cephalopods, indicating that they feed primarily at depths ranging from 800 to 1,200 m (Walker *et al.* 2002). Baird *et al.* (2006) reported on the diving behavior of four Blainville's beaked whales (a similar species) off the west coast of Hawaii. The four beaked whales foraged in deep ocean areas with a maximum dive to 1,407 m. Dives ranged from at least 13 minutes to a maximum of 68 minutes.

4.2.14. Cuvier's Beaked Whales

Description: Cuvier's beak whale resembles other beaked whales in that it has a robust, cigar-shaped body with a smallish falcate dorsal fin set about two thirds back; the small flippers fit into a slight

depression as with other beaked whales (Heyning and Mead 2009). The head is blunt with a small poorly defined rostrum that grades into a generally sloping melon region (Heyning and Mead 2009). Minimum length at sexual maturity is 5.3 m for females and 5.3 m for males.

Status and Trends: There are two recognized stocks found in the North Pacific: the Alaska stock and the CA/WA/OR stock. Neither stock is listed under the ESA nor are they considered depleted under the MMPA. The CA/OR/WA stock might be affected by IPHC research activities off the U.S. west coast, while research by AFSC and IPHC in Alaskan waters may encounter individuals from the Alaskan Stock. research activities.

Alaska Stock - Reliable estimates of abundance for this stock are currently unavailable (Young *et al.* 2023).

CA/OR/WA Stock - Although Cuvier's beaked whales have been sighted along the U.S. west coast during vessel-based line transect surveys utilizing both aerial and shipboard platforms, the rarity of sightings has historically ruled out reliable population estimates (Carretta *et al.* 2023). A trend-based analysis of line-transect data from surveys conducted between 1991 and 2014 provided a range of estimates from 2,242 to 4,860 Cuvier's beaked whales with coefficients of variation between 0.59 and 0.67 (Moore and Barlow 2017; as cited in (Carretta *et al.* 2023). However, Barlow *et al*. (2021; as cited in (Carretta *et al.* 2023) developed new acoustic methods for estimating Cuvier's beaked whale density and abundance. The authors They estimated the abundance of Cuvier's beaked whales in 2016 to be 5,454 whales (CV=0.27, 95), which is higher than any previous line-transect estimate and has better precision (Carretta *et al.* 2023). PBR for the stock is 42 whales per year (Carretta *et al.* 2023).

Distribution: Cuvier's beaked whales are distributed in all oceans and seas except the high polar regions. they are usually observed in waters >200 m deep, and are frequently recorded at depths >1,000 m. They are commonly sighted around seamounts, escarpments, and canyons (Heyning and Mead 2009). Waters deeper than 1,000 m are the area of highest utilization for the Cuvier's beaked whale in the Northeast Pacific while water depths between 500 m and 1,000 m are less utilized. Occurrence in waters shallower than 500 m is rare (Department of the Navy (DON 2008)).

Behavior and Life History: Little is known of the feeding preferences of Cuvier's beaked whales. They may feed on cephalopods and rarely fish at mid-water and bottom depths (Heyning and Mead 2009). There is little information on beaked whale reproductive behavior (Heyning and Mead 2009). Studies by Baird *et al.* (2006) show that Cuvier's beaked whales are deep (maximum of 1,450 m) and long (maximum dive duration of 68.7 minutes) divers but also spent time at shallow depths. Tyack *et al.* (2006) has also reported deep diving for Cuvier's beaked whales with mean depths of 1,070 m and mean durations of 58 min.

4.2.15. Other Beaked Whales – Mesoplodon sp.

Description: There are six species mesoplodonts that are known to occur off the U.S. west coast where they may be encountered by IPHC activities: Blainville's beaked whale (*M. densirostris*), Perrin's beaked whale (*M. perrini*), Lesser beaked whale (*M. peruvianus*), Stejneger's beaked whale (*M. stejnegeri*), Gingko-toothed beaked whale (*M. gingkodens*), and Hubbs' beaked whale (*M. carlhubbsi*) (Mead 1989, Henshaw *et al.* 1997, Dalebout *et al.* 2002, MacLeod *et al.* 2006; all as cited in (Carretta *et al.* 2023).

The *Mesoplodon* genus exhibits defining characteristics, in particular relating to their skulls[12]. They have a long rostrum, which creates a beaked appearance. Among species, rostrums vary in shape, size, and teeth placement. Mesoplodonts have one triangular dorsal fin situated about two-thirds down their spindle-shaped body. They have small narrow flippers. Species in this genus are smaller in size compared to other whales. They range in size range between 3.9 and 6.2 m. There is not enough data to know if size variations are based on sex.

Status and Trends: No mesoplodonts are listed under the ESA nor are they considered depleted under the MMPA. They are managed as a single stock due to difficulty in distinguishing among them (Carretta *et al.* 2023). A trend-based analysis of line-transect data from surveys conducted between 1991 and 2014 provided estimates of *Mesoplodon* species abundance (Moore and Barlow 2017; as cited in (Carretta *et al.* 2023). The best estimate of Mesoplodon abundance in waters off of California Oregon and Washington is 3,044 (CV= 0.54) as represented by the model-averaged estimate for 2014; PBR is 20 (Carretta *et al.* 2023).

Distribution: Mesoplodont beaked whales are distributed throughout deep waters and along the continental slopes of the North Pacific Ocean (Carretta *et al.* 2023). Insufficient sighting records exist off the U.S. west coast to determine any possible spatial or seasonal patterns in the distribution of mesoplodont beaked whales.

Behavior and Life History: Beaked whales are rapid swimmers and deep divers[13]. Mesoplodonts are polyandrous or polygynous maters. Generally, females give birth to a single offspring per calving event. Many species within the Mesoplodon species mate according to breading hierarchies that are created through the intraspecies fighting among males[14]. Mesoplodonts consume mesopelagic squid and fish. They have been shown to catch prey at depths >200 m using echolocation (Pitman 2009).

4.2.16. Minke Whales

Description[15]: Minke whales are members of the baleen or "great" whale family and are the smallest of the rorquals. have a relatively small, dark, sleek body that can reach lengths of up to ~11 m and weigh up to ~9 metric tons. Females may be slightly larger than males. Minke whales have a fairly tall, sickle-shaped dorsal fin located about two-thirds down their back. Their body is black to dark grayish/brownish, with a pale chevron on the back behind the head and above the flippers, as well as a white underside. Calves are usually darker in color than adults. Minke whales have 230 to 360 short, white/cream colored baleen plates on each side of the mouth.

Status and Trends: There are two recognized stocks found in the North Pacific: the Alaska stock and the CA/WA/OR stock. Neither stock is listed under the ESA nor are they considered depleted under the MMPA. The CA/OR/WA stock might be affected by IPHC research activities off the U.S. west coast, while research by AFSC and IPHC in Alaskan waters may encounter individuals from the Alaskan Stock. research activities.

[12] https://animaldiversity.org/accounts/Mesoplodon/ Accessed August 9, 2023.
[13] https://www.britannica.com/animal/beaked-whale Accessed August 9, 2023.
[14] https://animaldiversity.org/accounts/Mesoplodon/ Accessed August 9, 2023.
[15] https://www.fisheries.noaa.gov/species/minke-whale Accessed August 9, 2023.

Alaska Stock - Visual surveys for cetaceans were conducted on the eastern Bering Sea shelf in 2002, 2008, and 2010 (Friday *et al.* 2013; as cited in (Young *et al.* 2023). Results of the surveys in 2002, 2008, and 2010 provided provisional abundance estimates of 389 (CV = 0.52), 517 (CV = 0.69), and 2,020 (CV = 0.73) minke whales on the eastern Bering Sea shelf, respectively. These estimates are considered provisional because they have not been corrected for animals missed on the trackline, animals submerged when the ship passed, or responsive movement. Additionally, line-transect surveys were conducted in shelf and nearshore waters in 2001-2003 from the Kenai Fjords in the GOA to the central Aleutian Islands. Minke whale abundance was estimated to be 1,233 (CV = 0.34) for this area (Zerbini *et al.* 2006). This estimate has also not been corrected for animals missed on the trackline. The majority of the sightings were in the Aleutian Islands, rather than in the GOA, and in water shallower than 200 m. Very few minke whales were seen during three offshore GOA surveys for cetaceans in 2009, 2013, and 2015 such that a population estimate for the species in this area could not be determined (Rone *et al*. 2017; as cited in Young, 2023 #2826}. In total, these estimates cannot be used as an estimate of the entire Alaska stock of minke whales because only a portion of the stock's range was surveyed and the abundance remains unknown for this stock Young, 2023 #2826}. Because an estimate of minimum abundance is not available, the PBR for the Alaska minke whale stock is also unknown.

CA/OR/WA Stock - The best estimate of abundance for the CA/OR/WA stock is 915 (CV=0.792) animals, taken from 2018 surveys (Becker *et al.* 2020). The minimum population estimate is 509 whales, and the calculated PBR for this stock is 4.1 whales (Carretta *et al.* 2023). No apparent trends in population size are evident for this stock from a series of abundance estimates generated over the period 1991-2018 (Carretta *et al.* 2023).

Distribution: Minke whales prefer temperate to boreal waters but are also found in tropical and subtropical areas. They feed most often in cooler waters at higher latitudes and can be found in both coastal/inshore and oceanic/offshore areas[16]. In the Pacific, minke whales are usually seen over continental shelves (Brueggeman *et al*. 1990; as cited in (Carretta *et al.* 2023). In extreme north latitudes, minke whales are believed to be migratory, but in inland waters of Washington and in central California they appear to establish home ranges (Dorsey *et al*. 1990; as cited in (Carretta *et al.* 2023)). In Alaska waters, minke whales are relatively common in the Bering and Chukchi seas and in the inshore waters of the GOA (Moore *et al*. 2000, Friday *et al*. 2012, Clarke *et al*. 2013; as cited in (Young *et al.* 2023).

Behavior and Life History[17]: Minke whales feed by lunging sideways into schools of prey and gulping large amounts of water. They opportunistically feed on crustaceans, plankton, and small schooling fish (*e.g.*, anchovies, dogfish, capelin, coal fish, cod, eels, herring, mackerel, salmon, sand lance, saury, and wolfish). These whales can dive for at least 15 minutes but regularly submerge for 6 to 12 minutes at a time. Minke whales are often active at the surface and are commonly seen breaching.

Minke whales become sexually mature at around 3 to 8 years of age. Mating and calving likely occurs during the winter, and after a gestation period of 10 to 11 months, females give birth to a single calf that is about 8 to 11.5 feet in length and weighs 700 to 1,000 pounds. The calf is weaned from nursing after 4

[16] https://www.fisheries.noaa.gov/species/minke-whale Accessed August 9, 2023.
[17] https://www.fisheries.noaa.gov/species/minke-whale Accessed August 9, 2023.

to 6 months. The reproductive interval for females is estimated at 10 to 11 months, but calving may occur annually. They can live up to 50 years.

4.2.17. California Sea Lion

Description: California sea lions are highly sexually dimorphic; males weigh approximately 350 kg and are about 2.4 m long as compared to females which are about 100 kg and 1.8 m (Heath and Perrin 2009). Male and female pups weigh 6-9 kg. Adult males are usually dark brown but can range from light brown to black; females are dark brown to black (Heath and Perrin 2009). Males typically have a distinguishing sagittal crest on top of the head often topped with white fur.

Status and Trends: California sea lions in the U.S. are not listed as endangered or threatened under the ESA or as strategic or depleted under the MMPA. They may be encountered during IPHC activities off the coasts of northern California, Oregon and Washington. The California sea lion population was estimated from 1975-2014 time series pup counts (Lowry *et al*. 2017; as reported in (Carretta *et al.* 2023), along with mark-recapture estimates of survival rates (DeLong *et al*. 2017, Laake *et al.* 2018; as reported in (Carretta *et al.* 2023). Population size along the U.S. west coast was estimated in 2014 to be 257,606 animals, corresponding to a pup count of 47,691 animals (Carretta *et al.* 2023). The minimum population size is 233,515 animals and the PBR is 14,011 California sea lions per year (Carretta *et al.* 2023).

Declines in California sea lion survival rates survival have been attributed to warming oceanographic conditions that limit prey availability to pregnant and lactating females (DeLong *et al*. 2017; as cited in (Carretta *et al.* 2023). Elevated strandings of California sea lion pups have been occurring in Southern California since January 20118. This event was declared a UME specifically for pup and yearling California sea lions (Carretta *et al.* 2023). NMFS identified changes in the availability of sardines to be a contributing factor to the large number of strandings.

Distribution and Habitat Preferences: California sea lions breed on islands located in southern California, western Baja California, and the Gulf of California (Carretta *et al.* 2023). In response to changes in prey availability their distribution shifts to the northwest in fall and to the southeast during winter and spring (Carretta *et al.* 2023). In the non-breeding season, adult and subadult males migrate northward along the coast to central and northern California, Oregon, Washington, and Vancouver Island, and return south the following spring. Males are occasionally sighted well offshore, while females and juveniles tend to stay closer to the rookeries. They also enter bays, harbors, and river mouths and often haul out on man-made structures such as piers, jetties, offshore buoys, and oil platforms (Riedman 1990). California sea lions in the Puget Sound haul out on log booms and U.S. Navy submarines, and are often seen rafted off river mouths (Jeffries *et al.* 2000). They are occasionally sighted up to several hundred kilometers offshore. California sea lions frequently travel up river systems in search of prey, and are common at Bonneville Dam, 230 miles upriver from the mouth of the Columbia River (NMFS 2016b), where they consume migrating salmon during winter and spring.

Behavior and Life History: California sea lion numbers ashore increase rapidly in May when males establish breeding territories. Birth to a single pup occurs between May and June, and pups are weaned in about 10-12 months (Heath and Perrin 2009). While near rookeries in California, females typically feed

[18] https://www.fisheries.noaa.gov/national/marine-life-distress/2013-2017-california-sea-lion-unusual-mortality-event-california

over the continental shelf, traveling within 54 km from the islands though they are known to travel as far north as Monterey Bay to feed during the breeding season (Antonelis *et al.* 1990; Melin and DeLong 2000, as cited in Heath and Perrin (2009). California sea lions feed primarily on Pacific whiting, Pacific herring, salmonids, dogfish sharks, and squid. Dives off rookeries in California typically last about 2 mins but can be as long as 10 mins; dive depths average about 26-98 m but can be well over 200 m (Heath and Perrin 2009). Females are known to dive to a maximum depth of 482 m for up to 16 mins while foraging during the non-breeding period (Melin *et al.* 2008).

4.2.18. Steller Sea Lion Eastern DPS

For a general description, and discussion of distribution, behavior and life history of Steller sea lions please see Section 4.1.12 of this application.

Status and Trends: On 4 December 2013, the eastern DPS of Steller sea lions was removed from the list of threatened species under the ESA; therefore NMFS does not consider this stock to be depleted under the MMPA (Young *et al.* 2023). They may be encountered in fisheries research activities occurring in Southeast Alaska and U.S. west coast waters. Southeast Alaska was surveyed in June and July 2017 (Sweeney *et al.* 2017; NMFS, unpubl. Data; as cited in (Young *et al.* 2023); counts used in population analyses for the contiguous U.S. are from surveys conducted in 2014 in Washington coastal waters (NMFS and Washington Department of Fish and Wildlife, unpubl. Data as cited in (Young *et al.* 2023), and 2017 surveys of Oregon and California waters (NMFS and Oregon Department of Fish and Game, unpubl. Data as cited in (Young *et al.* 2023). The total count estimate of pups and non-pups for the U.S. portion of the eastern stock of Steller sea lions (excluding Canada) is 43,201 (32,510 non-pups plus 10,691 pups). This is considered to be N_{MIN} and PBR for the DPS is 2,592 (Young *et al.* 2023). Population This model indicates the eastern stock of Steller sea lions increased at a rate of 4.25% per year between 1987 and 2017 based on an analysis of pup counts in California, Oregon, Washington, British Columbia, and Southeast Alaska (Young *et al.* 2023).

4.2.19. Northern Fur Seals

Description: The northern fur seal is moderate in size and shows marked sexual dimorphism; males are two to three times larger than females. Northern fur seal males weigh 200-250 kg and are up to 1.9 m long; females weigh up to 45 kg and are 1.3 m long. Pups are black, weigh about 10 kg and are about 0.6 m long at birth (Gentry 2009). The under-fur is brown, very dense, and covered by coarser guard hair that in males varies from black to reddish with a mane over the shoulders that is often a different color; females are typically brown to gray and lack the mane (Gentry 2009).

Status and Trends: Two separate stocks of northern fur seals are recognized within U.S. waters: a Pribilofs/Eastern Pacific stock and a California stock (Carretta *et al.* 2023, Young *et al.* 2023). Neither stock is listed under the ESA nor are they considered depleted under the MMPA. The California stock might be affected by IPHC research activities off the U.S. west coast, while research by AFSC and IPHC in Alaskan waters may encounter individuals from the Pribilofs/Eastern Pacific stock.

Pribilofs/Eastern Pacific Stock – The Eastern Pacific stock breeds in Alaska waters and adult females and pups move into the North Pacific Ocean and often to the waters offshore of Oregon and California

(Young *et al.* 2023). The most recent estimate for the Eastern Pacific stock is 626,618 northern fur seals with a minimum population estimate of 530,376 and a PBR of 11,403 (Young *et al.* 2023)

California Stock – The most recent population estimate for the entire stock of California northern fur seals, which incorporates estimates from San Miguel Island and the Farallon Islands in 2013, is 14,050 (Carretta *et al.* 2023). The total minimum population size is 7,524 northern fur seals and the PBR for the stock is 451 animals per year (Carretta *et al.* 2023).

Distribution: During the breeding season, approximately 45% of the worldwide population of harbor seals is found on the Pribilof Islands in the southern Bering Sea, with the remaining animals spread throughout the North Pacific Ocean (Gelatt *et al*. 2015; as cited in (Carretta *et al.* 2023). Of the seals in U.S. waters outside of the Pribilofs, approximately 9% of the population is found on Bogoslof Island in the southern Bering Sea, 1% on San Miguel Island off southern California, and 0.3% on the Farallon Islands off central California (Gelatt *et al*. 2015; as cited in (Carretta *et al.* 2023).

The subpolar continental shelf and shelf break from the Bering sea to California provide feeding grounds for the seals while out at sea. Highest fur seal densities in the open ocean occur in association with major oceanographic frontal features such as sea mounts, valleys, canyons and along the continental shelf break (NMFS 2007). Fur seals from San Miguel Island may also spend their winter months feeding at sea in the ENP Ocean. Northern fur seals are primarily pelagic in the winter months but occasionally haul-out onto land for brief periods.

Behavior and Life History: Northern fur seals are the most pelagic of pinnipeds with females spending all but 35 days per year at sea and males 45 days (Gentry 2009). From November to March, they remain north of about 35° N latitude without coming ashore. In March and April, they gather along continental shelf breaks and begin to migrate to their respective breeding islands. Males come ashore and acquire breeding territories in late May and June and most pups are born in July, nursed for about 4 months and weaned in October or November. They are a highly migratory species and typically return to their natal sites to breed (Gentry 2009).

Rockfishes, northern anchovy, and squid were prominent in fur seal stomachs off Washington during February and March (NMFS 2007). Dive behavior of northern fur seals is well studied and shows that females from the Pribilof Islands often dive to 200 m or more for at least 5-6 mins with some as long as 11 mins. Similar foraging behavior has been documented for fur seals foraging from San Miguel Island, California (Gentry 2009).

4.2.20. Northern Elephant Seals

Description: Northern elephant seals are the largest pinniped in U.S. west coast waters. The species is sexually dimorphic with males weighing about 1,800 kg with a length of 4.8 m; females weigh about 900 kg and are about 2.5 m in length (Hindell 2018). Males have a large inflatable proboscis and a pronounced chest shield associated with fighting with other males on land to acquire females. Females lack the proboscis and chest shield. Both males and females are gray to brown in color.

Status and Trends: Elephant seals are not listed as either threatened or endangered under the ESA, nor designated as depleted under the MMPA.

Elephant seal population size is typically estimated by counting the number of pups produced and multiplying by the inverse of the expected ratio of pups to total animals. Based on counts of elephant seals at U.S. rookeries in 2010, Lowry *et al.* (2014; as cited in (Carretta *et al.* 2023) reported that 40,684 pups were born and applied a multiplier of 4.4 to extrapolate from total pup counts to a population estimate of approximately 179,000 elephant seals at that time. Lowry *et al*. (2020; as cited in (Carretta *et al.* 2023) extrapolated from total births to a statewide population estimate of 187,386 (95% CI 161,876 – 214,418). This correction factor is based on life table data on elephant seal fecundity and survival rates, where approximately 23% of the population represents pups (Carretta *et al.* 2023). PBR for the stock is 5,122 animals.

Distribution and Habitat Preferences: After the breeding season, immature and adult male northern elephant seals move northward to feed from Baja California to northern Vancouver Island and far offshore of the GOA and Aleutian Islands; adult females typically feed in the western North Pacific (Carretta *et al.* 2023). Northern elephant seals breed at about 15 colonies on the mainland and on islands off the California coast from the Farallon Islands, CA, south to islands off Mexico during winter. When not on the islands to breed or molt they tend to occur in deep offshore waters from central California north to the Aleutian Islands and west to Japan. Females tend to go farther northwest and males farther north (Hindell 2018). However, it is not uncommon to see male and female northern elephant seals hauled out on land alongside harbor seals, California and Steller sea lions, and northern fur seals throughout the North Pacific.

Behavior and Life History: Adult males haulout onto deserted beaches in November/December; adult females arrive soon thereafter, and a single pup is born about 2-5 days later. Elephant seals are highly polygynous with large dominant males presiding over large aggregations of females, known as harems consisting of up to 100 animals (Hindell 2018). Males feed near the eastern Aleutian Islands and in the GOA, and females typically feed south of 45° N latitude. Elephant seals prey on deepwater and bottom dwelling organisms, including fish, squid, crab, and octopus. They are extraordinary divers with some dive depths exceeding 1,500 m and 120 minutes (Hindell 2018).

4.2.21. Harbor Seals

Description: Harbor seals are relatively small pinnipeds compared to sea lions and elephant seals. Males are slightly larger than females. Both sexes weigh about 90-120 kg but can be as large as 180 kg and 1.2-1.8 m long (Burns 2009). They are covered with short, stiff hair with variable color pattern and two basic color phases. Background color ranges from yellowish (light phase) to black (dark phase), which is then covered with dark spots, and light rings (Burns 2009).

Status and Trends: As shown in Table 3-1, there are 17 stocks of harbor seals that may be encountered by AFSC or IPHC research activities. Five of the stocks reside in U.S. west coast waters (Carretta *et al.* 2023) and may be affected by IPHC activities in those areas. The remaining 12 stocks reside in Alaskan waters (Young *et al.* 2023) and may be affected either by AFSC or IPHC research activities . None of the harbor seal stocks are listed under the ESA or considered to be depleted under the MMPA.

U.S. West Coast Stocks - A complete count of all harbor seals in the *California stock* is not possible because not all haul out simultaneously. A complete pup count is also not possible because harbor seal pups enter the water almost immediately after birth (Carretta *et al.* 2023). Population size is estimated by

counting the number of seals ashore during the peak haul-out period (May to July) and by multiplying this count by a correction factor. Based on the most recent harbor seal counts during May-July of 2012 he *California stock* of harbor seals is estimated to number 30,968; the calculated PBR is 1,641 (Carretta *et al.* 2023).

The most recent population estimate for the *OR/WA Coast stock* was 24,732 in 1999. In 1999, the mean count of harbor seals occurring along the Washington coast was 10,430 animals (Jeffries *et al*. 2003; as cited in (Carretta *et al.* 2023), and the mean count of harbor seals occurring along the Oregon coast and in the Columbia River was 5,735 animals (Brown 1997; ODFW, unpublished data; as cited in (Carretta *et al.* 2023). Combining these counts and applying a correction factor of 1.53 results in a population estimate of 24,732 (CV=0.12) for the *OR/WA Coast* stock of harbor seals in 1999 (Jeffries *et al*. 2003; ODFW, unpublished data as cited in Carretta *et al.* (2023). However, because the most recent abundance estimate is >8 years old, there is no current estimate of abundance available for this stock. Because there is no current estimate of minimum abundance, PBR cannot be calculated for this stock (Carretta *et al.* 2023).

Using the same correction factor applied to survey data from 1999, population estimates for the *Washington Northern Inland Waters stock* (11,036 CV=0.15), *Southern Puget Sound stock* (1, 568 CV= 0.15) and *Hood Canal stock* (1,088 CV= 0.15) were determined (Carretta *et al.* 2023). Because these estimates are more than 8 years old, no current information on minimum abundance is available and therefore, PBR cannot be calculated (Carretta *et al.* 2023)

Alaska Stocks - In 2010, NMFS and their co-management partners, the Alaska Native Harbor Seal Commission, identified 12 separate stocks of harbor seals in Alaskan waters based largely on genetic structure; this represented a significant increase in the number of harbor seal stocks from the three stocks (Bering Sea, GOA, Southeast Alaska) previously recognized (Young *et al.* 2023). Table 4-1 shows the survey year, abundance estimate probability of decrease and PBR for each of these 12 stocks.

Table 4-1. Abundance Information for the Twelve Alaskan Harbor Seal Stocks

Stock	Year of Survey	Abundance Estimate	Probability of Decrease	PBR
Clarence Strait	2015	27,659	0.413	746
Dixon/Cape Decision	2015	23,478	0.382	644
Sitka/Chatham Strait	2015	13,289	0.410	356
Lynn Canal/Stephens Passage	2016	13,388	0.730	214
Glacier Bay/Icy Strait	2017	7,455	0.904	120
Cook Inlet/Shelikof Strait	2018	28,411	0.609	807
Prince William Sound	2015	44,756	0.648	1,253
South Kodiak	2017	26,448	0.076	939
North Kodiak	2017	8,677	0.409	228
Bristol Bay	2017	44,781	0.218	1,607
Pribilof Islands	2018	229[1]	N/A	7
Aleutian Islands	2018	5,588	0.932	97

Source: Young *et al.* (2023).
[1]Count of seals on shore; does not include a correction factor for seals in the water

Distribution: The species is widespread in temperate and arctic waters of the northern hemisphere of both the Atlantic and Pacific oceans; it is the most widespread of any pinniped. It occurs year-round in Washington. They occur principally in the near shore zone. Harbor seals use hundreds of sites to rest or haulout along the coast and inland waters, including intertidal sand bars and mudflats in estuaries, intertidal rocks and reefs, sandy, cobble, and rocky beaches, islands, log-booms, docks, and floats in all marine areas of the state. Group sizes typically range from small numbers of animals on some intertidal rocks to several thousand animals found seasonally in coastal estuaries (Burns 2009).

Behavior and Life History: Harbor seals are considered a non-migratory species, breeding and feeding in the same area throughout the year (Burns 2009). They give birth on shore and nurse their single pup for 4 to 5 weeks. After the pups are weaned, they disperse widely in search of food. Pupping seasons vary by geographic region (Jeffries *et al.* 2000). Breeding occurs in the water shortly after the pups are weaned. Common prey include sole, flounder, sculpins, hake, cod, herring, squid, octopus, and, to a lesser degree, salmon (Orr *et al.* 2004). Harbor seals can dive to over 400 m and stay submerged over 20 mins but the average depth is less than 100 m and lasts about 2 mins (Eguchi and Harvey 2005).

4.2.22. Spotted Seal

Description[19]: Spotted seals have a light-colored coat with dark spots. Their heads are round with a narrow snout and small body; their flippers are narrow and short. Pups are born with a white coat that they shed when weaned. Spotted seals grow to an average length of 1.5 m and weigh from about 64 to 113 kg when full grown. Males and females are similar in appearance. Spotted seal pups range from about 7 to 12 kg at birth.

Status and Trends: The Bering stock of spotted seals is not listed as threatened or endangered under the ESA, nor is it designated as depleted under the MMPA. In 2009, NMFS completed a comprehensive

[19] https://www.fisheries.noaa.gov/species/spotted-seal Accessed August 9, 2023.

status review of the species and concluded that listing the stock as threatened or endangered under the ESA was not warranted at that time (Boveng *et al.* 2009).

As described for ringed seals, aerial abundance and distribution surveys of ice seals were conducted by U.S. and Russian researchers in the spring of 2012 and 2013; the surveys were conducted over the entire ice-covered portions of the Bering Sea (Moreland *et al.* 2013). Using a subset of the data collected from U.S. waters during the 2012 survey, Conn *et al.* (2014) calculated an abundance estimate of 461,625 spotted seals (95% CI: 388,732 – 560,348). This is considered to be the best estimate for the entire portion of the Bering stock of spotted seals in U.S. waters (Young *et al.* 2023). Reliable data on trends in population abundance for the Bering stock of spotted seals are not available. PBR for the U.S. portion of the Bering stock of spotted seals is estimated to be 25,394 (Young *et al.* 2023).

Distribution and Habitat Preferences: In U.S. waters, spotted seals from the Bering stock are distributed along the continental shelf of the Bering, Chukchi, and Beaufort seas (Young *et al.* 2023). They are present in the Beaufort Sea from July through late August (Ireland *et al.* 2016); they sometimes haul out on land but also spend extended periods at sea and are rarely seen on the pack ice. During the spring when pupping, breeding, and molting, spotted seals are found along the southern edge of the sea ice in the Okhotsk and Bering seas (Rugh *et al.* 1997). As the ice cover thickens at the onset of winter, spotted seals leave the northern portions of their range and move into the Bering Sea (Lowry *et al*. 1998; Von Duyke *et al*. 2016; as cited in Ireland *et al.* (2016).

Behavior and Life History[20]: Spotted seals consume a varied diet consisting of several species of fish, shrimp, crab, squid, octopus, and a variety of pelagic and hyperbenthic crustaceans (Boveng *et al.* 2009). It has been noted that younger animals mostly consume crustaceans, while older seals mainly eat fish. Spotted seals do not dive very deeply for prey; they feed almost exclusively over the continental shelf in waters less than 200 m deep. Their main predators are killer whales and polar bears.

Spotted seals reach sexual maturity at 5 years of age. Pups are born between January and April. Unlike ringed seals, spotted seals give birth on top of stable ice floes rather than in subnivean lairs. The pup, mother, and her mate remain in close proximity until the pup is weaned around 4 to 6 weeks after birth. Pups born on the sea ice rarely enter the water until they have been weaned and undergone a molt. During the first few weeks after weaning, pups remain at least partially dependent on ice while they become proficient at diving and foraging for themselves. The maximum lifespan of a spotted seal is about 30 to 35 years.

4.2.23. Ribbon Seal

Description[21]: The ribbon seals is named for the distinctive adult coat pattern of light-colored bands or "ribbons" on a dark background that they develop as adults. This coat is most distinctive in adult males, while the coloration of adult females is generally silvery-gray with paler ribbons. Ribbon seal pups are born with a thick, wooly white coat (lanugo) that is molted after 3 to 5 weeks.

[20] https://www.fisheries.noaa.gov/species/spotted-seal Accessed August 9, 2023.
[21] https://www.fisheries.noaa.gov/species/ribbon-seal Accessed August 9, 2023.

Ribbon seals are medium-sized when compared to the other ice seal species. They are larger than ringed seals, smaller than bearded seals, and similar in size to spotted seals. At birth, ribbon seal pups are ~ 1m long and weigh ~10 kg. Adults are ~1.5 to 2 m long and weigh ~90 to 150 kg.

Status and Trends: This stock is defined as the *Histriophoca fasciata* species. Stock assessments only consider the portion of the stock found within U.S. waters, because the relevant data on abundance and human-caused M/SI are generally not available for the broader range of the stock or for waters adjacent to the U.S. EEZ (Young *et al.* 2023).

Ribbon seals are not designated as depleted under the MMPA or listed as threatened or endangered under the ESA. NMFS completed a comprehensive status review of ribbon seals under the ESA in 2013 (Boveng *et al.* 2013) and concluded that listing ribbon seals was not warranted at that time.

As described for the other ice seals, in the spring of 2012 and 2013 U.S. and Russian researchers conducted aerial abundance and distribution surveys over the entire ice-covered portions of the Bering Sea and Sea of Okhotsk (Moreland *et al.* 2013). Conn *et al.* (2014) used a sub-sample of this data collected from the U.S. portion of the Bering Sea in 2012 to calculate an abundance estimate of 184,697 ribbon seals (95% CI: 139,617-240,225) in those waters. Although this is a preliminary abundance estimate, it is also the best available and it is a reasonable estimate for the entire portion of the stock in U.S. waters because relatively few ribbon seals are expected north of the Bering Strait during the surveys (Young *et al.* 2023). PBR for the U.S portion of the stock is 9,785 seals. Reliable data on trends in population abundance for the ribbon seal stock or for the portion of the stock within U.S. waters are not available (Young *et al.* 2023).

Distribution and Habitat Preferences: In Alaska waters, ribbon seals range from the North Pacific Ocean and Bering Sea into the Chukchi and western Beaufort seas (Young *et al.* 2023). They are very rarely observed on shorefast ice or land. From late March to early May, ribbon seals populate the Bering Sea ice front (Burns 1970, 1981; Braham *et al*. 1984; as cited in (Young *et al.* 2023), where they are most abundant. As the ice recedes from May to mid-July, the ribbon seals move farther north in the Bering Sea, and haul out on the receding ice edge and remnant ice (Burns 1970, 1981; Burns *et al*. 1981; as cited in (Young *et al.* 2023). As the ice melts, seals become more concentrated, with at least part of the Bering Sea population moving to the Bering Strait and the southern part of the Chukchi Sea.

Ribbon seals spend most of their time in the open ocean and form loose aggregations on pack ice during spring to give birth, nurse pups, and molt. As such, they are sensitive to changes in the environment that affect the timing and extent of sea ice formation and breakup. The main concern about the conservation status of ribbon seals is long-term habitat loss and modification resulting from climate change (Boveng *et al.* 2013).

Behavior and Life History[22]: Except when giving birth, nursing or molting, ribbon seals are relatively solitary animals. They tend to be unwary of their surroundings while hauled out, which suggests they might not have been exposed to the same level of predation from polar bears and foxes as other ice seals. Ribbon seals eat a variety of fishes, cephalopods, and crustaceans; however, information about their feeding habits is limited and mostly restricted to the spring when they typically feed less.

[22] https://www.fisheries.noaa.gov/species/ribbon-seal Accessed August 9, 2023.

5. TYPE OF INCIDENTAL TAKE AUTHORIZATION REQUESTED

AFSC is petitioning NMFS for regulations pursuant to Section 101(a) (5) (A) of the MMPA, 16 USC § 1371.101 (a) (5), and 50 Code of Federal Regulations (CFR) §216, Subpart I, effective October 8, 2024 through October 8, 2029 to allow the potential incidental taking of small numbers of marine mammals incidental to the research activities. The types of incidental taking requested in this application include:

- Mortality or serious injury (M/SI). NMFS interprets the regulatory definition of serious injury (*i.e.*, any injury that will likely result in mortality) as any injury that is "more likely than not" to result in mortality, or any injury that presents a greater than 50% chance of death to a marine mammal (NMFS 2022b, 2023). Thus, a serious injury is classified as leading to the death or likely death of the animal;
- Level A takes if a marine mammal is captured or entangled (*i.e.*, in research gear) although the animal is released alive, with a potential non-lethal injury (also referred to as non-serious injury); or
- Level B takes due to physical disturbance from the presence of research vessels, gear or humans.

AFSC is not requesting takes due to:

- Level A take associated with auditory injury or permanent threshold shift (PTS). PPT is not possible from acoustic gear used for research; or
- Level B harassment (*i.e.*, behavioral disturbance or temporary threshold shift [TTS]) associated with acoustic equipment. The types of equipment used in research would not be used in a manner that would exceed NMFS regulatory hearing thresholds (see Section 6.3).

AFSC surveys use gear such as trawl nets, longlines or gill nets that have the potential to take marine mammals through M/SI or non-lethal (*i.e.*, non-serious) Level A (see Table 1-2). Lethal or non-lethal incidental takes of marine mammals are possible during the use of the following gear: beam, Eastern otter, commercial or Nephrops bottom trawl nets; Cantrawl or Nordic 264 surface trawl nets; commercial, Aleutian wing, Methot or anchovy mid-water trawl nets; or gillnets. These gear types are used during or in conjunction with certain AFSC or IPHC studies (see Table 1-2). Marine mammals can also become hooked or entangled during the use of longline gear, which has the potential to result in lethal or non-lethal M/SI takes.

Level B harassment of pinnipeds hauled out may also occur, as a result of visual disturbance from vessels conducting AFSC research. Many of AFSC's surveys also use active acoustic devices; however, acoustic equipment is not used in a manner that would exceed NMFS' regulatory thresholds for acoustic harassment (*i.e.*, equipment is used at frequencies above 200 kHz, which is above marine mammal hearing thresholds [180 kHz] as described in Section 6). Section 6.4.1 defines and enumerates the requested takes due to injury (including both non-serious and serious) or mortality.

6. TAKE ESTIMATES FOR MARINE MAMMALS

Authorization for incidental takes is requested for activities described in Section 2. To determine the potential for interaction during AFSC and IPHC research activities, a variety of factors are considered including the anticipated changes to research planned for the period 2024 – 2029, a summary of historical interactions between marine mammals and AFSC and IPHC research (specifically the period since 2019), historical marine mammal interactions between commercial fisheries that may use the same gear (as listed in the 2023 List of Fisheries [LOF][23]), and other biological factors such as feeding behavior, distribution or propensity to travel in groups. AFSC anticipates that for the future period 2024 – 2029, 13 trawl surveys (including surface, mid-water and bottom trawl) as well as approximately 30 longline sets (Deep Water Groundfish Surveys and the Barotrauma and Tagging of Deep Water Rockfish) will be discontinued (see Section 1.3). Table 6-1 summarizes the changes in research (either an increase or decrease) in the number of trawls (including surface, mid-water or bottom trawl) or longline surveys. AFSC expects a minor increase of approximately 8 longline sets due to the potential IPHC Catch Protection Survey in the GOARA (20 longline sets) and the increase of about 15 longline sets during the GOA/EBS/Aleutian Islands Longline surveys. The estimated changes in Table 6-1 are not intended to be prescriptive, rather the information is intended to provide the expected changes in level of effort relative to previous research years 2019–2024. This section also describes the rational for discounting Level B harassment due to acoustic sources used by AFSC (see Section 6.3). Finally, potential takes associated with non-auditory Level B harassment due to the physical presence of researchers or vessels is described in Section 6.2.

[23] https://www.fisheries.noaa.gov/national/marine-mammal-protection/list-fisheries-summary-tables#table-1%C2%A0category-i; Accessed October 20, 2023.

Table 6-1. Anticipated Changes to AFSC research Planned 2024 – 2029 that May Encounter Marine Mammals

Survey Name	Difference between Existing and Proposed Research Planned 2024-2029
BSAIRA	
Total Discontinued Trawls in BSAIRA (see list in Section 2.1)	
IPHC FISS Longline	No change
Eastern Bering Sea Groundfish Bottom Trawl	DAS reduced to 75 DAS from 130. No change in number of trawls
BSAIRA Fishing Technology Studies to Reduce Bycatch and Habitat Effects of Fishing	Bottom trawl using commercial gear reduced from 14 to 7 DAS. No change to total number of trawls
Eastern Bering Sea Ichthyoplankton Survey Spring	50 bottom trawls and 50 mid-water trawls eliminated
Northern Bering Sea Ecosystem Surface Trawl Survey	***50 tows using beam trawl added***
Northern Bering Sea Effects of Trawling Study	***New study - 100 Poly Nor'Eastern tows***
Northern Bering Sea Bottom Trawl Survey	***New study - 144 Poly Nor'Eastern tows***
Northern Bering Sea Integrated Ecosystem Research Survey	***New study - 75 surface trawls using a Nordic 264, 75 beam trawls, 35 midwater trawls using an anchovy trawl or equivalent***
Arctic Ecosystem Distributed Biological Observatory	***50 beam trawl tows added***
GOARA	
IPHC FISS Longline	No change
Aleutian Islands Bottom Trawl Survey	***No. of trawls using Poly Nor'Eastern increased to 550 from 420***
Gulf of Alaska Shelf and Slope Groundfish Bottom Trawl	No. of trawls reduced from 820 to 550
Gulf of Alaska Ichthyoplankton Survey Spring	No. of trawls reduced from 250 to 150
Kodiak Age-0/1 Pacific Cod Nursery Habitat	***New study - 64 beam trawls***
GOA/EBS/Aleutian Islands Longline Surveys	***Increased from 75 to 90 stations***
IPHC Catch Protection Survey	***20 sets added***
Washington and Oregon	
IPHC FISS Longline	No change
Estimated Net Change in Trawls	**Net Decrease of ~650 trawls[1] compared to Status Quo**
Estimated Net Change in Longline	**Net Increase of ~8 longline sets compared to Status Quo**

[1]Includes 980 trawls from discontinued studies.

6.1. Mortality or Serious Injury (M/SI) Due to Research

Marine mammals can suffer injury or mortality due to research vessel strikes or encounters with research gear such as trawl nets or longlines that could result in entanglement or capture. No collisions with large whales have been reported from any AFSC fisheries research activities (NMFS 2019d, AFSC 2020, 2021a, 2022a). Transit speeds during research surveys vary from 6-14 kts but average 10 kts. During active sampling with towed gear, vessel speed is typically 2-4 kts. A review of global records of ship strikes with marine mammals was summarized in (Schoeman et al. 2020). While smaller marine mammals may be at risk of collision with vessels under certain circumstances, most publications on the topic discuss collisions between large whales and large vessels. Vanderlaan and Taggart (2007) reviewed historical records of vessel collisions and North Atlantic right whales, reporting a decline in vessel speed from 15 to 8.6 kts reduced the chances of a lethal injury from ~80 to ~20%, respectively. Below 11.8 kts, the chances of lethal injury drop below 50% (Vanderlaan and Taggart 2007).

AFSC and IPHC mitigation to avoid collisions with marine mammals follow current NMFS practices summarized in NMFS (2021b) and include measures such as reduced vessel speeds, avoiding groups of marine mammals, or following deep-water routes (see Section 11 for mitigation measures). Due to slower speeds and required mitigation measures to watch for marine mammals while towing gear, the risk of ship strikes and of ship strikes resulting in injury or mortality is essentially discountable. Takes of marine mammals due to ship strike are not requested and are not discussed further. The following subsections discuss historical encounters with AFSC research gear and discusses the types of research gear used by AFSC that could potentially injure or result in mortality of marine mammals.

6.1.1. Historical Level A and M/SI Takes During AFSC and IPHC Research

As summarized in the 2019 final rule (NMFS 2019d), from 1999-2019 there have been ten takes of marine mammals during AFSC and IPHC research. Six takes occurred during bottom longline efforts which involved harbor seals (2), a Dall's porpoise (1), and Steller sea lions (4). In 2011, two Dall's porpoises were taken occurred during surface trawls (Cantrawl). One take of a northern fur seal occurred in 2009 during the Gulf of Alaska Biennial Shelf and Slope Bottom Trawl (using the Poly Nor'Eastern), a survey which will be reduced from 820 stations to 550 stations beginning in 2024. In 2014, one take of a harbor seal occurred during the ADF&G Large Mesh Trawl Survey which will be discontinued in 2024.

Table 6-2 compares the total number of takes authorized over the 5-year period (2019 – 2024; NMFS (2019d)) to the actual number of M/SI and non-serious Level A takes that have occurred during AFSC and IPHC research between October 2019 and October 2023. As of October 2023, a total of five takes have been reported during AFSC and IPHC longline surveys since 2019. Two takes were classified as non-serious injury Level A because the whales (one sperm and one humpback whale) were released alive and swam away. Two unidentified pinnipeds were killed (2019 and 2021) and one killer whale was killed in 2023. No takes have occurred during trawl surveys between 2019 and October 2023. The total M/SI and non-serious Level A takes reported since 2019 are fewer than what was authorized in the 2019 rule, with the exception of one humpback whale take for which take was not authorized. Additional details on the take events between 2019 and October 2023 are provided in Section 6.1.4.

Table 6-3 presents marine mammal observation data during the AFSC trawl surveys and IPHC longline surveys for the period 2019 – 2022 based on AFSC's annual reports (AFSC 2020, 2021a, 2022a). The

majority of marine mammal observations were recorded during AFSC trawl surveys (n= 328 - 350 marine mammals observed). The 2021 trawl surveys reported the highest number of marine mammal observations (n=184) while only 17-30 marine mammals were observed during trawl surveys in 2022. A total of 184 marine mammals were observed during IPHC longline surveys between 2019 and 2022, with the highest number (n=91) reported in 2022. The number of trawl tows and longline sets is presented by year at the top of Table 6-3. Based on the data summarized in Table 6-3, it does not appear the number of tows or sets is indicative of the number of marine mammals observed. For example, while 91 marine mammals were observed during longline surveys in 2022, there were only 811 sets that year, which was the least number of sets for the 4-year period. As noted in the footnotes to Table 6-3, mitigation measures applied by AFSC and IPHC staff during the period 2019-2022 included visual monitoring for marine mammals, altering vessel course or speed to avoid animals, or the move on rule (*i.e.*, canceling or not starting a set and moving to a different location). These actions and other standard mitigation measures were successful in avoiding take of the marine mammals listed in Table 6-3.

Table 6-2. Comparison of Authorized Takes 2019-2024 to Reported Marine Mammal M/SI or Non-Serious Level A takes 2019 through October 2023

Species	2019 - 2024 Authorized 5-year Takes[a]				Annual Recorded Takes[b]					5-Year Authorized Total All Gears	2019-2023[b] Actual Reported Total All Gears
	AFSC		IPHC	AFSC							
	Trawl	Longline	Longline	Gillnet	2019	2020	2021	2022	2023[b]		
Sperm Whale (North Pacific Stock)	-	1	1	-	-	-	1[c]	-	-	2	1
Humpback Whale	-	-	-	-	-	-	1[c]	-	-	0	1
Beluga Whale											
Beaufort Sea Stock	1	-	-	-	-	-	-	-	-	1	
Eastern Chukchi Stock	1	-	-	-	-	-	-	-	-	1	0
Bottlenose Dolphin CA/OR/WA Offshore Stock	-	-	1	-	-	-	-	-	-	1	0
Common Dolphin	-	-	1	-	-	-	-	-	-	1	0
Pacific White-Sided Dolphin	5	-	-	1	-	-	-	-	-	6	0
Risso's Dolphin	-	-	1	-	-	-	-	-	-	1	0
Killer Whale (Alaska resident)	-	1	1	-	-	-	-	-	1[d]	2	1
Short-finned Pilot Whale	-	-	1	-	-	-	-	-	-	1	0
Harbor Porpoise											
SE Alaska Stock	-	-	-	-	-	-	-	-	-	1[e]	0
GOA Stock	1	-	-	1	-	-	-	-	-	2	1
Bering Sea Stock	1	-	-	-	-	-	-	-	-	1	0
Dall's Porpoise	10	2	-	1	-	-	-	-	-	14[e]	0
Northern Fur Seal											
Eastern Pacific Stock	10	2	1	1	-	-	-	-	-	13-18	0
California Stock	1	1	5	1	-	-	-	-	-	3-8	0
California Sea Lion	-	-	1	-	-	-	-	-	-	1	0
Steller Sea Lion											
Eastern DPS	5	8[f]		1	-	-	-	-	-		1
Western DPS	10			1	-	-	-	-	1	25[f]	1
Bearded Seal	2	-	-	-	-	-	-	-	-	2	0

Species	2019 - 2024 Authorized 5-year Takes[a]				Annual Recorded Takes[b]					5-Year Authorized Total All Gears	2019-2023[b] Actual Reported Total All Gears
	AFSC		IPHC	AFSC							
	Trawl	Longline	Longline	Gillnet	2019	2020	2021	2022	2023[b]		
Harbor Seal	12	-	5	2	-	-	-	-	-	19	0
Spotted Seal	2	-	1	-	-	-	-	-	-	3	0
Ringed Seal	2	1	1	-	-	-	-	-	-	4	0
Ribbon Seal	2	-	-	-	-	-	-	-	-	2	0
Northern Elephant Seal	1	-	-	-	-	-	-	-	-	1	0
Unidentified pinniped	3	2	1	-	1[g]	-	1[g]	-	-	6	2
Unidentified small cetacean	2	-	-	1	-	-	-	-	-	3	0

Key: A "–" symbol indicates zero.

[a] Source: NMFS (2019d)

[b] Source: AFSC (2020, 2021a, 2022a); Protected Species Incidental Take (PSIT) Database Accessed September 2023. Reported takes for 2023 are based on records through October 2023, the date of preparation of this document.

[c] Released alive; non-serious Level A take based on (NMFS 2023). The sperm whale take occurred during the AFSC GOA/EBS/AI Longline Stock Assessment Survey. The humpback whale take occurred during the IPHC Independent Setline Survey near Ketchikan.

[d] Take occurred in the Bering Sea during the AFSC GOA/EBS/AI Longline Stock Assessment Survey.

[e] For harbor porpoise in southeast Alaska, one total take by M/SI is authorized over the 5-year period for trawl and gillnet gears combined. A maximum of one take by M/SI is authorized over the 5-year period for the CA/OR/WA stock of Dall's porpoise (NMFS 2019d).

[f] Total authorized taking by M/SI for northern fur seal over the 5-year period (21) includes stock-specific limits of a maximum authorized take of 18 individuals from the eastern Pacific stock or of 8 individuals from the California stock. Total authorized taking by M/SI for Steller sea lion over the 5-year period (25) includes stock-specific limits of a maximum authorized take of 12 individuals from the eastern stock or of 18 individuals from the western stock (NMFS 2019d).

[g] Take occurred during the AFSC GOA/EBS/AI Longline Stock Assessment Survey.

Table 6-3. Annual Marine Mammal Observations Not Resulting in Take During AFSC Trawl and IPHC Longline Research 2019-2022

Species	2019[a]		2020[a]		2021[a]		2022[a]		4-Year Total Observations by Species and Gear Type	
	Trawl	Longline	Trawl	Longline	Trawl	Longline	Trawl	Longline	Trawl	Longline
Total Tows or Sets	**1,335**	**1,705**	**181**	**2,042**	**181**	**2,042**	**952**	**811**	**2,649**	**6,600**
Sperm Whale (North Pacific Stock)	-	2		10[e]	-	18	-	23	-	**43**
Humpback Whale	1[b]	3	1	2	23[f]	1	3-10	9	**28-38**	**15**
Sei/Fin Whale	2-8[b]	-	2	-	-	-	-	-	**4-10**	-
Fin Whale	50[c]	-	5[b]	-	29[d]	1	1	1	**85**	**2**
Gray Whale	-	-	-	-	55[d]	-	-	-	**55**	-
Beluga Whale (Stock not specified)	-	-	-	-	-	-	-	-	-	-
Bottlenose Dolphin (CA/OR/WA Offshore)	-	-	-	-	-	-	-	-	-	-
Common Dolphin	-	-	-	-	-	-	-	-	-	-
Pacific White-Sided Dolphin	-	-	-	-	5	-	-	-	**5**	-
Risso's Dolphin	-	-	-	-	-	-	-	-	-	-
Killer Whale (Alaska resident)	1	10	8[d]	14	28[d]	-	>5[d,g]	55[h]	**>42[d]**	**79**
Short-finned Pilot Whale	-	-	-	-	-	-	-	-	-	-
Harbor Porpoise (Stock not specified)	-	-	-	-	-	-	-	-	-	-
Dall's Porpoise	21[b]	-	20	-	31	18	8-14	-	**80-86**	**31**
Northern Fur Seal (Stock not specified)	-	-	-	-	2	-	-	2	**2**	**2**
California Sea Lion	-	10	-	-	-	-	-	1	-	**11**
Steller Sea Lion (DPS not specified)	-	-	-	-	10[b]	1	-	1	**10**	-
Bearded Seal	-	-	-	-	-	-	-	-	-	-
Harbor Seal	-	-	-	-	-	1	-	-	-	**1**
Spotted Seal	-	-	-	-	-	-	-	-	-	-

Species	2019[a]		2020[a]		2021[a]		2022[a]		4-Year Total Observations by Species and Gear Type	
	Trawl	Longline	Trawl	Longline	Trawl	Longline	Trawl	Longline	Trawl	Longline
Total Tows or Sets	**1,335**	**1,705**	**181**	**2,042**	**181**	**2,042**	**952**	**811**	**2,649**	**6,600**
Ringed Seal	-	-	-	-	-	-	-	-	-	-
Ribbon Seal	-	-	-	-	-	-	-	-	-	-
Northern Elephant Seal	-	-	-	-	-	-	-	-	-	-
Unidentified pinniped	1	-	-	-	-	-	-	-	**1**	-
Unidentified cetacean	14[b]	-	1	-	1	-	-	-	**16**	-
4-Year Total Observations by Gear Type	**90-96**	**25**	**37**	**26**	**184**	**40**	**>17-30**	**91**	**328-350**	**184**

[a] Source: AFSC (2020, 2021a, 2022a); None of the observations noted in the table resulted in take under the MMPA or ESA.
[b] Move on rule implemented.
[c] Move on rule implemented during one out of eleven observations.
[d] Vessel altered course to avoid interaction.
[e] Move on rule implemented during one out of nine observations.
[f] Move on rule implemented during one out of six observations.
[g] Three encounters total; one encounter with two whales a second encounter with three whales and the third encounter described as “several” whales.
[h] During the 2021 IPHC longline survey, there were 18 encounters with killer whales. During each encounter, significant depredation was noted, including some sets described as “ineffective” due to the significant amount of depredation.

6.1.2. Bottom, Mid-water, and Surface Trawls

Capture or entanglement in research trawl gear may occur whenever marine mammals are swimming near the gear, either intentionally while foraging or unintentionally while migrating. Any animal captured in a net is at risk of drowning unless it can be quickly freed. Animals can also be captured or entangled in netting or tow lines. Lines wrapped around the animal or its fins can immobilize or injure it by cutting into or through blubber, muscles and bone or by constricting blood flow or severing appendages. Immobilization can cause immediate drowning or internal injuries. The animal's ability to feed may also be affected by gear entanglement (Andersen *et al.* 2008). Interaction that does not result in the immediate death of the animal by drowning can also cause serious injury (*i.e.*, >50% chance of resulting in mortality) or non-serious injury (*i.e.*, Level A harassment).

Beginning in 2024, of the 26 surveys that will be discontinued, 14 surveys use trawl gear (see Section 1.3). In addition, five trawl surveys will have a reduced level of effort. For example, beginning in 2024, the Gulf of Alaska Shelf and Slope Groundfish Bottom Trawl Survey will be reduced from 820 to 550 stations, the Gulf of Alaska Ichthyoplankton Survey will be reduced from 250 to 150 tows. In the Eastern Bering Sea Groundfish Bottom Trawl Survey DAS will be reduced from 130 to 75 but total number of tows remains the same at 376. Conversely, only one survey, the Aleutian Islands Bottom Trawl Survey, will increase in effort from 420 to 550 tows. Five new studies are planned using bottom, mid-water or surface trawl as described in Section 1.3 and Tables 1-1 and 1-2. Overall, AFSC anticipates fewer trawls for the future five-year period compared to what was planned for 2019-2024.

As noted in the 2019 final rule (NMFS 2019d), AFSC has had two historical interactions with marine mammals and bottom trawling; one with a northern fur seal in 2009 and the second with a harbor seal in 2014. The survey during which the bottom trawl gear encountered a harbor seal will be discontinued.

As shown in Table 1-2, many AFSC studies employ mid-water or surface trawls. Similar to bottom trawls, marine mammals can be caught or entangled in mid-water or surface trawl lines and nets. Table 1-2 provides details on the gear, timing and location of these surveys. Since 2003, only two takes have occurred during surface trawls, both involving Dall's porpoise (NMFS 2019d). For the most recent reporting period, 2019 – October 2023, no takes with any type of trawl surveys have occurred.

As shown in Table 6-3, Fin whales were encountered during the Acoustic-Trawl survey at least 85 times as a significant observation. A significant observation is recorded when the whales are within the minimum approach distance while transiting, conducting a transect, or when gear is being deployed or retrieved. Although no direct interactions, encounters causing serious injury or mortality with Fin whales has not occurred in any AFSC research survey, in 2019, Freed et al. 2023, reported that a Fin whale was entangled and killed in the Alaska Pollock Fishery's trawl gear. Despite the history of the AFSC research activities having no interactions with Fin whales, we request one take for trawl gear due to the potential for a direct interaction causing serious injury or mortality.

In 2023, nine killer whales were entangled in commercial bottom trawl gear from the Bering Sea/Aleutian Island flatfish fishery. Six of these killer whales were found to be killed by the fishing gear. Previous reports of killer whales entangled in trawl gear are reported in Freed et al, 2023. Despite no history of interactions of AFSC research activities using trawl with killer whales, the increase in entanglements in

commercial gear may be a sign of a behavior change in the killer whale population. In an abundance of caution, the AFSC would like to request one killer whale take for trawl gear.

As evident in Table 6-3, some marine mammal species have been observed during trawl surveys, including: humpback whales; sei or fin whales; gray whales; killer whales; Dall's porpoises; northern fur seals; Steller sea lions; and unidentified pinnipeds or cetaceans.

To be precautionary and because there is still a risk of marine mammal interactions with any type of trawl gear, Level A harassment or M/SI takes of marine mammals by trawl gear (not differentiated between bottom, midwater or surface trawls) are being requested in this application (see Section 6.4.1).

6.1.3. Longlines and Hook and Line Surveys

Longlines are strings of baited hooks that are either anchored to the bottom (to target groundfish) or are free-floating (to target pelagic species). Marine mammals may be hooked or entangled in longline gear resulting in interactions that could cause death due to drowning, strangulation, severing of carotid arteries or the esophagus, infection, an inability to evade predators, or starvation due to an inability to catch prey (Hofmeyr *et al.* 2002). Bottom longlines pose less of a threat to marine mammals due to their deployment on the ocean bottom but can still result in entanglement in buoy lines or hooking.

Hook and line is a general term fishing methods that employ short fishing lines with hooks. This gear is similar to methods commonly used by recreational fishers using bait or lures in various ways to attract target species. This type of gear has less potential for marine mammal interaction but the use of baited hooks in the presence of marine mammals carries some risk. However, the scale of hook and line operations in relation to longline operations and the lack of extended, unattended soak times mean that use of other hook and line gear is much less likely to result in marine mammal interactions (81 FR 38516). The 2023 LOF categorizes the Alaska commercial sablefish longline fishery as Category II, characterized as having "occasional" interaction with sperm whales, Steller sea lions (both DPS) and northern elephant seals[24].

For the most recent reporting period 2019 through October 2023, the AFSC and IPHC encounters with marine mammals that resulted in mortality, serious injury or non-serious injury occurred during longline surveys, namely AFSC's sablefish longline survey in GOA/EBS/AI and IPHC's setline survey in GOA. Table 6-2 summarizes takes associated with longline surveys since 2019, while Table 6-3 presents a summary of the observations of marine mammals during longline surveys that did not result in M/SI or non-serious Level A take. Details on the gear, timing, duration, and locations of AFSC and IPHC longline surveys are provided in Tables 1-1 and 1-2.

Since 2019, there have been four documented mortalities including one Steller sea lion (2023), two unidentified pinnipeds (2019 and 2021) and one killer whale (2023). Based on the observations documented in the 2019 annual report (AFSC 2020), the pinniped mortality was most likely a sea lion which had apparently been hooked in the lower jaw. The animal was observed during gear retrieval and floated away and presumably sunk. No sightings of sea lions during setting or gear retrieval or any other time during the survey at GOA sampling stations (AFSC 2020). Based on the 2021 annual report (AFSC

[24] https://www.fisheries.noaa.gov/national/marine-mammal-protection/list-fisheries-summary-tables#table-1%C2%A0category-i; Accessed October 20, 2023.

2021a), an unidentified pinniped was documented during the AFSC longline survey near Yakutat Bay (58.683 N, 140.713 W). The animal was most likely a sea lion and was observed lifeless and presumed dead. No protected species were observed during the retrieval of the first set (AFSC 2021a).

In 2023, a Steller sea lion came up on skate 72 (out of 90) on the first haul of the longline gear at around 12:15am around depth 500 m. The animal appeared to be caught on the hook of the gear and hauled roughly half out of the water before it fell off the hook when it hit the roller. The animal appeared lifeless and promptly sank. The incident was observed and the observer was able to identify the animal as a female Steller sea lion based on its light-colored fur, robust body, and distinctive snout. The observer was unable to take photos of the animal, nor was able to record exact latitude and longitude.

Since 2019, AFSC and IPHC researchers have recorded two non-lethal and one lethal encounter with cetaceans. Depredation by whales, in particular killer whales and sperm whales, occurs frequently during AFSC and IPHC longline surveys. As an example of this behavior, while no takes occurred during any AFSC or IPHC surveys in 2020, depredation occurred frequently during longline surveys. Based on information in the 2020 annual report (AFSC 2021a), killer whales depredated on the longline at 17 stations; ten in the Bering Sea and seven in the GOA. Sperm whales were observed depredating on the longline at 20 stations in the GOA. In general, depredating whales stayed at least 0.25 nm away from the survey vessel and depredation occurred deep within the water column out of sight. Mitigation procedures were followed when depredation was suspected and the longline was hauled back as quickly as possible when whales were observed. There were no observations of adverse whale interactions throughout the entire survey. An unidentified sea lion was taken on the longline in the Gulf of Alaska. The incident occurred at Station 523, southeast of Kodiak Island (AFSC 2020). Similar depredation events are documented in annual reports between 2019 and 2022. Considering depredation is likely to continue during future AFSC and IPHC surveys, M/SI and non-serious Level A takes are requested for certain species, as shown in Table 6-4.

In July 2021, a vessel conducting the AFSC's Alaska Longline Survey had a direct interaction (entanglement) with a sperm whale (AFSC 2022b). The interaction resulted in a live release; the whale swam away with no visible gear wrapped around it and is assumed to have survived with no major effects. The whale was observed resting and breathing at the surface for a brief time after which it dove and was not observed further. The entire encounter lasted approximately 10 minutes. The preliminary determination was that the encounter can be considered a non-serious injury because the animal self-released and all gear (hooks and line) was accounted for after the event. The onboard crew reported the entanglement to the NMFS 24-hr Alaska Marine Mammal Stranding Network Hotline and Alaska Regional Office OPR Staff.

A post-incident review determined that mitigation measures during the study were sufficient but that the work was occurring in an area commonly used by sperm whales. It was determined that this might not be a random occurrence during these longline surveys and it is likely that entanglement of a sperm whale could happen again. Recommendations for future work in this area commonly used by sperm whales were to convert the sampling gear to pots and to participate in Southeast Alaska Sperm Whale Avoidance Project (SEASWAP) to improve fleet communication efforts to help avoid sperm whales.

The post-incident review concluded that: "This occurrence of an entanglement of one sperm whale does not alter the conclusions in Section 8.6 of the 2019 Biological Opinion for AFSC and IPHC Fisheries and

Ecosystem Research that stressors resulting from research activities would not be expected to appreciably reduce the likelihood of the survival and recovery of sperm whales in the wild by reducing the reproduction, numbers, or distribution of that species" (NMFS 2019a). The report also concluded that the event was not random and is likely to happen again in the future.

On August 4, 2021, a vessel conducting the IPHC 2021 FISS survey in Ernest Sound, Southeast Alaska, had a significant interaction (entanglement) with a humpback whale. As shown in Figure 6-1, the encounter resulted in a live release, but the whale swam away with line wrapped near its dorsal fin (AFSC 2021b).

Figure 6-1. Humpback Whale Post Entanglement

Source: AFSC (2021b)

Visibility at the time of the interaction was 3.2 km and wave heights were about 2 m. There was no sign of whale activity in the morning while setting, but visibility at that time was poor. Once the crew realized that an animal had been entangled, they carefully hauled back the gear until it was about 25 m from the boat; at that time the entangled animal was identified as a humpback whale, and the crew noted that line was wrapped twice around the dorsal fin and once around the head and mouth area. The crew was unable to untangle or cut the wrapped gear from the whale. As it struggled to stay afloat and breathe. Eventually the whale snapped the gear and swam away, still entangled. During the event the IPHC Setline Coordinator was informed and attempts were made to reach the Alaska Marine Mammal Stranding Network. NOAA staff were contacted and instructed the crew to stop trying to free the whale of the remaining gear; hoping the whale would be able to free itself, or if observed to be still entangled, an entanglement team could be sent out later. An analysis of effects summarized in AFSC (2021b) concluded that mitigation measures

followed during the survey were sufficient and no additional measures would have avoided the entanglement or improved the response.

The research took place in an area where humpback whales are common but the post-incident analysis concluded that the entanglement was a random occurrence and not likely to be repeated during the FISS. The post-incident report did not attempt to determine the DPS of the encountered whale. However, as based on an analysis of the occurrence of ESA-listed humpbacks off Alaska presented in NMFS (2021a), only 2% of humpback whales found in Southeast Alaska waters are likely to be from the threatened Mexico DPS; the remaining 98% are from the non-listed Hawaii DPS.

In 2023, the AFSC longline survey documented a dead killer whale with its tail wrapped in the groundline during retrieval on June 7th. The event took place in the Bering Sea (56.4616, -171.5883). The animal became entangled while apparently depredating the groundline. The groundline was cut as the crew could not safely unwrap the dead whale, and the remainder of fishing gear was hauled from the opposite end. With the whale detached from the groundline, the vessel finished hauling from the other end, however, a portion of the end of this line was collected for a possible tissue sample and genetic identification of the whale. The chief scientist, acting as the protected species observer (PSO), and the vessel captain were on watch for marine mammals while setting gear. There were no whales present. While hauling gear, approximately 25 orcas (likely two pods) were observed surrounding the vessel, and depredation was evident. The survey has been experiencing heavy depredation at previous stations by what appears to be two pods of killer whales following the vessel (Pers. Comm., AFSC staff June 7, 2023; Protected Species Incidental Take [PSIT] Database entry at 15:30 on June 7, 2023).

In June 2023, a killer whale was entangled and killed in longline gear during the AFSC Alaska Longline survey. On skate 59 of the first set, the line tightened and hauling slowed, such as when fishing on a sticky bottom or in a strong current. On skate 60, an orca whale surfaced at the hauling station with its tail wrapped 2 – 3 times in the ground line. Hauling was immediately halted and the whale remained attached to the groundline on the side of the vessel. There was no movement by the whale. While the whale was attached to the line at the hauling station, staff onboard the vessel informed their AFSC superiors and contacted the NMFS 24-hr Alaska Marine Mammal Stranding Network Hotline and AKRO Office of Protected Resources staff (Sadie Wright). Since there was no movement by the whale, it was determined by all parties that it was deceased. The whale exceeded the weight limit of the vessel's crane and therefore could not be lifted onto the vessel and towing it to port was unrealistic given the distance to the nearest port (60 nm to St. Paul). Collecting tissue samples from the whale while in the water would not have been safe given the distance to the whale below the hauling station. Professional judgment between the chief scientist and vessel operator determined that the best course of action would be to cut the line due to the deceased nature and difficulty of disentangling the whale from the line.

Once the line was cut, the whale, and the line wrapped around its tail, sunk out of site. The vessel immediately steamed to the opposite end of the groundline, which was attached to a surface line and buoy, and hauled the remainder of the gear in the opposite direction. All hooks and groundline were successfully retrieved (full census of hooks) in this manner and the whale was not seen again as it had apparently become disentangled from the gear. A small piece of groundline from where the line apparently was wrapped on the whale's tail was set aside as a potential tissue sample source. While

retrieving from the opposite end of the set, signs of depredation continued and orca whales were observed.

It appears from data collected on a temperature depth recorder (TDR) attached to the goundline on an adjacent skate that the whale became entangled while the gear was on the seafloor, and subsequently drowned. An approximate time stamp of entanglement is available from the TDR that was attached to the gear about 25 meters from the entanglement location, suggesting that the whale encountered the line (at a depth of ~450 m) while it was on the bottom and before retrieval had begun. The whale likely died close to 8:00 AM, when the sensor appears to reach a depth of 150 m before returning to the bottom. The whale was not seen attached to the groundline until 11:25, when it brought to the surface during retrieval.

6.1.4. Gillnets and Tangle Nets

Gillnets have vertical panels of netting buoyed with floats at the top and weighted at the bottom. Fish are caught by the gills in the netting. Tangle nets are similar to gillnets but are considered to be more selective and less lethal to fish than gillnets because of smaller mesh sizes that allow fish to be caught by nose or jaw which allow fish to be resuscitated (81 FR 38516). As described for purse seines, animals can be caught in the gillnet itself or entangled in the net or lines associated with the net.

Gillnets are only used by the AFSC for the Little Port Walter Research Station and Experimental Hatchery (50 sets) and the Bristol Bay Red King Crab Settlement Survey (48 stations), both of which are deployed by small boats close to shore. Additional details on the gear, timing, duration, and locations of these surveys are provided in Table 1-1.

Commercial drift gillnet salmon fisheries in Bristol Bay and GOA are considered to be Category II, defined as having a risk of M/SI greater than 1% but less than 50% of the species' PBR (NOAA 2021). The AFSC does not use commercial drift gillnets in its fisheries research program (NMFS 2019d). However, marine mammal interactions with gillnets are well documented (Reeves et al., 2013; Lewison et al., 2014; Zollett, 2009; as cited in 81 FR 38516). Considering the documented risk to marine mammals due to gillnets, AFSC is requesting a small number of non-serious (non-lethal) Level A and M/SI takes for gillnet surveys as described in Section 6.4.1.

6.1.5. All Other Gear Types

As shown in Table 1-1, AFSC uses a variety of trap nets and pots to conduct research. However, there is not a reasonable potential for non-serious Level A injury or M/SI of marine mammals due to these gear types used by the AFSC (NMFS 2019d). Therefore, these gears are not considered further in this application. All other gears used in AFSC fisheries research (*e.g.*, a variety of water sampling devices, transducers, hydrophones, towed cameras, plankton nets [including Methot trawls], conductivity, temperature, and depth [CTD] sampling tools, remotely operated vehicles [ROVs], UxS, SCUBA, etc.) do not have the potential for marine mammal interactions and are also not considered further.

6.2. Physical Disturbance Due to Research

There are numerous pinniped haulouts throughout GOARA and BSAIRA where animals hauled out or in the water nearby may be disturbed by the physical presence of vessels, gear or humans in the vicinity. As described in the 2019 final rule (NMFS 2019d), Physical disturbance would result in no greater than

Level B harassment. Behavioral responses may be considered according to a scale based on the method developed by Mortenson (1996 as cited in NMFS [2019d]) including: 1) Alert – changing position, brief movement of head, and craning head or neck; 2) Movement – moving away from the source or retreating over the beach; and 3) Flight – all movement (flushes) into the water. NMFS considers responses corresponding to Levels 2–3 to constitute Level B harassment (NMFS 2019d).

Level B harassment of pinnipeds was estimated in the 2019 final rule based on the proximity of rookery and haulout locations to research survey stations and track lines. Analysis was limited to activities that occurred within a 5-km buffer zone from the shoreline. A 2-km zone around point data represented the extent of the vessel and survey activity around the point. For track lines such as the Alaska longline survey and the GOA acoustic trawl survey, a 0.9 km buffer around the line represented the potential interaction area. Take interactions where then tallied if the buffered line or point data from the research activities intersected within a 0.5 nm buffer zone around any identified rookery or haul-out. Level B disturbance was assumed to occur based on the number of animals expected to be present within the buffer zones close to survey locations. The number of animals was estimated based on count data for Steller sea lions and based on a density value multiplied by the buffered haulout area for harbor seals.

AFSC does not believe that any research activities will result in physical disturbance of pinnipeds other than Steller sea lions (Western DPS only) or harbor seals. Level B take estimates are likely overestimates because research may occur infrequently or be of short duration.

Table 6-4. Total Requested Level B Takes by Physical Disturbance 2024-2029

Species	Stock	Estimated Annual Level B Disturbance Takes[1]
Harbor seals	Clarence Strait	28
	Dixon/Cape Decision	30
	Sitka/Chatham Strait	864
	Lynn Canal/Stephens Passage	45
	Glacier Bay/Icy Strait	20
	Cook Inlet/Shelikof Strait	2,554
	Prince William Sound	3,063
	South Kodiak	3,761
	North Kodiak	885
	Bristol Bay	132
	Pribilof Islands	28
	Aleutian Islands	290
Steller sea lion	Western DPS (GOARA)	3,082
	Western DPS (BSAIRA)	112

[1]Based on approach described here and in the 2019 final rule (NMFS 2019d).

6.3. Echosounders and Sonar

The impacts of anthropogenic sound on marine mammals have been summarized in numerous, books, articles and reports including: Richardson *et al.* (1995), National Research Council (NRC) (2005), Southall *et al.* (2007) and Southall *et al.* (2019). The distance to which anthropogenic sounds are audible

depends on the level of ambient sound, anthropogenic sound source levels, frequency, ambient sound levels, the propagation characteristics of the environment, and sensitivity of the marine mammal (Richardson *et al.* 1995). Animals exposed to natural or anthropogenic sound may experience physical and behavioral effects, ranging in magnitude from none to severe (Southall *et al.* 2007).

Marine mammals exposed to high intensity sound repeatedly or for prolonged periods could experience hearing threshold shift, resulting in the loss of hearing sensitivity at certain frequency ranges (Kastak *et al.* 1999, Schlundt *et al.* 2000, Finneran *et al.* 2002, Finneran *et al.* 2005). Threshold shift results in PTS, where loss of hearing sensitivity is unrecoverable, or TTS, in which case an animal may recover hearing sensitivity over time (Southall *et al.* 2007).

In April 2020, NMFS published interim recommendations (Guan 2020) for sound sources such as multi-beam echosounders and sonar equipment used in geophysical surveys which are similar to those used by AFSC. For example, AFSC researchers use acoustic equipment with various frequency ranges including some as low as 1.5 kHz. The EK60 commonly used in AFSC research operates at frequencies of 38, 70, 120 and 200 kHz, and the EK80 ranges from 10-500 kHz. While these frequencies are in the range of cetaceans, phocids and otariids shown in Table 6-5, given the highly directional and narrow beam widths of this equipment, NMFS does not anticipate animals would be exposed to underwater sound levels resulting in injury, and the potential for Level B exposures is also reduced.

Based on information in Crocker and Fratantonio (2016), NMFS developed a user tool to estimate the distances potentially ensonified by echosounders. Assuming a source level of 226 decibels (dB) referenced at 1 microPascal at 1 meter (dB re 1 µPa at 1 m), frequency of 18 kHz beam width of 7°, and water depth of 200 m, underwater sound from an EK60 echosounder exceeding the behavioral threshold limit of 160 dB would only extend approximately 12 m from the source. The distance remains about the same for all EK60 frequencies and would be even less for the higher frequency emitted by the EK80. Considering the mitigation measures to observe for and avoid marine mammals within close proximity to research vessels during research activities, the potential sound levels and effects of this type of equipment on marine mammals are considered *de minimis* and no Level B takes due to acoustic harassment are requested.

Table 6-5. Generalized Hearing Ranges for Marine Mammal Hearing Groups in Water

Hearing Group	Hearing Range
Low-frequency cetaceans (*e.g.*, baleen whales)	7 Hz to 35kHz
Mid-frequency cetaceans (*e.g.*, killer whales)	150 Hz to 160 kHz
High-frequency cetaceans (*e.g.*, dolphins)	275 Hz to 160 kHz
Phocids (*e.g.*, seals)	50 Hz to 86 kHz
Otariids and other non-phocid marine carnivores (*e.g.*, sea lions)	60 Hz to 39 kHz

Source: NMFS (2018).

6.4. Take Request

AFSC's take request is based on historical marine mammal interactions with commercial fisheries as summarized in the 2023 LOF report[25], AFSC and IPHC annual reports, as well as a consideration as to whether certain species that have no history of interactions may be vulnerable to capture in trawl or longline gear because they are similar to species that have a history of encounters with gear (see Section 6.4.1).

6.4.1. Mortality or Serious Injury Takes

6.4.1.1. TRAWL GEAR

As shown in Table 6-3, while observations of marine mammals have been documented during AFSC trawl surveys, the implementation of mitigation measures including but not limited to visual monitoring, the move on rule and vessel speed or course alterations, have been successful in avoiding interactions with marine mammals observed. Therefore, takes requested are based more heavily on records of M/SI or non-serious Level A harassment than observations alone.

In consideration of historical interactions with commercial fisheries and AFSC surveys, as well as species-specific vulnerability, takes associated with trawl gear for the 5-year period 2024-2029 are presented in Table 6-6. While some species do not have a history of interactions with trawl gear, to be precautionary, M/SI and non-serious Level A takes are requested because they may occur in similar areas or exhibit similar behaviors as species for which encounters have been documented. For example, Pacific white-sided dolphins may have similar vulnerability to capture in trawl gear as Dall's porpoises given similar habitat preferences to areas where research trawls are planned. Harbor porpoises are also considered vulnerable to capture in trawl gear, but likely with less frequency of interaction given their inshore and coastal distribution. Additionally, Steller sea lions may be vulnerable to encounters with trawl gear similar to northern fur seals given their preferred habitat preferences. Takes for all seal species are requested to be precautionary considering the potential for a few individuals to be encountered during AFSC trawl surveys. While historically there has been only one harbor seal take during the ADF&G Large Mesh Trawl Survey which will be discontinued, takes for harbor seals reflect the potential overlap between trawl areas and the distribution of the species in GOARA.

6.4.1.2. LONGLINE OR HOOK AND LINE GEAR

Interactions with marine mammals during the use of longline have been documented since 2019, as shown in Table 6-1. In three cases, mortality was evident (two unidentified pinnipeds and one killer whale) while two interactions occurred that did not result in mortality or serious injury because the whales (one sperm and one humpback whale) were released alive and swam away freely (see Section 6.1.3). Based on the historical interactions with commercial fisheries, AFSC and IPHC research and considering the potential overlap in research areas with marine mammals that may become entangled in longlines or hook and line gear, AFSC and IPHC request takes for potential M/SI as well as non-serious Level A harassment for the period 2024-2029, as shown in Table 6-6. For many species, given the lack of

[25] https://www.fisheries.noaa.gov/national/marine-mammal-protection/list-fisheries-summary-tables#table-1%C2%A0category-i; Accessed October 20, 2023.

historical takes due to AFSC and IPHC research, the level of requested M/SI and non-lethal (non-serious) Level A harassment takes are an overestimate.

Table 6-6. M/SI and Non-Serious Injury (Non-Lethal Level A) Takes Requested Due to Gear Interaction[1]

Species	2024 - 2029 Requested 5-year Takes for M/SI and Non-Serious Level A				5-Year Authorized Total All Gears
	AFSC		IPHC	AFSC	
	Trawl	Longline	Longline	Gillnet	
Sperm Whale ENP stock	-	1	1	-	2
Humpback Whale	-	1	1	-	2
Fin Whale	1	-	-	-	1
Beluga Whale Beaufort Sea Stock Eastern Chukchi Stock	 1 1	 - -	 - -	 - -	 1 1
Bottlenose Dolphin CA/OR/WA Offshore Stock	-	-	1	-	1
Common Dolphin CA/OR/WA stock	-	-	1	-	1
Pacific White-Sided Dolphin North Pacific Stock	5	-	-	1	6
Risso's Dolphin CA/OR/WA Stock	-	-	1	-	1
Killer Whale Alaska resident	1	1	1	-	3
Short-finned Pilot Whale CA/OR/WA Stock	-	-	1	-	1
Harbor Porpoise SE Alaska Stock GOA Stock Bering Sea Stock	1[a] 1 1	- - -	- - -	1[a] 1 -	1 2 1
Dall's Porpoise Alaska Stock CA/WA/OR stock	10	3[b]	-	1	14
Northern Fur Seal Eastern Pacific Stock California Stock	 10 1	 2[c] 1[c]	 1[c] 5[c]	 1 1	 13-18 3-8
California Sea Lion	-	-	1	-	1
Steller Sea Lion Eastern DPS Western DPS	5 10	8[d]		1 1	25
Bearded Seal Beringia DPS	2	-	-	-	2
Harbor Seal Three West Coast and all Alaska Stocks	12	-	5[d]	2	19

Species	2024 - 2029 Requested 5-year Takes for M/SI and Non-Serious Level A				5-Year Authorized Total All Gears
	AFSC		IPHC	AFSC	
	Trawl	Longline	Longline	Gillnet	
Spotted Seal Bering Alaska	2	-	1	-	3
Ringed Seal Arctic Subspecies	2	1	1	-	4
Ribbon Seal U.S. Stock	2	-	-	-	2
Northern Elephant Seal California Breeding Stock	1	-	-	-	1
Unidentified pinniped	3	2	1	-	6
Unidentified small cetacean	2	-	-	1	3

[a] One take by M/SI is authorized over the 5-year period for trawl and gillnet gears combined.
[b] Maximum of one take by M/SI is authorized over the 5-year period for the CA/OR/WA stock of Dall's porpoise.
[c] Stock-specific limits of a maximum authorized take of 18 individuals from the eastern Pacific stock or 8 individuals from the California stock. Total authorized M/SI take over the 5-year period (25) includes a maximum of 12 sea lions from the eastern stock or 18 from the western stock.
[d] Five takes incidental to longline gear over the 5-year period with no more than one take expected for any given stock over the 5-year period. Therefore, total authorized M/SI take for all stocks is 19 which includes stock-specific limits of a maximum of one take over 5 years for three U.S. west coast stocks; a maximum of three takes over 5 years for the Prince William Sound and Sitka/Chatham Strait stocks; and a maximum of two takes over 5 years from each of the remaining Alaska stocks.

6.5. Total Takes Requested

Table 6-7 summarizes the total non-lethal injury (*i.e.*, non-serious injury Level A), M/SI and physical disturbance takes requested over the 5-year period 2024-2029.

Table 6-7. Total Takes Requested 2024 to 2029

Common Name	5-Year Total Level A (Non-Lethal) or M/SI Takes	5-year Total Physical Disturbance Takes
Cetaceans		
Sperm Whale ENP stock	2	
Humpback Whale	2	
Fin Whale	1	
Beluga Whale Beaufort Sea Stock Eastern Chukchi Stock	 1 1	-
Bottlenose Dolphin CA/OR/WA Offshore Stock	1	-
Common Dolphin CA/OR/WA stock	1	-
Pacific White-Sided Dolphin North Pacific Stock	6	-

Common Name	5-Year Total Level A (Non-Lethal) or M/SI Takes	5-year Total Physical Disturbance Takes
Risso's Dolphin CA/OR/WA Stock	1	-
Killer Whale Alaska Resident	3	-
Short-finned Pilot Whale CA/OR/WA Stock	1	-
Harbor Porpoise SE Alaska Stock GOA Stock Bering Sea Stock	1 2 1	-
Dall's Porpoise Alaska Stock CA/WA/OR stock	1 13	-
Pinnipeds		
Northern Fur Seal Eastern Pacific Stock California Stock	13-18 3-8	-
California Sea Lion	1	-
Steller Sea Lion Eastern DPS Western DPS	7-12 18	3,194 (Western DPS only)
Bearded Seal Beringia DPS	2	-
Harbor Seal Three West Coast and all Alaska Stocks	19	11,700
Spotted Seal Bering Alaska	3	-
Ringed Seal Arctic Subspecies	4	-
Ribbon Seal U.S. Stock	2	-
Northern Elephant Seal California Breeding Stock	1	-
Unidentified pinniped	6	-
Unidentified small cetacean	3	-

7. ANTICIPATED IMPACT OF THE ACTIVITY ON SPECIES AND STOCKS

Only takes for non-lethal Level A injury, M/SI and Level B physical disturbance of marine mammals are being requested in this application. The MMPA and its implementing regulations have not provided a clear operational definition of "take by harassment" especially for minor, temporary behavioral disturbance such as the physical disturbance discussed herein. There is general recognition that minor and brief changes in behavior generally do not have biologically significant consequences for marine mammals and do not "rise to the level of taking" (NRC 2005). Therefore, only Level A non-lethal injury or M/SI takes are considered in assessing anticipated impacts to species and stocks (Table 7-1). As shown in Table 7-1, in all cases the percentage of Level A non-lethal injury or M/SI takes is less than 0.5% of stock abundance and for most species, is 0.01% or less.

Table 7-1. Mortality and Serious Injury Take Requests Relative to Potential Biological Removal

Common Name	Total Annual Level A (Non-Lethal) or M/SI Takes[1]	PBR[2]	Abundance[3]	Total Annual Level A (Non-Lethal) or M/SI as Percentage (%) of Abundance[4]
Cetaceans				
Sperm Whale ENP Stock	2	Unknown	Unknown	Unknown
Humpback Whale[5] Hawaii DPS	2	127	11,278	0.02
Fin Whale	1	5.1	3,168	<0.01
Beluga Whale Beaufort Sea Stock Eastern Chukchi Stock	1 1	Unknown 178	39,258 13,305	<0.01 <0.01
Common Bottlenose Dolphin CA/OR/WA Offshore Stock	1	19.7	3,477	0.03
Common Dolphin CA/OR/WA Stock	1	8,889	1,256,308	<0.01
Pacific White-Sided Dolphin North Pacific Stock	6	Unknown	26,800	0.02
Risso's Dolphin CA/OR/WA Stock	1	46	6,336	0.02
Killer Whale Alaska Resident	3	19	1,920	0.10
Short-finned Pilot Whale CA/OR/WA Stock	1	4.5	836	0.12
Pinnipeds				
Northern Fur Seal Eastern Pacific Stock California Stock	13-18 3-8	11,40 451	626,618 14,050	<0.01 0.06

Common Name	Total Annual Level A (Non-Lethal) or M/SI Takes[1]	PBR[2]	Abundance[3]	Total Annual Level A (Non-Lethal) or M/SI as Percentage (%) of Abundance[4]
California Sea Lion	1	14,011	257,606	<0.01
Steller Sea Lion				
Eastern DPS	7-12	2,592	43,201	0.03
Western DPS[6]	18	318	52,932	0.03
Bearded Seal				
Beringia DPS[6]	2	8210	301,830	<0.01
Harbor Seal[7]				
Three U.S. West Coast Stocks	1	Unknown	11,036	Unknown
Clarence Strait Stock	1	746	27,659	<0.01
Dixon/Cape Decision Stock	1	644	23,478	<0.01
Sitka/Chatham Strait Stock	4	356	13,289	0.03
Lynn Canal/Stephens Passage Stock	1	214	13,388	0.01
Glacier Bay/Icy Strait Stock	1	120	7,455	0.01
Cook Inlet Shelikof Strait Stock	1	807	28,411	0.01
Prince William Sound Stock	4	1,253	44,756	0.01
South Kodiak Stock	1	939	26,448	<0.01
North Kodiak Stock	1	228	8,677	0.01
Bristol Bay Stock	1	1,607	44,781	<0.01
Pribilof Islands Stock	1	7	229	0.44
Aleutian Islands Stock	1	97	5,588	0.02
Spotted Seal				
Bering Alaska[6]	3	25,394	461,625	<0.01
Ringed Seal				
Arctic Subspecies[6]	4	4,755	171,418	<0.01
Ribbon Seal				
U.S. Stock[6]	2	9,785	184,697	<0.01
Northern Elephant Seal				
California Breeding Stock	1	5,122	187,386	<0.01
Unidentified pinniped	6	N/A	N/A	N/A
Unidentified small cetacean	3	N/A	N/A	N/A

[1]See Table 6-6.

[2]See Section 4 narratives.

[3]See Table 3-1.

[4]Rounded to nearest 100th of a percent.

[5]As described in Section 6.1.3, only 2% of humpback whales found in Southeast Alaska waters are likely to be from the threatened Mexico DPS; the remaining 98% are from the non-listed Hawaii DPS. Therefore, the abundance for the Hawaii stock is used here.

[6]PBR is calculated for U.S. portion of the DPS.

[7]See Table 6-6, footnote d. For West Coast U.S. stocks, the take could be from either the California, OR/WA Coast, or Washington Inland Waters stock. Abundance is lowest in the Washington Inland Waters stock, so this was used to calculate a worst-case percentage.

8. ANTICIPATED IMPACTS ON SUBSISTENCE USES

The taking of small numbers of marine mammals under Section 101(a)(5) (A) through (D) of the MMPA:

> *may be allowed only if NMFS: (a) Finds, based on the best scientific evidence available, that the total taking by the specified activity during the specified time period will have a negligible impact on species or stock of marine mammal(s) and will not have an unmitigable adverse impact on the availability of those species or stocks of marine mammals intended for subsistence uses…*

Unmitigable adverse impact:

> *means an impact resulting from the specified activity: (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (i) Causing the marine mammals to abandon or avoid hunting areas; (ii) Directly displacing subsistence users; or (iii) Placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.*

This application requests authorization to take marine mammals in the GOARA, BSAIRA, and CSBSRA while conducting AFSC and IPHC research projects. The type of potential takes include non-lethal injury (*i.e.*, non-serious injury Level A), M/SI and physical disturbance. The AFSC is aware of the potential for causing "unmitigable adverse impact" and is committed to implementing actions to avoid or to minimize any such affects to the Alaska Native subsistence community.

The AFSC will implement fisheries research so that there will not be a reduction in the availability of marine mammal species to a level insufficient for harvest to meet subsistence needs due to:

- Actions that may cause marine mammals to abandon or avoid hunting areas – Most AFSC fisheries research activities occur offshore away from land or include mitigation measures to minimize the risk of disturbing pinnipeds hauled out on land. Sporadic and temporary physical disturbance is not likely to result changes in use or abandonment of known haulouts.
- As described in the Communications Plan (Appendix C of this application), AFSC will engage in targeted outreach and community engagement in areas where there is potential for fisheries research to overlap with subsistence hunting and fishing activities. The AFSC will work with subsistence users to identify important areas for marine mammals and subsistence hunters early in the planning process as well as in real time to identify the potential for overlap between migratory pathways, key hunting regions and seasons, and proposed fisheries research. This communication should lead to avoidance of any issues of displacement of marine mammals and their prey.
- Activities that may directly displace subsistence users – AFSC and IPHC fisheries research primarily utilizes ocean going ships generally suited for offshore work. These vessels are not designed to work in or near sea ice where much of the subsistence harvest of pinnipeds occurs. Further, research activities will likely occur outside of periods harvest periods. Research efforts will avoid the paths of seal hunters.

- Bowhead whale hunts may occur near sea ice in the spring or in open water in the fall. AFSC fisheries research is only conducted during the open water season in the Arctic spring. However, AFSC fisheries research vessels may be present in whale hunting areas in the fall. AFSC's Communications Plan (Appendix D) is designed to minimize the risk of any such interference by advance planning and communication between AFSC scientists and subsistence hunting organizations.
- AFSC fisheries research vessels make port calls in established harbors and ports, thus reducing the chances for interaction with the transit of hunters to and from coastal villages to nearby hunting regions. As described in Appendix C (Communications Plan), in those rare cases where a research vessel may need to anchor offshore of a subsistence community, AFSC personnel will, within the limits of maritime safety, direct the ship to a predetermined location in coordination with the local subsistence community so as to avoid interfering with subsistence activities.
- AFSC and IPHC use a variety of towed nets, longlines and other sampling gear to conduct research. Current operational guidelines and mitigation measures (see Section 11) designed to reduce incidental catch of marine mammals include measures that direct activities away from marine mammals near the research vessel or suspend gear deployment; these measures reduce the possibility for placing any barriers between subsistence hunters and marine mammals.

9. ANTICIPATED IMPACTS ON HABITAT

Impacts on habitat due to AFSC research could occur though changes to the benthic environment due to trawling and changes in prey availability to marine mammals. In addition, critical habitat has been designated for two species that may occur in the region as described in Section 9.3.

9.1. Impacts to Benthic Habitat

AFSC conducts bottom trawling in all three research areas, which may result in physical damage to seafloor habitat. Physical damage may include furrowing and smoothing of the seafloor as well as the displacement of rocks and boulders; such damage can increase with multiple contacts in the same area (Chuenpagdee *et al.* 2003). Damage to seafloor habitat may also harm infauna and epifauna (*i.e.*, animals that live in or on the seafloor or on structures on the seafloor. In general, physical damage to the seafloor would likely recover within eighteen months through the action of water currents and natural sedimentation, with the exception of rocks and boulders which may be permanently displaced (Stevenson *et al.* 2004).

Current research actions as described in Section 1.3 (see Table 1- 1) affect about 122 km^2 of benthic habitat (AFSC personal communication August 2023). This is about 0.01% of the available benthic habitat in the three research areas (NMFS 2019c). Under the proposed action ~675 bottom trawls would be added but ~1,350 bottom trawls would be discontinued. Therefore, overall direct impacts on benthic habitat moving forward under the proposed action would be fewer than those currently occurring.

Biological damage would likely recover within the same timeframe, although repeated disturbance of an area can prolong the recovery time (Stevenson *et al.* 2004). Relatively small areas would be impacted by AFSC bottom trawling. However, because research surveys are not conducted are in the exact same locations, they would not result in repeated disturbances in any given area. AFSC activities are not expected to effect water quality. Consequently, the potential for AFSC research to impact the quality of physical habitat sufficiently to affect the survival of marine mammals or availability their prey is considered to be discountable for all species.

9.2. Changes in Food Availability Due to Research Survey Removal of Prey and Discards

Prohibited species caught in AFSC and IPHC research activities that serve as prey species for marine mammals include Pacific herring, capelin, and eulachon. A shown in Table 9-1, over the period 2016-2022, the average annual catch of these species across all three research areas was: 0.08 mt for capelin; 2.14 mt for eulachon; and 3.87 mt for Pacific herring. These research removals are minor considering biomass estimates and commercial and sport allocations, which are accounted for by fisheries managers when quotas are determined, and therefore represent a low magnitude of impact on each species (NMFS 2019c).

As shown in Table 9-2, Pacific salmon, which are also preyed upon by some marine mammal species are caught in AFSC and IPHC research activities. Over the period 2016-2022, 111,000 pacific salmon were caught during research activities across all three regions (personal communication AFSC October 2023). Comparatively the total Alaska commercial harvest of salmon through September 1 of 2023 was ~215

million salmon[26]. Moving forward under the proposed action, the research catch of prohibited species is not expected to increase.

Table 9-1. Mortality and Serious Injury Take Requests Relative to Potential Biological Removal

Species	Total AFSC Research Catch per Year (mt)[1,2]							Average AFSC Research Catch (mt)
	2016	2017	2018	2019	2020	2021	2022	
GOARA								
Eulachon	0.24	0.90	0.38	1.20	3.0	6.75	0.82	1.90
Capelin	0	0.02	0.01	0.30	0.01	0.17	<0.01	0.07
Pacific halibut	0	0	0	11.74	0	11.72	0	3.35
BSAIRA								
Eulachon	<0.01	0	<0.01	0	1.64	0	<0.01	0.24
Capelin	<0.01	0	<0.01	0	<0.01	0	<0.01	<0.01
Pacific halibut	10.01	5.77	8.89	4.83	0	6.90	8.99	6.48
Pacific herring	0	3.23	4.00	5.60	0	4.38	9.90	3.87
CSBSRA								
Capelin	0	0.02	0	<0.01	0	0	0	<0.01

Source: AFSC October 2023

Table 9-2. Mortality and Serious Injury Take Requests Relative to Potential Biological Removal

Region	Total Number Salmonids Caught
BSAIRA	61,149
GOARA	49,851
CSBSRA	37
Oregon and Washington	1
Total	**111,038**

Source: AFSC October 2023

In addition to the small total amount biomass taken, research surveys tend to target smaller size classes of fish than are preferred by marine mammals. Research catches are also distributed over a wide area because of the random sampling design covering large sampling areas. Fish removals by research are therefore highly localized and unlikely to affect the spatial concentrations and availability of prey for any marine mammal species. This is especially true for pinnipeds, which are opportunistic predators that consume a wide assortment of fish and squid. For these reasons it is determined that removal of prey biomass during AFSC and IPHC surveys would not change food availability and would have no effect on overall prey sources for marine mammals.

[26] https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherysalmon.bluesheetsummary, Accessed October 16, 2023

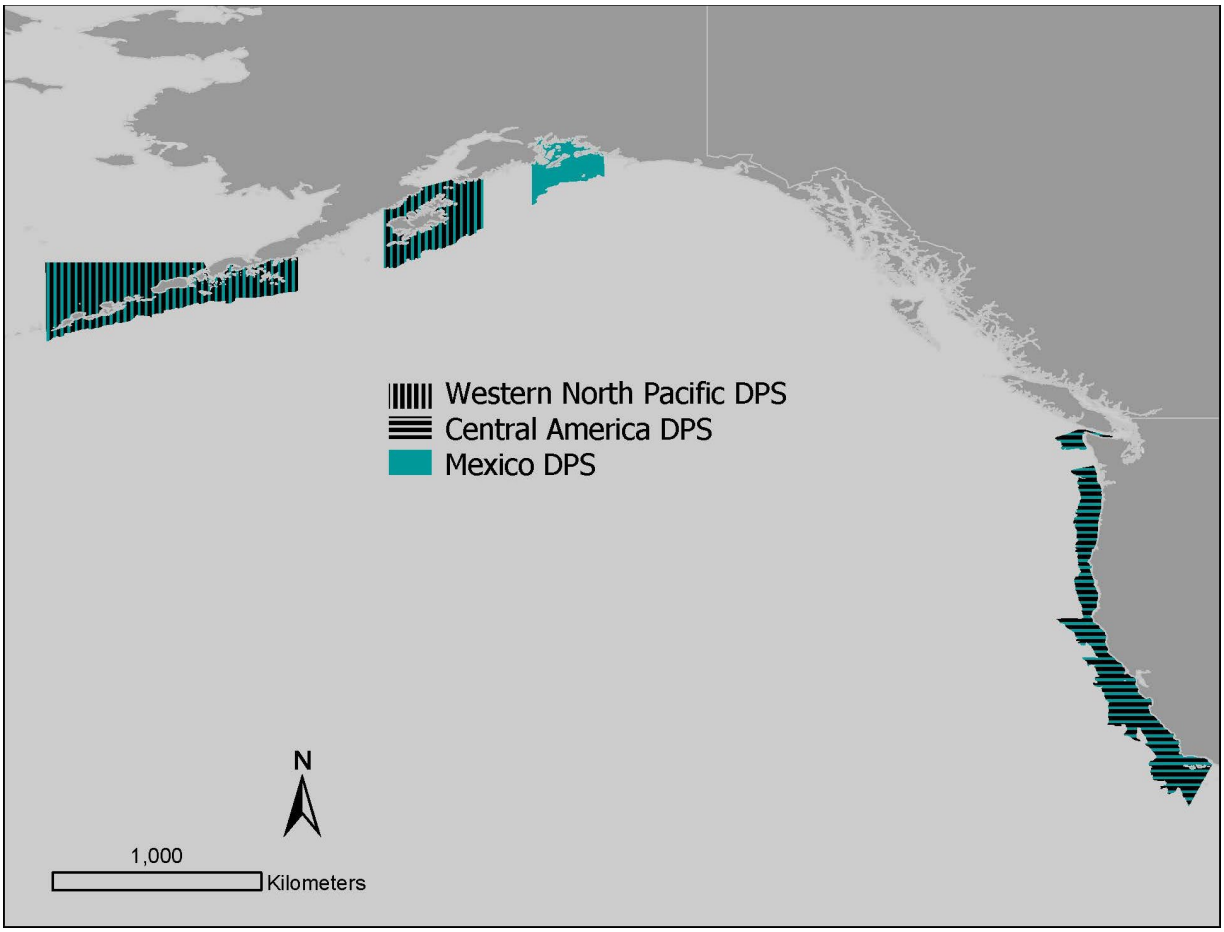
9.3. Critical Habitat that May be Impacted by Research Activities

9.3.1. Humpback Whales

In 2021, NMFS designated (86 FR 21082), then revised (86 FR 41668) critical habitat for three ESA-listed DPSs of humpback whales (86 FR 21082): the endangered Western North Pacific DPS; the threatened Mexico DPS; and the endangered Central America DPS (Figure 9-1). Specific areas designated as critical habitat for the Central America DPS of humpback whales contain approximately 48,521 square nautical miles of marine habitat in the North Pacific Ocean within the portions of the California Current Ecosystem off the coasts of Washington, Oregon, and California. These designated critical habitat areas are within AFSC and IPHC research areas.

The final rule (86 FR 21082) describes access to adequate prey as the only essential physical or biological feature of humpback whale critical habitat. NMFS considered and evaluated various biological and physical features of humpback whale habitat in addition to access to prey such as migratory corridors and soundscape but determined that the best available scientific information does not currently support recognizing any additional essential features.

Figure 9-1. Humpback Whale Critical Habitat



Source: https://www.fisheries.noaa.gov/resource/map/humpback-whale-critical-habitat-maps-and-gis-data Accessed August 10, 2023

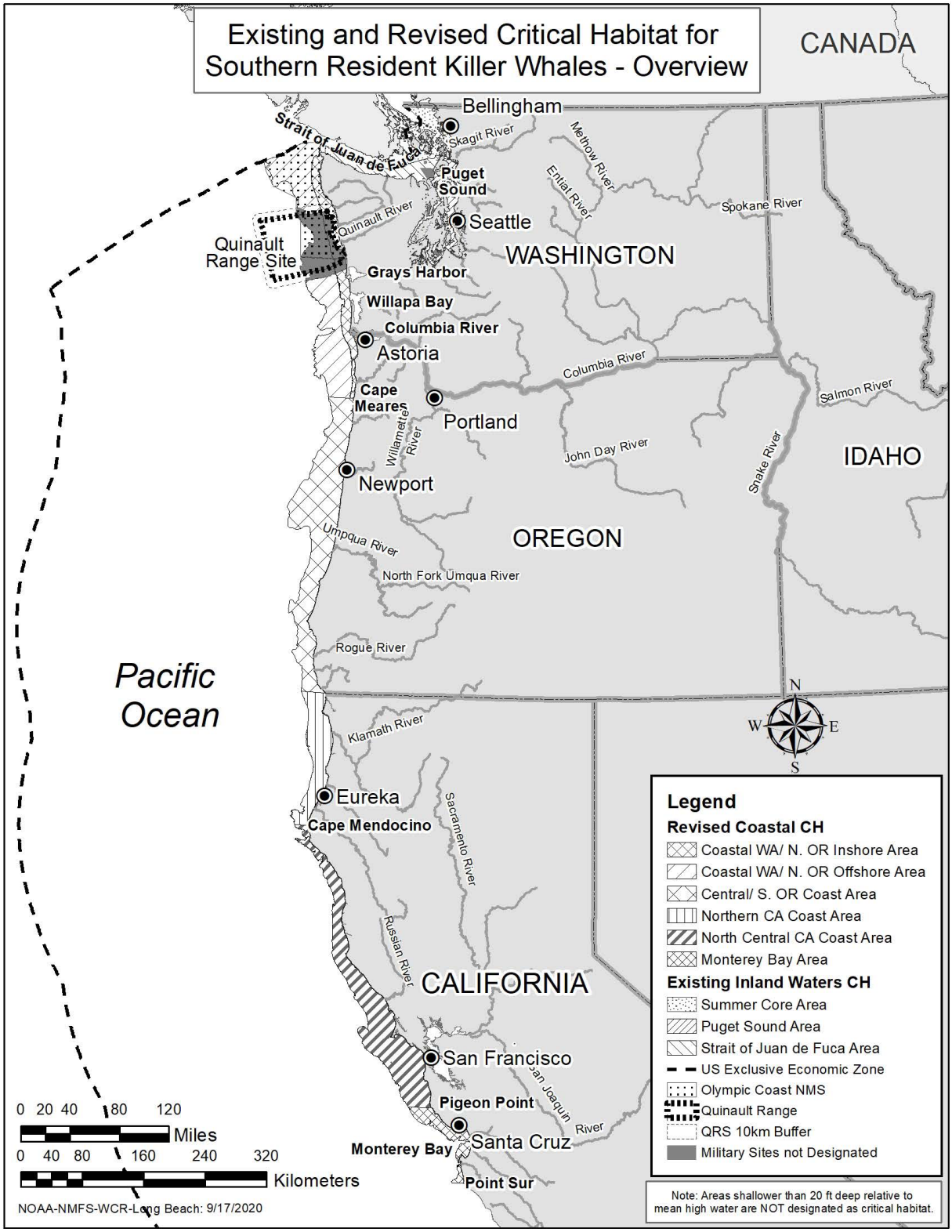
9.3.2. Killer Whales – Southern Resident DPS

On August 2, 2021, NMFS revised critical habitat for the southern resident DPS of killer whales (86 FR 41668). The revision added six additional coastal areas totaling 41,204 km^2 and excluded the Quinault range site from the designation (Figure 9-2). Some IPHC research is potentially conducted near these areas.

The original 2006 final rule designating critical habitat for southern resident killer whales (79 FR 9054) determined that based on the best available scientific information, the following features were essential to the conservation of the species within inland waters of Washington: (1) Water quality to support growth and development; (2) prey species of sufficient quantity, quality and availability to support individual growth, reproduction and development, as well as overall population growth; and (3) passage conditions to allow for migration, resting, and foraging.

The same three biological and physical features were identified in the revised rule (86 FR 41668). As described in the final revised rule, southern resident killer whales' range over a variety of habitats, including inland waters and open ocean coastal areas from the Monterey Bay area in California north to Southeast Alaska. They are highly mobile, and can cover large distances, However, analyses of their movement patterns on the outer coast have revealed preferred depth bands and distances from shore that suggest potential travel corridors, and variations in travel speed or duration of occurrence (86 FR 41668.

Figure 9-2. Revised Critical Habitat for Southern Resident Killer Whales



Source: https://media.fisheries.noaa.gov/2021-07/map-srkw-ch-overview-fedreg-final7.pdf?null=. Accessed August 10, 2023

9.3.3. Beluga Whales – Cook Inlet DPS

On April 11, 2011, NMFS designated two areas covering 7,800 km^2 of the Cook Inlet marine environment as critical habitat for beluga whales (Figure 9-3). Area 1 encompasses the area from the mouth of Three Mile Creek north and east to include waters of the Susitna, Little Susitna, and Chickaloon rivers below the mean higher high water (MHHW) level. High concentrations of beluga whales are often observed in these areas from spring through fall. Drainages in Area 1 support large eulachon and salmon runs, providing important foraging habitat for Cook Inlet beluga whales during ice-free months; Area 1 is used extensively by these whales between April and November (NMFS 2008). Critical Habitat Area 1 also encompasses shallow tidal flats or mudflats that provide beluga additional areas for foraging, calving, molting, and escape from predators.

Critical Habitat Area 2 lies south of Area 1 and encompasses all marine waters of Cook Inlet south of a line connecting Point Possession and the mouth of Three Mile Creek, and north of 60.25°N, including waters within 3.7 km of MHHW along the western shoreline of Cook Inlet between 60.25°N and the mouth of Douglas River; all waters of Kachemak Bay east of 40.00°W; and waters of the Kenai River below the Warren Ames Bridge at Kenai. Area 2 includes nearshore areas along western Cook Inlet and Kachemak Bay, and is known as fall and winter foraging and transit habitat for beluga whales, as well as spring and summer habitat for smaller concentrations of beluga whales. AFSC and IPHC research activities in Cook Inlet may overlap with part of these areas.

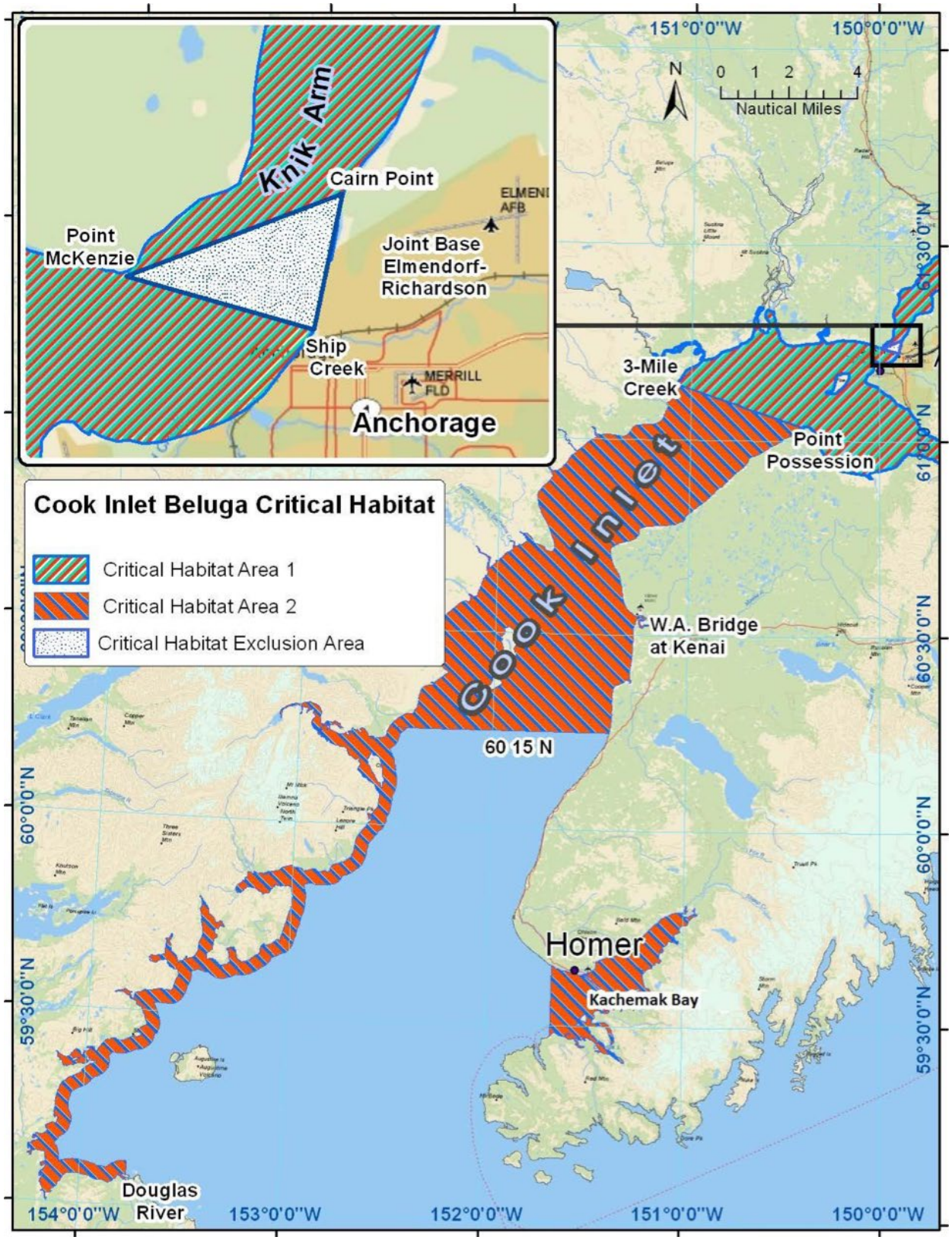
Critical habitat for Cook Inlet beluga whales is defined by certain physical and biological features (PBFs) (NMFS 2011) including:

- PBF #1: Intertidal Waters of Cook Inlet with depths less than 30 feet (ft) mean lower low water (MLLW) (9.1 m) and within 5 miles (8 km) of high and medium flow anadromous fish streams;
- PBF # 2 Primary prey species consisting of four species of Pacific salmon (Chinook, sockeye, chum, and coho), Pacific eulachon, Pacific cod, walleye pollock, saffron cod, and yellowfin sole;
- PBF # 3 Waters free of toxins or other agents of a type and amount harmful to Cook Inlet beluga whales;
- PBF # 4 Unrestricted passage within or between the critical habitat areas; and
- PBF # 5 Waters with in-water sound below levels resulting in the abandonment of critical habitat areas by Cook Inlet beluga whales.

9.3.4. North Pacific Right Whales

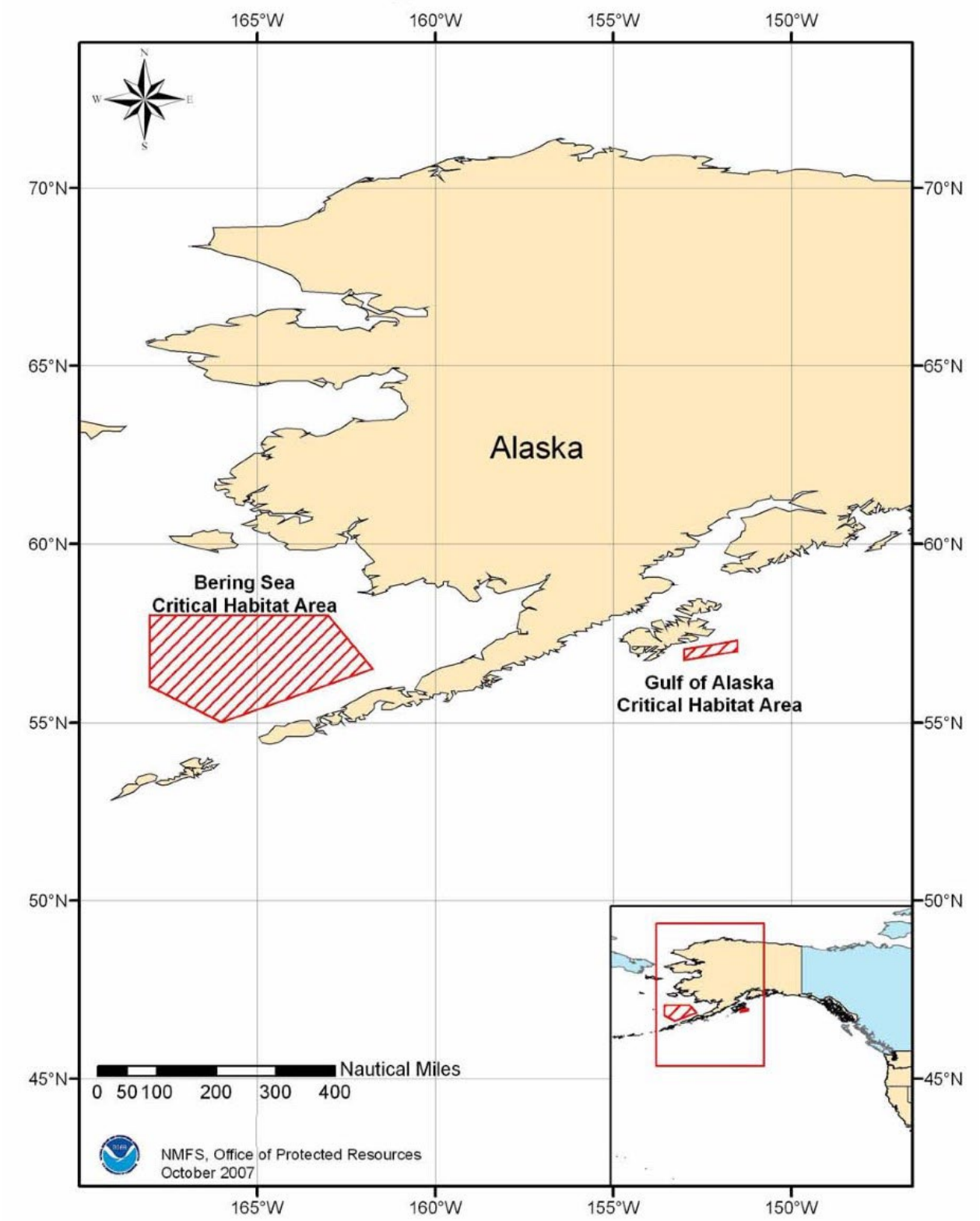
In 2006, NMFS issued a final rule designating two areas in the North Pacific as northern right whale critical habitat; one area is in the GOA south of Kodiak Island and one is located in the Bering Sea (71 FR 38277) (Figure 9-4). In 2008, NMFS re-designated the same two areas as ENP right whale critical habitat under the newly recognized species name, *E. japonica* (73 FR 19000). AFSC and IPHC research overlaps with these areas.

Figure 9-3. Cook Inlet Beluga Whale Critical Habitat



Source: https://media.fisheries.noaa.gov/dam-migration/belugawhale_cookinletch.pdf Accessed June 28, 2023

Figure 9-4. North Pacific Right Whale Critical Habitat

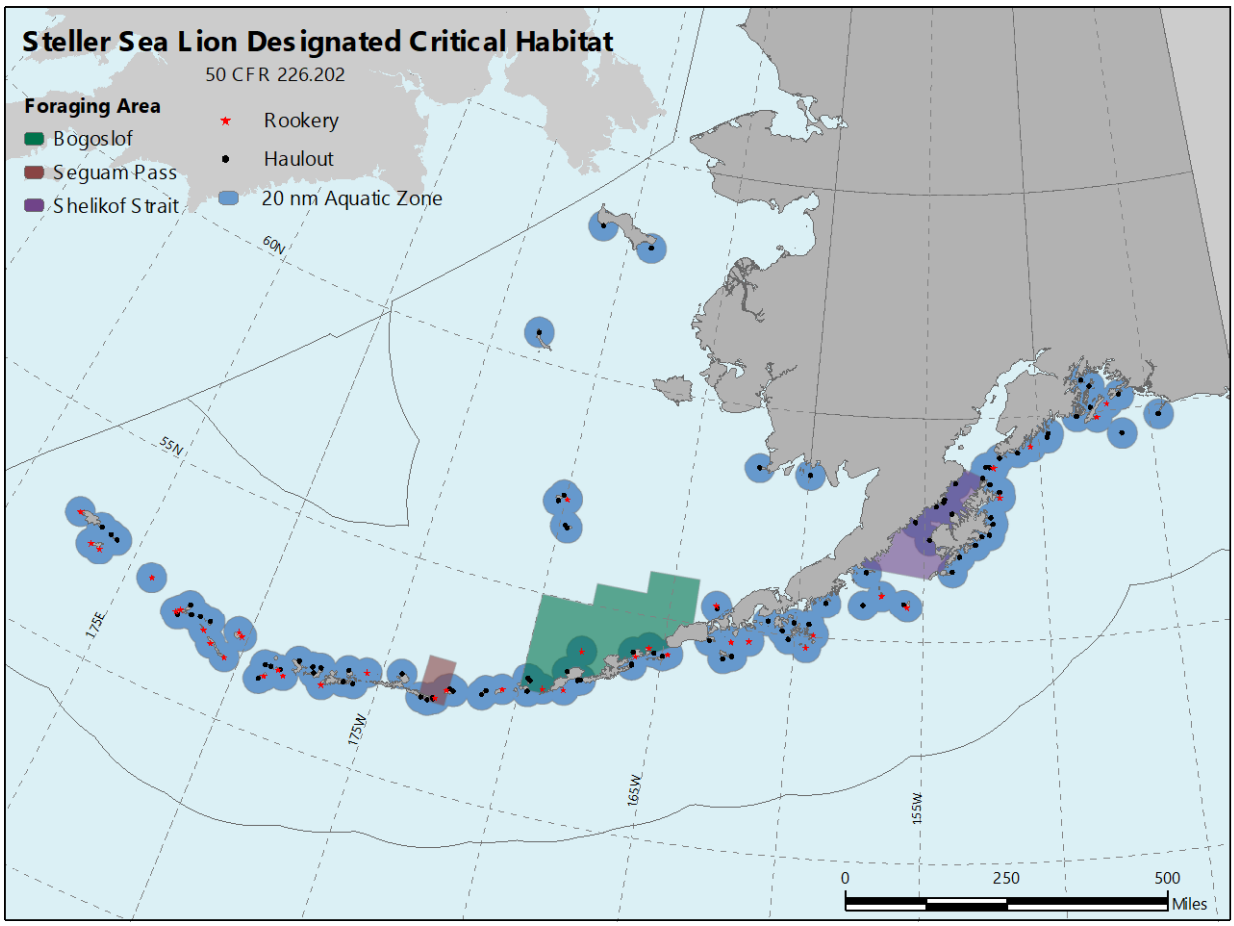


Source: https://media.fisheries.noaa.gov/dam-migration/northpacificrightwhale.pdf Accessed June 28, 2023

9.3.5. Steller Sea Lions

Critical Habitat for Steller sea lions was designated in 1993 (58 FR 45269) Critical habitat includes marine waters within 37 km of rookeries and haulouts within the breeding range of the western DPS and within three special aquatic foraging areas in Alaska (Figure 9-5). IPHC and AFC research activities may occur within or near these areas.

Figure 9-5. Steller Sea Lion Critical Habitat



Source: https://media.fisheries.noaa.gov/dam-migration/steller-sea-lion-critical-habitat-alaska.pdf; Accessed June 29, 2023

9.3.6. Ringed Seals

On April 1, 2022, NMFS designated critical habitat for the Arctic subspecies of ringed seals (87 FR 19232). The critical habitat designation covers areas of marine habitat in the Bering, Chukchi, and Beaufort seas (Figure 9-6), and overlaps with the AFSC research areas.

Five factors were considered in the development of critical habitat for ringed seals: (1) geographical area; (2) physical or biological habitat features; (3) specific areas occupied by the species that contain essential physical and biological features; (4) special management considerations or protection; and (5) adequacy of critical habitat geographical designations to ensure the conservation of the species (87 FR 19232).

Figure 9-6. Ringed Seal Arctic Subspecies Designated critical habitat

Source: https://media.fisheries.noaa.gov/2022-03/arctic-ringed-seal-critical-habitat.pdf Accessed August 10, 2023

PBFs considered in the determination included:

- Snow covered sea ice suitable for subnivean birth lair formation and maintenance—defined as waters 3 m or more in depth containing area of shorefast ice or dense stable pack ice that contain snow drifts at least 54 cm deep to maintain lairs;
- Sea ice suitable for basking and molting—defined as waters 3 m or more in depth with 15% or higher concentrations of sea ice; and
- Primary prey resources to support ringed seals—defined as small, schooling fish and small crustaceans.

The designated critical habitat depicted in Figure 9-6 was identified by NMFS as the specific area that contains all three of these physical and biological essential features. However, since it is unlikely that AFSC would be conducting research in this critical habitat area during the ice-covered season, any effects would be focused on primary prey resources for ringed seals.

9.3.7. Bearded Seals

On April 1, 2022, NMFS designated critical habitat for the Beringia DPS of bearded seals (87 FR 19180). The critical habitat designation covers areas of marine habitat in the Bering, Chukchi, and Beaufort seas (Figure 9-7), and overlaps with the AFSC research areas.

To identify specific areas that may qualify as critical habitat for bearded seals of the Beringia DPS, NMFS considered five factors: (1) geographical area occupied by the species at the time of listing; (2) physical or biological habitat features essential to the conservation of the species; (3) specific areas occupied by the species that contain one or more of the essential physical and biological features; (4) which of the essential features may require special management considerations or protection; and (5) whether a critical habitat designation limited to geographical areas occupied by the species at the time of listing would be inadequate to ensure the conservation of the species (87 FR 19180). PBFs essential to protecting critical habitat considered in the determination included:

- Sea ice habitat suitable for whelping and nursing—defined as waters 200 m or less deep containing at least 25% pack ice;
- Sea ice habitat suitable for molting—defined as waters 200 m deep or less containing at least 15% pack ice; and
- Primary prey resources to support bearded seals—defined as waters 200 m deep or less containing epifaunal and infaunal invertebrates and demersal fish.

These PBFs of bearded seal critical habitat are dynamic with variable locations on both spatial and temporal scales. Bearded seal movements and habitat use are strongly influenced by the seasonality of sea ice; the seals range widely, choosing the most suitable habitat conditions. The identified PBFs can be found in any given year in the designated critical habitat shown in Figure 9-7 (87 FR 19180). However, since it is unlikely that AFSC would be conducting research in this critical habitat area during the ice-covered season, any effects would be focused on primary prey resources for bearded seals.

Figure 9-7. Bearded Seal Beringia DPS Critical Habitat

Source: https://media.fisheries.noaa.gov/2022-03/beringia-dps-bearded-seal-critical-habitat.pdf Accessed August 10, 2023

9.4. Effects on Marine Mammal Habitat and Critical Habitat

The 2019 PEA (NMFS 2019c) and associated BiOp (NMFS 2019a) identified changes in food availability due to removal of prey by research survey gear as the stressor that could result in effects on marine mammal habitat. The 2019 BiOp (NMFS 2019a) determined that changes in water quality and turbidity due to seafloor disturbance by research gear and contamination from discharges and unauthorized spills would not be likely to adversely affect any ESA-listed species in the action area (NMFS 2019a).

Marine mammal species found in the action area consume krill, copepods, and various species of fish and invertebrates. As described in Section 9.1, AFSC trawling efforts under the proposed would impact less

than 122 km^2 of benthic habitat that supports prey species for some marine mammals. This is ~0.01% of available benthic habitat. As described in Section 9.2, marine mammal prey species are removed by AFSC and IPHC research activities; however, the amount of biomass taken is very small relative to commercial catch and available biomass.

Section 6.2.4 of the 2019 BiOp (NMFS 2019a) evaluated the effects of this removal of prey species on ESA-listed marine mammals and fish. The 2019 BiOp notes that direct competition between research activities and prey availability is unlikely for blue, fin, sei, bowhead, humpback, and sperm whales. The small quantities of potential prey items for these species that are removed by AFSC or IPHC research activities have a negligible effect on the overall abundance and availability of marine mammal prey. The small amount numbers of cod and sculpin removed by AFSC studies in the CSBSRA and BSAIRA are unlikely to affect availability of these prey for ringed seals (NMFS 2019a). Bearded seals consume mostly benthic crustaceans and are able to switch their diet to pelagic schooling fishes when readily available. AFSC research does not target benthic invertebrates and removes even smaller amounts of these organisms than fish (NMFS 2019a). Loss of sea ice affecting the nutrient cycle (NMFS 2019a) and collapse of crab populations also have the potential to affect food availability for seals.

However, there is overlap between AFSC/IPHC research removals of prey species for Steller sea lions, North Pacific right whales, and Cook Inlet beluga whales. The 2019 BiOp analyzed these removals under the context of effects to critical habitat and made the following conclusions:

- Cook Inlet beluga critical habitat – NMFS concluded that the reduction in prey availability due to research activities is very small, dispersed spatially and temporally, and likely to have minimal impact on critical habitat. This conclusion is still valid and is incorporated here by reference;
- North Pacific Right whale critical habitat – Species of large zooplankton are essential features of critical habitat for North Pacific right whales in areas where the whales feed. AFSC fisheries and ecosystem research surveys have very little impact on invertebrate species. While AFSC survey activities do occur in designated critical habitat for North Pacific right whales and could potentially impact benthic infauna and epifauna due to the use of bottom contact gear, pelagic zooplankton are unlikely to be affected; and
- Steller sea lion Critical habitat – Steller sea lions primarily prey on Atka mackerel, Pacific cod, and walleye pollock; these species are also taken in AFSC fisheries activities (NMFS 2019a). However, the research catch represents a very small fraction of the fisheries metrics and sustainable harvest limits in these areas, and are considered minor in magnitude. The low levels of prey removal during research are dispersed over large geographic areas and not annually repeated in the same location. In addition, the footprint of each trawl action is small because research tows are very short in duration, typically 20-30 minutes at depth.

Since the 2019 PEA was published, critical habitat has been designated in feeding areas for the Western North Pacific and Mexico DPSs of humpback whales (see Section 9.3.1). Potential impacts on this designated critical habitat could occur due to prey removals during AFSC fisheries research that might take place within the designated critical habitat areas. Humpbacks consume roughly 50% large zooplankton, along with small pelagic and miscellaneous fish (NMFS 2019a). The 2019 PEA and BiOp concluded that direct competition between research activities and humpback whale prey availability is unlikely (NMFS 2019a). The analyses and conclusions are valid also for the newly designated humpback

whale critical habitat with regards to the removal of prey PBF. Therefore, due to the nature of humpback whale critical habitat and its essential features, research activities would also not be expected to destroy or adversely modify this designated critical habitat.

Critical habitat has also been designated for the Beringia DPS of bearded seals (see Section 9.3.7) and the Arctic subspecies of ringed seals (see Section 9.3.6) since publication of the 2019 PEA and associated BiOp. For both species PBFs to be protected include sea ice habitat and availability of prey species. Sea ice habitat would not be affected by AFSC research activities such as trawling, longlining, or benthic sampling because these activities do not occur during ice covered seasons or in areas with ice cover. As described in Section 6.2, Steller sea lions are the only ESA-listed marine mammal species that only would be expected to be affected by exposure to terrestrial disturbance from the physical presence of researchers while they are hauled out.

The small quantities of prohibited fish species or benthic crustaceans removed or affected by AFSC research (see Sections 9.1 and 9.2) are unlikely to reduce the availability of these prey for ringed and bearded seals. As stated in the 2019 BiOp, research removals of cod and sculpin species that are prey for ringed seals are far less than 1% of the estimated biomass of these fish in the entire CSBSRA (NMFS 2019a). Bearded seals primarily consume crustaceans, which are taken in even smaller numbers by these research activities (NMFS 2019a). Therefore, the even smaller amounts of removals or disturbance to prey species that may occur in bearded and ringed seal critical habitat would not be expected to destroy or adversely modify this newly designated bearded and ringed seal critical habitat.

In summary, the minor removals of fish and other prey items due to AFSC and IPHC research activities as well as their temporary and dispersed nature across the action area reduce the likelihood of competition for prey to all ESA-listed species and designated critical habitat so as to be considered negligible and discountable.

10. ANTICIPATED EFFECTS OF HABITAT IMPACTS ON MARINE MAMMALS

As stated in Section 9, the proposed activities are not anticipated to result in impacts to marine mammal habitat nor to the food resources on which marine mammals depend. Therefore, long-term adverse impacts to marine mammals resulting from loss of or modification to marine mammal habitats as a result of the proposed activities are not expected.

11. MITIGATION MEASURES

AFSC considers the current suite of mitigation and monitoring measures as described in the *2024 Operational Mitigation Measures and Handling Procedures for Fisheries Research Conducted and Funded by the Alaska Fisheries Science Center and the International Pacific Halibut Commission* (Appendix B) to be necessary to avoid adverse interactions with protected species and still allow the AFSC and its cooperating partners to fulfill their scientific missions. Mitigation measures currently used during research as described in the 2024 manual are summarized in Table 11-1, with specific additions as noted in the subsections below. These measures are proposed for AFSC and IPHC research over the period 2024 – 2029. Mitigation measures and monitoring procedures will be reviewed by the AFSC Environmental Compliance Coordinator on a yearly basis and any changes to the procedures will be documented in future manuals and addressed during training sessions (see Section 11.1.3).

11.1.1. Specific Marine Mammal Monitoring and Mitigation Measures

All research vessels for AFSC and IPHC will conduct marine mammal monitoring at all times when underway and deploying gear. Because of limited berthing space and other constraints, a dedicated PSO may not be possible on every vessel. Therefore, the designated chief scientist, field party chief, lead sampler, or vessel captain will take on the role of Marine Mammal Visual Monitor (MMVM), or the chief scientist may assign another crewperson to fulfill the dedicated MMVM role at any given time, and to staff assigned these duties. Prior to the cruise, MMVMs receive training in marine mammal and sea turtle species identification and an MMVM packet that illustrates the AFSC Mitigation and Monitoring protocols including active avoidance, handling procedures, the move-on rule, recording, and reporting. Briefings between MMVM and any vessel crew who may look out for marine mammals occur prior to the start of all research activity, and again when new personnel join the crew.

Monitoring protocols, PSIT reporting, and operational and handling procedures are implemented whether occurring on AFSC, AFSC-supported, or IPHC cruises. MMVMs will watch for listed marine mammals and protected species, implement mitigation measures, and record significant observations and direct interactions with listed marine mammals or protected species. MMVMs will avoid continuous long durations (>4 hours at a time or a total of 12 hours per day) to prevent fatigue. As safety permits, the MMVM will be stationed where the best possible view can be maintained. MMVM will achieve 100% monitoring coverage of gear deployment areas. MMVMs will maximize eyes on the water time by employing an audio recorder or other data recorder.

MMVM will:

- Look and listen for marine mammals within 2 nm at least 15 minutes before approaching or occupying a study site or survey station and immediately report any sightings to the vessel operator so that appropriate avoidance procedures can be invoked;
- Watch for marine mammals during all activities from gear deployment to gear retrieval and between stations;
- Alert the vessel operator and vessel crew to the presence of any listed species (greater than 10 humpback whales or more than 2-3 individuals of other species (see Section 11.;

- Monitor for listed marine mammals and protected species during transit between stations; this will occur during daytime hours;
- When protected or listed species are present, direct all vessel action necessary to initiate mitigation procedures including, for example, humpback whale approach regulations and the move-on rule (see Section 11.1.2.1);
- Use the AFSC Protected Species Interaction Form (Appendix B) or another consistent reporting mechanism to document less common marine mammal sightings and all vessel/marine mammal direct interactions. Section 8 of Appendix B provides instructions on how and when to report encounters with protected species.

The MMVM will record:

- As much information as possible about observations and direct interactions including time; weather; viewing conditions; sea state; distance from vessel; depths; and numbers, sizes, and sex, of listed species. Marine mammals entering into the gear deployment area or waters within 92 m of the vessel;
- Sightings of less common marine mammals including Cook Inlet DPS beluga whale, North Pacific right whale, blue whale, or sperm whales;
- As many photos as possible of any observed North Pacific right whales; photos will be taken from an appropriate distance of > 460 m (500 yards).
- Marine mammals that do not move from a research site or survey station and any marine mammals that display unusual behavior or change behavior;
- Sightings of large groups of ESA-listed marine mammals such as a group of 10 or more humpback whales or groups of 3 or more other whales, ice seals, or Steller sea lions;
- Observations of Steller Sea lions at rookeries or haulouts and document any alert, startle, or movements as the research vessel operates in the area; critical habitat for Steller sea lions has been identified around major Steller sea lion haulout areas and rookeries[27]. Section 2.2.4 describes specific mitigation measures for major haulouts and rookeries; and
- Direct interactions where a marine mammal contacts the vessel, is captured by or contacts the research gear or is injured from the gear, or the animal is otherwise injured or killed due to the research operation.

The MMVM will immediately report to their Division Directorate:

- Any and all direct interactions between a marine mammal and the vessel or gear. Direct interactions include vessel strikes, gear strikes, capture, injury, and mortality.
- Significant observations of the following: any North Pacific right whale, Cook Inlet Beluga Whale, or any stampeding caused at Steller Sea Lion rookeries by the research operation.
- Direct interactions with any marine mammal or protected species. The Division Directorate will then notify the AFSC Environmental Compliance Officer, Alaska Region Protected Resources Specialists, and the Alaska Marine Mammal Stranding Network.

[27] https://media.fisheries.noaa.gov/dam-migration/steller-sea-lion-critical-habitat-alaska.pdf; Accessed October 21, 2022

MMVMs will be provided the following equipment:

- Satellite phone with contact information or email system to communicate direct interactions including injuries and mortalities to survey managers;
- Daily tide and current tables for the action area;
- Stopwatch or timekeeping device;
- High magnification binoculars;
- Rangefinder;
- Global Positioning System (GPS) and compass;
- PSIT or equivalent electronic forms;
- Electronic or hard copy of the final LOA;
- Electronic or hard copy of the final BiOp with Terms and Conditions; and
- Clipboard and pencils or computer, as available.

Additional mitigation measures that will be followed to lower the risk of vessel strikes of all listed species include:

- Based on recommendations from the MMVM, the vessel captain will actively avoid listed marine mammals using best professional judgement and will take direct action to avoid ship strikes such as slowing down, altering course, stopping, or even reversing course;
- Tow speed during surveys and transit speed between survey stations will be kept slow to minimize the risk of vessel strike; specific speeds are listed in (NMFS 2019a). AFSC and AFSC-supported research vessel speeds during trawling or deploying sampling will be less than 5kts. IPHC vessel speeds will be less than 4 kts when research vessels are actively setting gear, and less than 2 kts when hauling gear. When marine mammals or other protected species are present, tow durations will be kept short, when possible, to minimize interactions;
- When transiting between sampling stations in designated critical habitat for Steller sea lions, North Pacific right whales, or Cook Inlet beluga whales and when conducting acoustic surveys in these critical habitat areas, vessels will slow to an effective speed of 10 kts any time ESA-listed marine mammals are observed within an estimated distance of 0.5 nm;
- When transiting through passes in the Aleutian Islands and through the Bering Strait, the MMVM and vessel captain will be extra vigilant in maintaining a watch and will assign additional watch standers if possible due to heavy use of these passes by marine mammals, including North Pacific right whale;
- Vessels may conduct research operations at night, transit between stations, jog or run patterns to maintain position and sea friendliness, drift, or anchor as long as the MMVM and vessel Captain are extra vigilant in maintaining a watch, assigning additional watch standers, listening for blows, and/or delay operations in areas of likely marine mammal occurrence; and
- When deploying gear at night, forward areas of the ship can remain dark for navigation but visibility amidships and aft must be at least 46 m (50 yards) around the vessel. During night-time or limited visibility gear deployments, the research area around the ship will be searched for marine mammals before gear deployment.

11.1.2. Specific Humpback Whale, Cook Inlet Beluga Whale, Pacific Right Whale, and Steller Sea Lion Measures

Regarding vessel speeds:

- When transiting between sampling stations in designated critical habitats for Steller sea lion, North Pacific right whale, or Cook Inlet beluga whale and when conducting acoustic surveys in these critical habitat areas, vessels must slow to an effective speed of 10 kt any time the marine mammals are observed within an estimated distance of 0.5 nm.
- Additional species-specific measures are provided in the following subsections.

11.1.2.1. HUMPBACK WHALES

Vessels engaged in research activities will follow the Alaska Humpback Whale Approach Regulations at all times (see 50 CFR §§ 216.18, 223.214, and 224.103(b)). These regulations which apply to all humpback whales require that vessels:

- Do not approach by any means (*i.e.*, place the vessel in the path of an oncoming humpback whale), within 92 m (100 yards) of a humpback whale, or cause another vessel object to approach within 92 m of a humpback whale;
- Do not intercept or enter the path of oncoming humpback whales causing them to surface within 92 m of the vessel;
- Do not disrupt the normal behavior or ongoing activity of a whale by any other act or omission; and
- Operate at a slow, safe speed (see 33 CFR § 83.06) when near a humpback whale or whales.

11.1.2.2. NORTH PACIFIC RIGHT WHALES

Research vessels will also follow the right whale approach regulations at 50 CFR § 224.103(c) both within and outside of Pacific right whale critical habitat. Vessels will:

- Remain at least 460 m (500 yards) from North Pacific right whales;
- Will not travel through designated North Pacific right whale critical habitat if practicable (50 CFR 226.215).
- If traveling through North Pacific right whale critical habitat cannot be avoided, vessels will travel through the critical habitat at speeds of 5 kts or less (without a PSO on watch) or at 10 kts or less while PSOs maintain a constant watch for listed species from the bridge and vessels will maintain a log indicating the time and geographic coordinates at which they enter and exit the designated critical habitat.

11.1.2.3. STELLER SEA LIONS

For Western DPS Steller sea lions and their critical habitat, no-transit zones around Steller Sea lion rookeries and haulouts will be followed:

- Vessels will not approach within 3 nm (5.5 km) of rookery sites listed in 50 CFR § 224.103(d); and
- Vessels will not approach within 914 m (3,000 feet) of any Steller sea lion haulout or rookery.

AFSC and Alaska Regional Office Protected Resources Division staff will review any sites selected within 3 nm of rookeries and haulouts. If the review shows that disturbance at the rookeries or haulouts is unlikely from research activities at the selected survey station, then the station may be included, subject to the move-on rule and other mitigation measures described in Section 11.1.1. If this review shows that disturbance is likely, research activities at that station will be avoided between April 20 and June 30); during other time periods vessels should not transit within 2 nm of Steller sea lion rookeries and haulouts listed in the *2024 Operational Mitigation Measures and Handling Procedures for Fisheries Research Conducted and Funded by the Alaska Fisheries Science Center and the International Pacific Halibut Commission* (Appendix B). All regulations associated with Steller sea lion critical habitat will be followed (59 FR 30715). An additional mitigation measure for working around Steller Sea lion rookeries and haulouts will also be followed:

- If visible from the vessel, observe Steller Sea Lions at rookeries or haulouts and determine whether any alert, startle, or movement behavior is observed during the time the vessel is operating in the area, including any stampeding caused at Steller Sea Lion rookeries by the research operation.
- When transiting through passes in the Aleutian Islands and through the Bering Strait, the chief scientist and vessel operator will be extra vigilant in maintaining a watch and will assign additional watch standers if possible due to heavy use of these passes by marine mammals, including North Pacific right whale.

11.1.2.4. COOK INLET BELUGA WHALES

Specific mitigation measures for Cook Inlet Beluga whales and their designated critical habitat are:

- Project activity noise (such as from echosounders) in excess of the 120 dB threshold will not occur between the shoreline and the MLLW line in the Susitna Delta between April 15 and November 15.
- Any research vessels operating in or transiting through Cook Inlet will maintain a distance of at least 1.5 miles south of the MLLW line.

11.1.3. Additional Specific Mitigations Measures for Vessels

Vessel operators will:

- Maintain a watch for marine mammals at all times while underway (see Section 11.1.1);
- Stay at least 91 m (100 yards) away from listed marine mammals, except that they will remain at least 460 m (500 yards) away from endangered North Pacific right whales (see Section 11.1.2.2 for additional North Pacific right whale measures);
- Travel at less than 5 kts when within 274 m (300 yards) of a whale;
- Avoid changes in direction and speed within 274 m of a whale, unless doing so is necessary for maritime safety;
- Not position vessel(s) in the path of a whale, and will not cut in front of a whale in away or at a distance that causes the whale to change direction of travel or behavior (including breathing/surfacing pattern);

- Shift into neutral and remain in neutral when marine mammals are within 25 m (82 ft) of their vessel;
- Reduce vessel speed to 10 kts or less when weather conditions reduce visibility to 1.6 km (1 mile) or less.
- Follow the Alaska Humpback Whale Approach Regulations when vessels are transiting to and from research stations (see Section 11.1.2.1 for details on humpback whale measures).
- If a whale's course and speed are such that it will likely cross in front of a vessel that is underway, or approach within 91 m (100 yards) of the vessel, and if maritime conditions safely allow, the engine will be put in neutral and the whale will be allowed to pass beyond the vessel, except that vessels will remain 460 m (500 yards) from North Pacific right whales;
- Vessels will not allow research gear lines to remain in the water unless both ends are under tension and affixed to vessels or gear.

11.1.4. Training

In addition to the training for MMVMs described in Section 11.1.1 yearly training for all chief scientists and vessel crew is offered by the AFSC Environmental Compliance Coordinator on a regular basis. The training includes a review of the most recent version of AFSCs *Operational Mitigation Measures and Handling Procedures for Fisheries Research Conducted and Funded by the Alaska Fisheries Science Center and the International Pacific Halibut Commission* (Appendix B provides the 2024 version) and topics such as monitoring, preventing, and avoiding protected species. The training also includes reporting mechanisms, species identification, and procedures for handling protected species. All AFSC research crew members who may be assigned to monitor for the presence of marine mammals during surveys are required to attend an initial training course and refresher courses annually or as necessary so that they adequately learn the mitigation measures. During post-survey debrief discussions, the AFSC Environmental Compliance Coordinator will note any professional judgment used to avoid an interaction with marine mammals and will include these measures in future training sessions.

Table 11-1. Proposed Mitigation and Monitoring Measures

Type of Survey	Mitigation and Monitoring Measure

General Measures Applicable to All Surveys	• Coordination and Communication: In advance of each survey, coordination with the NOAA Office of Marine and Aviation Operations or other relevant parties to ensure clear understanding of the mitigation measures and the manner of their implementation. Conduct briefings at the outset of each survey and as necessary with the ship's crew. Chief scientist to coordinate with Officers on Deck (OOD) or equivalent to ensure procedures are understood.
	• The AFSC compliance officer will add mitigation measure language to all NOAA ship project instructions, charter vessel contracts, and applications for scientific research permits. The compliance officer will also communicate with IPHC staff to ensure mitigation measure materials are consistent with those of AFSC.
	• Prior to each survey a mitigation kit will be required for each vessel conducting research. The kit will include: range-finding binoculars; protected species encounter forms; the current AFSC mitigation manual; copies of permits; identification guides; tissue sampling kits; etc. (see Appendix B for addition details).
	• Vessel speed: if vessel crew or dedicated observers observe protected species that may intersect the vessel, they will immediately communicate with the bridge for appropriate course alteration or speed reduction as possible. When transiting between sampling stations, AFSC research vessels will cruise at 6-14 kts but average about 10 kts.
	• Vessels engaged in research will follow the NMFS Code of Conduct for Marine Mammal Viewing (https://www.fisheries.noaa.gov/alaska/marine-life-viewing-guidelines/Alaska-marine-mammal-viewing-guidelines-and-regulations) and will:
	  • Remain at least 92 m (100 yards) from marine mammals;
	  • Time spent observing individual(s) animals will be limited to 30 minutes;
	  • Whales will not be encircled or trapped between boats or boats and shore.
	  • If approached by a whale, will put the engine in neutral as sea conditions allow and allow the whale to pass.
	• Tow speed during surveys and transit speed between survey stations will be kept slow to minimize the risk of vessel strike; specific speeds are listed in (NMFS 2019a). AFSC and AFSC-supported research vessel speeds during trawling or deploying sampling will be less than 5 kts. IPHC vessel speeds will be less than 4 kts when research vessels are actively setting gear, and less than 2 kts when hauling gear. When marine mammals or other protected species are present, tow durations will be kept short, when possible, to minimize interactions.
	• Protected Species Training: Conduct a formalized protected species training program for all crew members that are part of AFSC-affiliated research and cooperative research. Training will include topics such as monitoring and sighting protocols, species identification, decision-making factors avoiding take, procedures for handling and documenting protected species interactions, and reporting requirements.
	• Review written protocols for avoiding adverse interactions with protected species make them fully consistent with training materials and guidance. In addition, review informational placards and reporting procedures and update as necessary.
	• Incorporate specific language into vessel and cooperating partner contracts that stipulates all training requirements, operating procedures and reporting requirements.
	• Protected species watches shall be conducted by watch-standers (those navigating the vessel and/or other crew) at all times when the vessel is being operated. AFSC will convey this requirement to IPHC.

Type of Survey	Mitigation and Monitoring Measure
	• Monitors will avoid continuous long durations (>4 hours at a time or a total of 12 hours per day) to prevent fatigue. As safety permits, the monitors will be stationed where the best possible view can be maintained and will achieve 100% monitoring coverage of gear deployment areas. Monitors will maximize eyes on the water time by employing an audio recorder or other data recorder. • When deploying any type of sampling gear at sea monitoring for any unusual circumstances will be done and professional judgement will be used to avoid any risks to marine mammals during use of all research equipment. This requirement will be conveyed to IPHC. • AFSC will designate a compliance coordinator who shall be responsible for ensuring compliance with all requirements. AFSC will convey this requirement to IPHC. • Implement the handling or disentanglement protocols, when necessary, and convey this requirement to IPHC. • Incorporate specific language into vessel and cooperating partner contracts that stipulates all training requirements, operating procedures and reporting requirements. • Do not approach within 1 km of locations where marine mammals are aggregated, including pinniped rookeries and haulouts.
Surveys Using Trawl Gear	• For all trawl surveys (surface, midwater and bottom), the OOD, chief scientist (or other member) and crew standing watch on the bridge will scan for protected species using binoculars during all daytime operations. The goal is 360-degree monitoring coverage around the vessel. • Trawling at night will be minimized as much as possible. • No offal will be discarded immediately prior to trawling at a station. • Surface trawl nets must use acoustic deterrent devices (pingers, see below). • Third wires will be limited to use on mid-water trawls conducted during summer and winter acoustic surveys that target groundfish such as walleye pollock. • For all trawl surveys, the period of protected species monitoring will begin about 10 min before the vessel is on station and extends continuously until the net has been retrieved. • Scan the surrounding waters with the naked eye and range-finding binoculars. the monitoring period for protected species begins before the vessel arrives on station and extends continuously through gear deployment, typically for over 30 min on all trawl types. • The chief scientist must confirm with the captain or the bridge that no marine mammals or other protected species have been seen within 500 m of the ship or appear to be approaching the ship during a 10-min period prior to the deployment of any trawl gear. • For surface trawls using the Nordic 264 trawl, two pairs of acoustic signaling devices known as “pingers” are installed near the net opening, one on either side. Acoustic pingers, when submerged, emit an underwater pulse of sound, or “ping”. The intent of these devices is to discourage protected species from

Type of Survey	Mitigation and Monitoring Measure
	entering the net. All Nordic 264 trawl nets will be fitted with marine mammal exclusion devices. • Whenever surface trawl nets are used in southeast Alaska, AFSC will install and use acoustic deterrent devices, with two pairs of the devices installed near the net opening. AFSC must ensure that the devices are operating properly before deploying the net. • If protected species are sighted within 500 m of the vessel and are considered at risk of interaction before setting the gear, the OOD may decide to implement the "move-on" rule and transit to a different section of the sampling area. If Orcas are observed at any distance within any research area, the "move-on" rule is applied. In lieu of moving on, the vessel can remain on site for 10 mins to see if the animals move. If animals do move on, the monitors will watch for another 10 mins and if there are no other sightings the gear can be deployed. Trawl gear will not be deployed if protected species are sighted near the ship unless there is no risk of interaction as determined by the OOD or CHIEF SCIENTIST. • After moving on, monitoring protocols continue as reconnaissance of the new location is conducted and any other scientific gear is deployed (CTDs, bongos, etc.), a period of at least 10 mins since moving to the new location. If protected species are still visible from the vessel and appear at risk, the OOD may decide to move again or skip the station. The OOD and chief scientist may discuss strategies for avoid takes of these species. • If trawling is delayed because of protected species presence, trawl operations only resume when the animals have no longer been sighted or are no longer at risk. • Conduct trawl operations upon arrival on station to the extent practicable. • Continue visual monitoring while gear is deployed. If protected species are sighted before gear retrieval, the chief scientist, watch leader, or OOD will determine the best action to minimize interactions with animals. • During nighttime operations, observe with the naked eye and any available vessel lighting. • If deploying bongo plankton or other small net prior to trawl gear, continue visual observations until trawl gear is ready to be deployed. • Care will be taken when emptying the trawl, including opening the cod end as close as possible to the deck of the checker (or sorting table) in order to avoid damage to protected species that may be caught in the gear but are not visible upon retrieval. • Conduct standard tow durations of no more than 30 mins excluding deployment and retrieval at target depths for less than 3 nm. • Clean gear prior to deployment. Empty gear as quickly as possible to ensure no protected species are entangled.
Surveys Using Gillnet Gear	• Gillnet operations will be conducted as soon as is practicable upon arrival at the sampling station. • Marine mammal watches (visual observation) will be conducted prior to beginning of net deployment as described above for trawl gear. • The "move-on" rule will be implemented as described above for trawl gear.

Type of Survey	Mitigation and Monitoring Measure
	• If no marine mammals are present, the gear is set and monitored continuously during the soak. If a marine mammal is sighted within 92 m (100 yds) during the soak and appears to be at risk of interaction with the gear, then the gear is pulled immediately in order to minimize the time the net is in the water and exposed to nearby marine mammals. Acoustic pingers are always used to reduce the chance of encounters. Small mesh gillnets are used in AFSC surveys, which may further reduce interactions with marine mammals. • AFSC shall maintain visual monitoring effort will be continued during the entire period of time that gillnet gear is in the water (*i.e.*, throughout gear deployment, fishing, and retrieval). • If gillnet operations have been suspended because of the presence of marine mammals, they will resume when practicable· only when the animals are believed to have departed the area. AFSC may use best professional judgment in making this determination. • Acoustic deterrent devices will be installed and used on all gillnets. AFSC will ensure that the devices are operating properly before deploying the net.
Beach Seine Gear	• Visually survey the area for protected species prior to set. • Do not make the set if hauled out pinnipeds are within 200 m. • Lift and remove the gear from the water if protected species are observed to be interacting with it.
Setline and Longline Surveys, and Hook and Line or Rod and Reel Surveys	• Conduct visual monitoring at least 30 mins prior to the setting the gear. • Implement the "move on" rule if any protected species are present near the vessel and appear to be at risk of interactions. • Deploy gear as soon as possible upon arrival on station (depending on marine mammal presence). • Maintain visual monitoring throughout deployment and gear retrieval. • Retrieve the gear as quickly as possible in order to minimize interactions • If setting operations have been halted due to the presence of the protected species, setting can resume only if no protected species have been observed for at least 30 mins. • If protected species are detected in the area and are at risk of entanglement, haul-back of the gear may be postponed until the officer on watch determines that it is safe to proceed. • Chumming is prohibited. Bait must be removed from hooks during longline retrieval and retained on the vessel until all gear is removed from the area. • On AFSC survey vessels, catch is processed aboard the vessel, and offal is macerated and discharged off the side opposite of gear retrieval. This minimizes the attraction to marine mammals. • Monitoring and baiting procedures for hook and line and rod and reel gear are the same as those for longline gear. • On IPHC survey vessels, bait and undesirable fish are immediately returned to the sea. Due to the small vessels and amount of catch, it is impossible to retain the catch and discard it at another time. Low documented take rates indicate that the current protocols used by both the AFSC and IPHC surveys

Type of Survey	Mitigation and Monitoring Measure
	to discharge offal, used bait, and discards are conservative processes that reduce the rate of interaction with marine mammals. • Aboard AFSC longline surveys all halibut are released at the hook and not brought on board. During IPHC surveys it is assumed that halibut would be brought on board for weighing and measuring. As is done with offal, the surveyed, living halibut are released on the opposite side of the ship to avoid additional interactions with any marine mammals that might have been attracted to the long line. • IPHC may drop or leave gear to then go to retrieve another line to give any marine mammals observed the chance to leave the area near the first line.
Pot and Trap Gear	• Use of weighted lines is required for crab traps. • If beach traps are used, fit them with aluminum bars to prevent protected species from entering the holding/collection area.
Plankton Nets, Fyke Nets, Cast Nets, Small-mesh Towed Nets, Oceanographic and Water Sampling Devices, Divers, and Video Cameras	• These gear types are not considered to pose risk to protected species because of their small size, slow deployment speeds, and structure. Therefore, no specific mitigation measures are required. However, the officer on watch and crew will monitor for any unusual circumstances that may arise at a sampling site and use professional judgment and discretion to avoid any potential risks to protected species during deployment.
UxS including UASs (Drones) and USVs (Saildrones)	• Use of UAS must comply with applicable Federal Aviation Administration (FAA) regulations. • UAS only to be flown by an experienced operator. • UAS altitudes may range up to 400 ft above ground level depending on the method of use (*i.e.*, flying transects or targeting specific species) or species involved. UASs will not be flown directly over pinniped haulouts. • UAS flights will be line of sight in accordance with FAA regulations and in accordance with applicable sections of NOAA's UAS Policy 220-1-5 (NOAA 2019). • Use of USVs such as Saildrones or ROVs pose minimal risk to protected species but researchers must follow standard avoidance measures before deployment.
Handling Procedures for Incidentally Captured Marine mammals (see Appendices B and C for additional details)	• Handling Procedures: Implement AFSC established protocols to reduce interaction with protected species following a step-wise order; 1) ensure health and safety of crew; depending on how and where an animal is hooked or entangled, take action to prevent further injury to the animal; 3) take action to increase the animal's chance of survival; and 4) record detailed information on the interaction, actions taken and observations of the animal throughout the incident. • Captured live or injured protected species are released from research gear and returned to the water as soon as possible with no gear or as little gear remaining on the animal as possible. Animals are released without removing them from the water if possible. Data collection is conducted in such a manner as not to delay release of the animal(s) and should include species identification, sex identification if genital region is visible, estimated length, disposition at release (*e.g.*, live, dead, hooked, entangled, amount of gear

Type of Survey	Mitigation and Monitoring Measure
	remaining on the animal, etc.) and photographs. The chief scientist or crew should collect as much data as possible from hooked or entangled animals, considering the disposition of the animal; if it is in imminent danger of drowning, it should be released as quickly as possible. Biological samples could only be collected in accordance with section 109(h)(1) of the MMPA for live/dead protected species (non-listed) or under a directed scientific research and enhancement permit. • If a large whale is alive and entangled in fishing gear, the vessel should immediately call the U.S. Coast Guard at VHF Channel 16 and/or the appropriate Marine Mammal Health and Stranding Response Network. Entangled whales may be reported to the NOAA Fisheries entanglement reporting hotline (1-877-767-9425). • The chief scientist will submit data on all captured animals to marine mammal experts at the appropriate NMFS Science Center who will use specific criteria to determine whether the injury is considered serious (*i.e.*, more likely than not to result in mortality). If insufficient data has been collected for any reason, the marine mammal experts may not be able to determine the severity of the injury. However, the marine mammal experts may use other types of information to assign the injury to either lethal or non-lethal categories.

12. MITIGATION MEASURES TO PROTECT SUBSISTENCE USES

Please refer to the Communication Plan attached to this LOA application as Appendix C. This document describes AFSC's commitment to minimize any adverse effects on the availability of marine mammals for subsistence uses through extensive communication and collaboration with Alaska Native hunters and fishers throughout the Arctic. The draft document has not yet been approved by all the necessary parties, including the appropriate Alaska Native representatives, but it is a high priority for the AFSC and the terms and procedures will be finalized in consultation with Alaska subsistence communities during the rulemaking process.

13. MONITORING AND REPORTING

13.1. Monitoring

Specific marine mammal monitoring measures are described in detail in Sections 11.1.1 and 11.1.2 and are summarized in Table 11-1. Marine mammal watches are a standard part of fisheries research activities, particularly when using gears such as longlines, purse seines and mid-water trawls that may or are known to interact with marine mammals. While underway, watches are generally conducted by vessel crew or members of the scientific party (those navigating or working on the vessel and other crew) at all times when the vessel is being operated. These individuals are referred to as 'watch-standers'. The primary focus for this type of watch is to avoid striking marine mammals and to generally avoid navigational hazards. The watch-standers do not record or report marine mammal sightings except when gear is being deployed or retrieved. In most cases, these watches are not conducted by dedicated staff; these personnel may have other duties associated with navigation and other vessel operations. Specific monitoring requirements for vessels are described in Section 11.1.3.

Observing and monitoring for marine mammals is conducted prior to deploying longlines, trawls and other research gear, and continues until gear is returned on board (see Table 11-1). Observations and monitoring are conducted by dedicated scientists with no other responsibilities during the watch period. Observers record the number of each species and their behaviors. This information can be valuable in understanding whether some species may be attracted to vessels or gears.

13.2. Reporting

The *2024 Operational Mitigation Measures and Handling Procedures for Fisheries Research Conducted and Funded by the Alaska Fisheries Science Center and the International Pacific Halibut Commission* (Appendix B) describes specific AFSC reporting procedures that are summarized below. Generally, annual reporting will discuss the activities that were conducted, the results of the monitoring program, and the implementation of mitigation measures including:

- Summary of the activity (dates, times, and specific locations, project actions, durations and sources actually completed) and any changes from the activities proposed in the application;
- Summary of mitigation implementation;
- Detailed monitoring results as well as a comprehensive summary including:
    - Number, species, and relevant information regarding marine mammals observed and estimated exposures/takes;
    - Description of observed marine mammal behaviors (during presence or absence of activities);
    - Environmental conditions when observations were made.
- Assessment of the effectiveness of mitigation and monitoring measures.
- AFSC will coordinate with the local Alaska Regional Stranding Coordinator and the NMFS Stranding Coordinator to report any unusual marine mammal behavior and any stranding, beached (alive or dead), or floating marine mammals that are encountered during field research activities. In addition, cruise leaders or chief scientists provide reports to AFSC leadership and to the OPR by event, survey leg and cruise. When marine mammals interact with the gear and are

killed or released alive, the report fully describes any observations of the animals, the context (vessel speed and conditions), decisions made and rationale for decisions made in vessel and gear handling. The circumstances of these events are critical in enabling AFSC and the OPR to better evaluate the conditions under which takes are most likely occur and potentially avoid some of these situations in the future.

For this purpose, NMFS has established a formal Level A incidental take reporting system, the PSIT database, requiring that incidental takes of protected species be reported within 48 hours of the occurrence. PSIT generates automated messages to agency leadership and other relevant staff alerting them about the event. Information about the circumstances of the event are added to the PSIT database. The PSIT and chief scientist reports provide valuable real-time reporting and help with disseminating information while also serving to archive information that could be mined later to evaluate why takes occur, which species seem particularly vulnerable (or not) and what gear types have higher likelihood of interactions, etc. While a single reporting mechanism is most desirable, AFSC plans to continue uploading data to the PSIT database as well as documenting species interactions in the form of reports as described here.

AFSC will submit an annual report of all takes of marine mammals, including geographic coordinates of activities at the time of the observation, closest approach of mammals to research activities, and any required mitigation measures implemented. In addition, Table 13-1 provides information on required documentation when to report encounters, and contact information for reporting protected species observations and interactions. the AFSC Compliance Coordinator will be included in all communications.

Table 13-1. Marine Mammal Encounter Reporting Information

Type of Encounter	When to Report	Required Documentation	Reporting Contacts
Significant observation, all except North Pacific right whale	End of survey	• AFSC Protected Species Encounter Form (APSEF) hard copy and digital format • Photos and videos	• Division Directorate • Rebecca Reuter AFSC Compliance Coordinator Ph: 1-206-526-4234 Email: Rebecca.Reuter@noaa.gov
Significant observation of a North Pacific right whale	Immediately	• APSEF hard copy and digital format • Photos and videos	
Direct Interaction with any marine mammal	Immediately	• APSEF hard copy and digital format • AFSC Protected Species Handling Form hard copy and digital format • Photos and videos • PSIT	
Stranding/entanglement not associated with research activities	Immediately	• Photos • Date, time and location of stranding or entanglement	• AK Regional Stranding Network 1-877-925-7773 • Mandy Keough 1-907-586-7070 • Barbara Mahoney Office 1-907-271-3448 • Barbara Mahoney Cell 1-907-360-3481 • Alaska Sea Life Center 1-888-774-7325 • Rebecca Reuter AFSC Compliance Coordinator Ph: 1-206-526-4234 Email: Rebecca.Reuter@noaa.gov

Source: The 2024 Operational Mitigation Measures and Handling Procedures for Fisheries Research Conducted and Funded by the Alaska Fisheries Science Center and the International Pacific Halibut Commission (Appendix B).

13.2.1. AFSC Specific Reporting Requirements

As described in the *2024 Operational Mitigation Measures and Handling Procedures for Fisheries Research Conducted and Funded by the Alaska Fisheries Science Center and the International Pacific Halibut Commission* (Appendix B), AFSC policy requires the following specific documentation for encounters with protected species:

- APSEF – to be used if the "Move-on" rule is employed, for significant observations, and for direct interactions. This form can be found in Appendix B of this application.
- AFSC Protected Species Handling Form – to be used when a direct interaction allows for the collection of meristic and/or biological data from a protected species. This form can be found in Appendix B of this application.
- Photos and videos – whenever an uncommon protected species is observed, when there is a direct interaction with a protected species, see form for desired data.
- PSIT database – to be filled out immediately after there is a direct interaction with a protected species. Appendix B provides instructions for entering data into PSIT.

For photos and videos:

- Please remember to set the date and time on the camera you are using!
- For marine mammals:
  - Imagery is used by MML scientists to verify species and sex identifications.
  - Videos can be very useful, especially for animals moving near the vessel (they can be difficult to photograph).
  - Try to include distinguishing marks of the individuals in your photos: pinniped brands and/or flipper tags; scars, scratches, and the saddle patches on killer whales are useful for identifying individuals.

13.2.2. Unauthorized Take

In the unanticipated event that unauthorized take occurs or if a stranded, injured, sick or dead animal not associated with AFSC is encountered, AFSC would implement the following procedures.

- If a marine mammal is determined by the cruise leader or chief scientist to have been disturbed, harassed, harmed, injured, or killed (*e.g.*, is injured or killed as a direct or indirect result of this action), AFSC will report the incident to NMFS within one business day, with information submitted to Jolie.Harrison@noaa.gov and the Regional Stranding Coordinator. Reporting will include:
  - Number of animals of each species affected;
  - Date, time, and location of each event (provide geographic coordinates);
  - Description of the event;
  - If a vessel struck a marine mammal, the contact information for the observer on duty or chief scientist on duty; and
  - Photographs or video footage of the animal(s) (if available).

13.2.3. Stranded, Injured, Sick or Dead Marine Mammal (not associated with Research)

- If an observer, cruise leader or chief scientist observe an injured, sick, or dead marine mammal (*i.e.*, stranded marine mammal), they will notify the Regional Marine Mammal Stranding Hotline at 866-767-6114 (see Table 13-1). Photos and available data to aid NMFS in determining how to respond to the stranded animal will be provided. If possible, data submitted to NMFS in response to stranded marine mammals will include date/time, location of stranded marine mammal, species and number of stranded marine mammals, description of the stranded marine mammal's condition, event type (*e.g.*, entanglement, dead, floating), and behavior of live-stranded marine mammals.
- Marine mammals entangled in derelict gear (not associated with AFSC research) will be reported to the Derelict Gear Hotline: 1-855-542-1964.
- Illegal Activities:
    - If an observer, cruise leader or chief scientist observe marine mammals being disturbed, harassed, harmed, injured, or killed (*e.g.*, feeding or unauthorized harassment), these activities will be reported to NMFS Region Office of Law Enforcement at (1-800-853-1964).

14. SUGGESTED MEANS OF COORDINATION

NMFS provides annual funding to universities, research institutions, federal laboratories, private companies, and independent researchers around the world to study marine mammals. AFSC actively participates on Take Reduction Teams and in Take Reduction Planning, and conducts a variety of studies, convenes workshops and engages in other activities aimed at developing effective bycatch reduction technologies, gears and practices.

To reduce marine mammal takes over time, AFSC maximizes efficient use of ship time. AFSC implements an adaptive management approach to evaluating actual takes of marine mammals and continues to revisit mitigation measures. In consultation with OPR, if actual takes exceed those requested in Section 6.4 of this application, AFSC may request changes to current mitigation measures to improve efficacy or to implement additional measures to reduce take levels.

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Appendix A

Descriptions of AFSC Gear and Vessels

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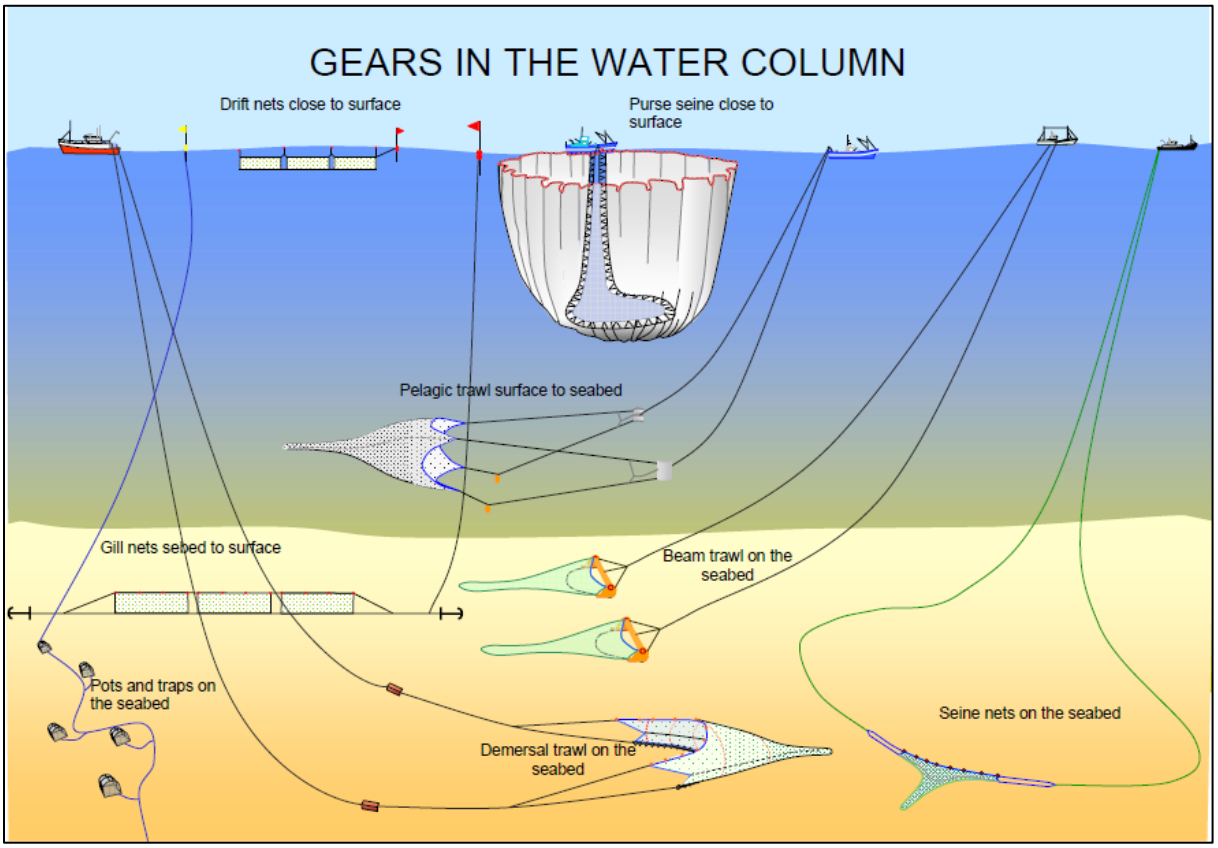
1. Net-Based Gear

Various types of sampling gear composed of or containing nets are used by the AFSC in order to catch or trap marine organisms for study. Figure A-1 depicts several types of commercial fishing net gear.



Credit: Seafish 2005. Note: not all depicted gear types are used in AFSC research.

Figure A-1 Fishing gears in the water column

Trawl Nets

A trawl net is a funnel-shaped net towed behind a boat to capture organisms. Trawl nets are made of four basic parts – the opening (or, 'mouth') of the net, the spreading mechanism, the body of the net, and the codend (or, 'bag') (Figure A-2). The mouth is held open vertically using floatation on the upper edge, or 'headrope,' and weights on the lower edge, or 'footrope.' In most trawls used in AFSC research, the mouth is spread open horizontally during fishing using steel trawl doors. In some types of trawl nets, such as beam trawls, the mouth is spread open by a rigid bar called a 'beam'. Large panels of wide mesh at the horizontal reaches of the mouth, called 'wings', are connected to the trawl doors. The mouth of the net is held open (horizontally and vertically) by the hydrodynamic force exerted on the trawl doors attached to the wings of the net, floats placed on the headrope, and the net itself as the vessel moves forward.

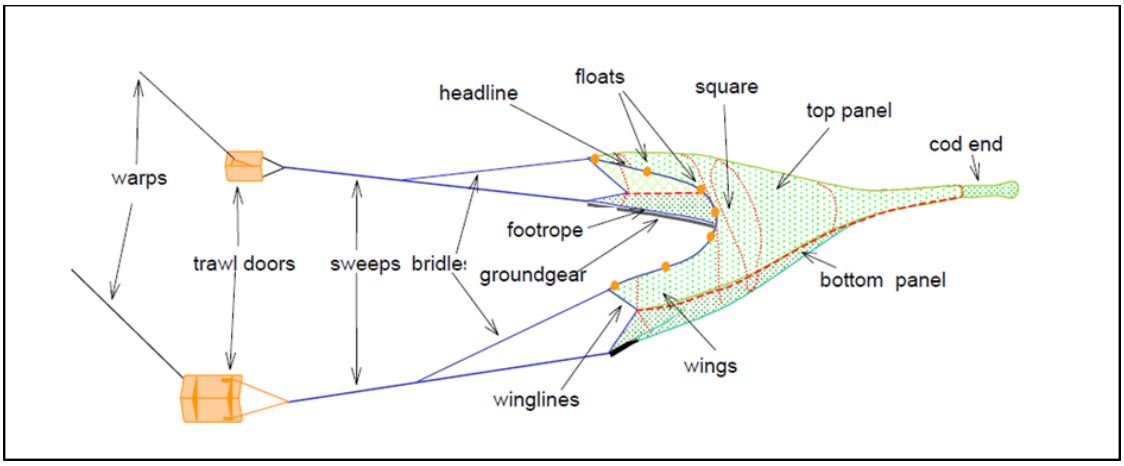


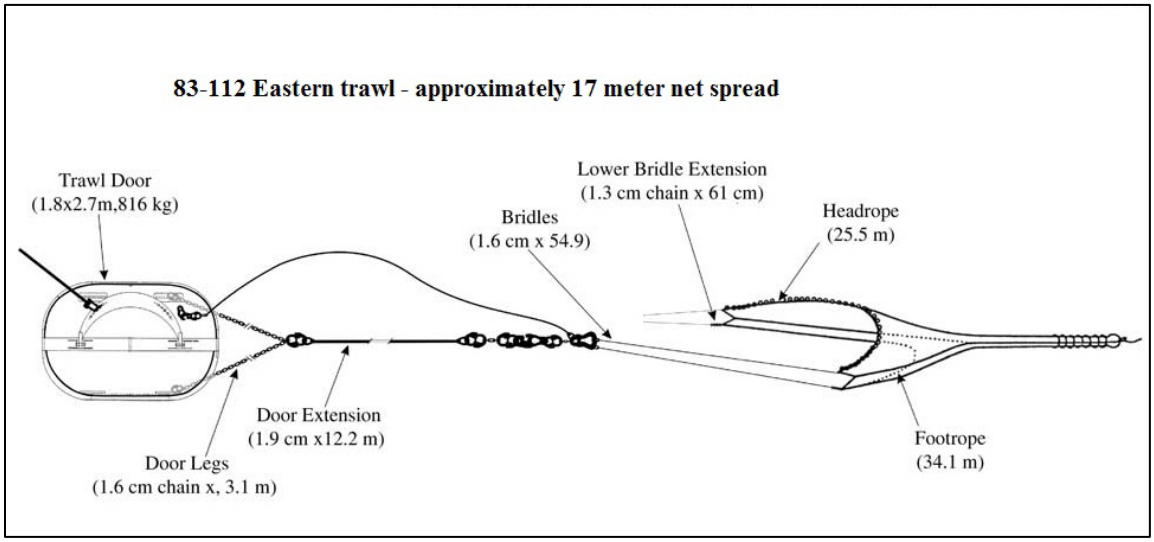
Figure A-2 Otter bottom trawl illustration

The body of the trawl net is made of panels of different sized mesh (Figure A-5). Mesh size is largest at the wings and near the mouth and, depending on construction of the net and target species, mesh size gets progressively smaller towards the codend portion of the net. The codend has the finest mesh of the net and is where fish and other organisms larger than the mesh size are retained. In contrast to commercial fishery operations, which generally use larger mesh to capture marketable fish, research trawls often use smaller mesh throughout the net to catch fish of many sizes. This helps to make estimates of the size and age distributions of fish in a particular area. Research trawls typically have much smaller openings, from 10 to 17 m compared to commercial trawls that can have openings over 90 m.

The trawl net is usually deployed over the stern of the vessel, and attached with two cables, or 'warps,' to winches on the deck of the vessel. The cables are paid out until the net reaches the fishing depth. The duration of the tow depends on the purpose of the trawl, the catch rate, and the target species. AFSC trawl surveys typically involve tow speeds from two to four knots and tow durations from 10 to 45 minutes. At the end of the tow, the net is retrieved and the contents of the cod end are emptied onto the deck or sorting table. For research purposes, the speed and duration of the tow and the characteristics of the net must be standardized to allow for meaningful comparisons of data collected at different times and locations. Active acoustic devices incorporated into some research vessels and trawl gear may be used to monitor the position and status of the net, speed of the tow, and other variables important to the research design.

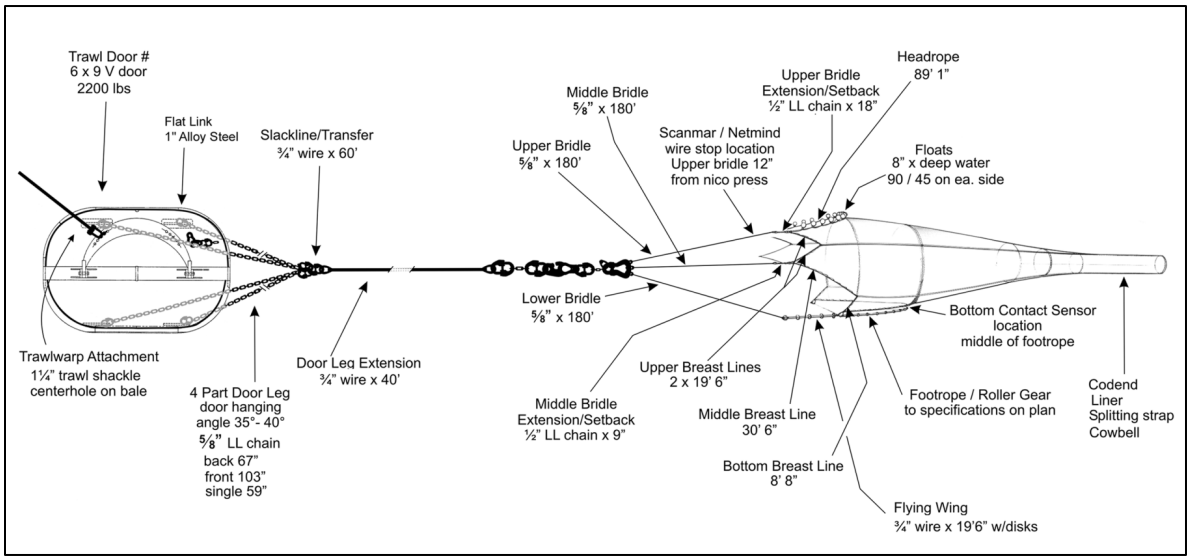
AFSC research trawling activities use both 'pelagic' (surface or mid-water) trawls, which are designed to operate at various depths within the water column, as well as 'bottom' trawls, which are designed to capture target species at or near the seafloor. Bottom trawls often have bobbins or roller gear to protect the footrope as the net is dragged along the seabed. Within these two basic deployment methodologies, there are many different designs used by the AFSC oriented to the basic needs of each survey or target species. Common bottom trawls include the 83-112 Eastern Trawl (Figure A-3) used in the Bering Sea

Bottom Trawl Survey and the more fortified Poly Nor'eastern (PNE) bottom trawl (Figure A-4) used in the Aleutian Islands, Bering Sea Slope, and Gulf of Alaska Bottom Biennial Bottom Trawl Surveys. AFSC also uses push trawls (Figure A-5) during the Yukon Delta Nearshore Surveys. Push trawls differ from most other trawls in that vessels push nets in shallow, nearshore waters.



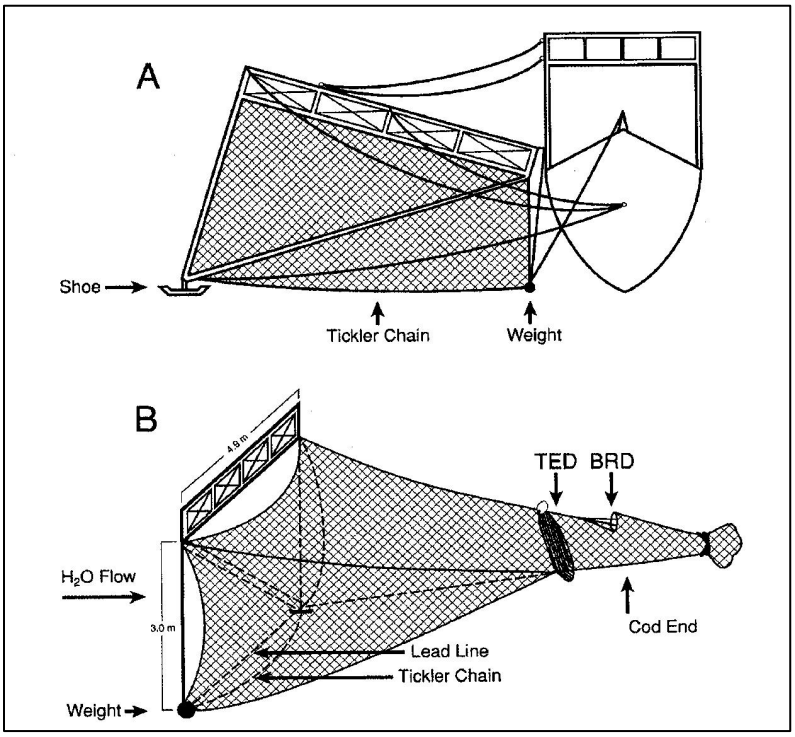
Credit: SFOS 2015

Figure A-3 83-112 Eastern trawl illustration



Credit: Stauffer 2004

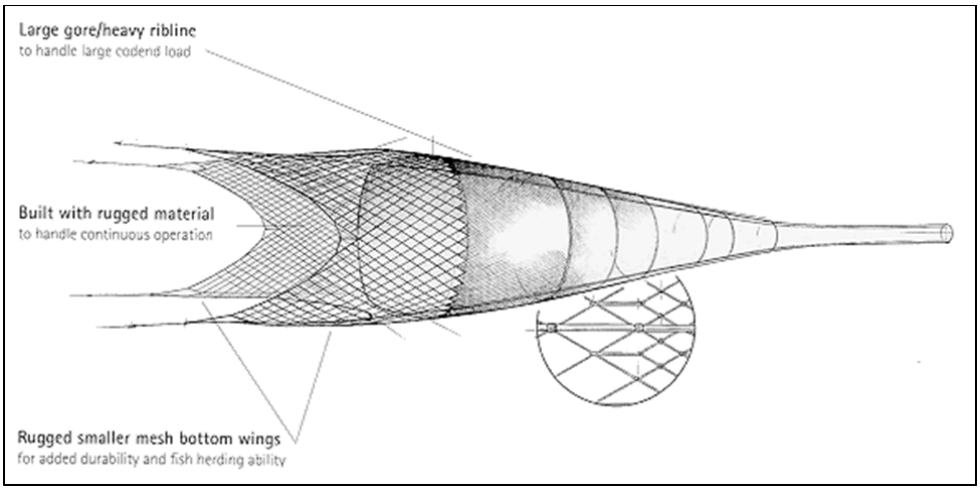
Figure A-4 Poly Nor'eastern bottom trawl illustration



Credit: NOAA 2014; Push trawls used by the AFSC do not include a Turtle Excluder Device (TED) or Bycatch Reduction Device (BRD)

Figure A-5 Push trawl illustration

Midwater trawls include the Nordic 264 trawl, anchovy trawl, Cantrawl, Marinovich trawl, and Aleutian wing trawl (Figure A-6) used on the Acoustic Trawl Surveys, and the Kodiak trawl (Figure A-7) used in the Yukon Delta Nearshore Surveys. AFSC construction, repair, and use of the bottom trawl survey trawls adhere to national standards (Stauffer 2004).



Credit: Net Systems Inc. 2016

Figure A-6 Aleutian wing pelagic trawl illustration

Credit: California Department of Fish and Wildlife 2015

Figure A-7 Kodiak trawl

A beam trawl (Figure A-8) is a type of bottom trawl that uses a wood or metal beam to hold the net open as it is towed along the sea floor. The beam holds open the mouth of the net and trawl doors are not needed. Beam trawls are generally smaller than other types of bottom trawls. Beam trawls used by the AFSC typically use beams less than or equal to 3 m in length for post-larval, juvenile fish and invertebrate surveys.

Credit: SFOS 2015

Figure A-8 Plumb staff beam trawl

A nephrops trawl is designed to be towed over rough seabeds where nephrops may be found. The mouth of the net is held open by a pair of otter boards (trawl doors) and the net is fitted with a rock hopper footrope to tow over such 'patchy' areas. Generally, nephrops trawl nets are towed in areas of low concentrations of other fish but are fitted with legislation square mesh panels. The gear that contacts the seabed is made up of large rubber discs spaced out using smaller rubber discs between them, all of which is threaded onto either wire or chain. While the gear may appear heavy, it is quite light and is designed to 'bounce' easily over the rough bottom that may be interspersed with muddy seabeds[1].

Plankton Nets

AFSC research activities include the use of several plankton sampling nets which employ very fine mesh to sample plankton and fish eggs from various parts of the water column. Plankton sampling nets usually consist of fine mesh attached to a rigid frame. The frame spreads the mouth of the net to cover a known surface area. Many plankton nets have a removable collection container at the codend where the sample is concentrated. When the net is retrieved, the catch is washed to the cod end with a saltwater hose and then the collecting bucket can be detached and easily transported to a laboratory. Plankton nets may be towed through the water horizontally, vertically, or at an oblique angle. Often, plankton nets are equipped with instruments such as flow meters or pitch sensors to provide researchers with additional information about the tow or to ensure plankton nets are deployed consistently. Plankton nets are generally used to

[1] https://www.seafi sh.org/responsible-sourcing/fi shing-gear-database/gear/demersal-trawl-nephrops-hopper-trawl; Accessed August 8, 2023.

collect marine organisms for research purposes, and are not used for commercial harvest. AFSC plankton nets employ mesh sizes from 63 to 500 micrometers (µm).

To capture plankton with vertical tows, the AFSC uses ring nets or CalVET nets. A ring net consists of a circular frame and a cone-shaped net with a collection jar at the codend. The net, attached to a labeled dropline, is lowered into the water while maintaining the net's vertical position. When the desired depth is reached, the net is pulled straight up through the water column to collect the sample (Dougherty 2010).

Bongo nets consist of two cylindrical nets whose frames are yoked together and allows replicate samples to be collected concurrently (Figure A-8). The bongo nets are of various diameters and fine mesh sizes and are towed through the water at various depths to sample plankton in different parts of the water column. During each plankton tow, the bongo net is deployed to the desired depth and is then retrieved at a controlled rate so that the volume of water sampled is uniform across the range of depths. In shallow areas, sampling protocol is adjusted to prevent contact between the bongo nets and the seafloor. A collecting bucket, attached to the codend of the net, is used to contain the plankton sample.

Credit: Morgan Busby, Alaska Fisheries Science Center

Figure A-9 Bongo net

The Tucker net (Figure A-10) is a medium-sized single-warp trawl net used to capture plankton at different depths. The Tucker trawl usually consists of a series of nets that can be opened and closed sequentially without retrieving the net from the fishing depth.

Credit: AFSC 2015a

Figure A-10 Tucker trawl

Neuston nets (Figure A-11) are designed to capture members of the neuston, the collective term for the organisms that inhabit the water's surface. Neuston nets have a rectangular frame and are towed horizontally at the top of the water column, half submerged at 1-2 knots from the side of the vessel on a boom to avoid the ship's wake.

Figure A-11 Neuston net

The Multiple Opening/Closing Net and Environmental Sensing System (MOCNESS) is based on the Tucker trawl principle where a stepping motor is used to sequentially control the opening and closing of the nets

using underwater and shipboard electronics (Figure A-12). The electronics system continuously monitors the functioning of the nets, frame angle, horizontal velocity, vertical velocity, volume filtered, and selected environmental parameters, such as salinity and temperature. The AFSC utilizes the MOCNESS and the Multinet to determine the vertical distribution of larval fishes and crabs for use in transport models. Data is also used to investigate the effects of climate variability on recruitment.

Credit: AFSC 2015a

Figure A-12 MOCNESS

Seine Nets

A seine is a fishing net that generally hangs vertically in the water with its bottom edge held down by weights and its top edge buoyed by floats. AFSC uses two types of seines for research - beach seines and pole seines.

Beach seines are deployed from shore to surround all fish in a nearshore area. When setting the net, one end is fastened to the shore while the other end is set out in a wide arc and brought back to the beach. A beach seine can be deployed by hand or with the help of a small boat. When the net is set, each side is pulled in simultaneously, herding the fish toward the beach (Figure A-13). During the entire operation, the headrope with floats stays on the surface and the weighted footrope remains in contact with the bottom to prevent fish from escaping the area enclosed by the net. The beach seines used in AFSC research are 15 to 30 feet in depth and 75 to 150 feet in length, with mesh sizes of less than 1 inch.

A pole seine is a rectangular net that has a pole on either end to keep the net rigid and act as a handle for pulling the net in (Figure A-14). The net is pulled along the bottom by hand as two or more people hold the poles and walk through the water. Fish and other organisms are captured by walking the net towards shore or tilting the poles backwards and lifting the net out of the water.

Credit: Paul Olsen, NOAA Fisheries

Figure A-13 A beach seine being pulled in

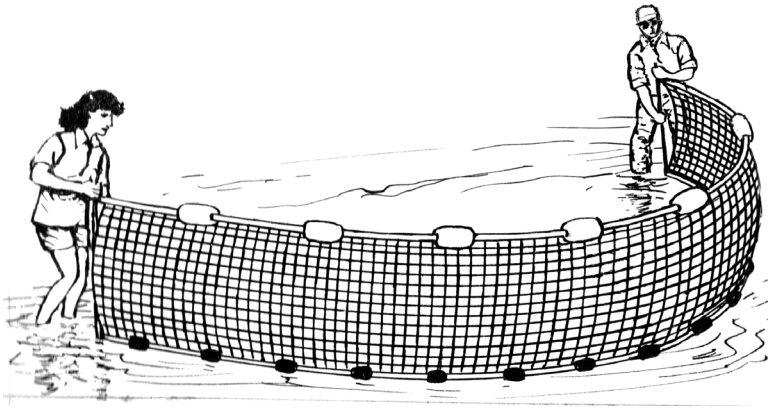


Figure A-14 Pole seine

Cast Nets

Cast nets are a light weight circular net with weights around the perimeter. The net is thrown from shore or from a vessel and falls towards the bottom, trapping any fish that are caught (FAO 2015a). The AFSC uses cast nets to survey forage fish and in educational programs.

Gillnets

Gillnets (Figure A-15) consist of vertical netting held in place by floats and weights to selectively target fish of uniform size depending on the netting size (Walden 1996). Gillnets are either anchored to the bottom ('set gillnet') or are deployed with one end attached to a vessel and is allowed to drift with the current or tides ('drift gillnet'). Gillnets are made of monofilament, multi-monofilament, or multifilament nylon constructed of single, double, or triple netting/paneling of varying mesh sizes, depending on their use and target species (Hovgård and Lassen 2000). A specific mesh size will catch a target species of a limited size range, allowing this gear type to be very selective. The AFSC uses gillnets of various mesh sizes and 35 to 150 ft in length in forage fish and salmon studies.

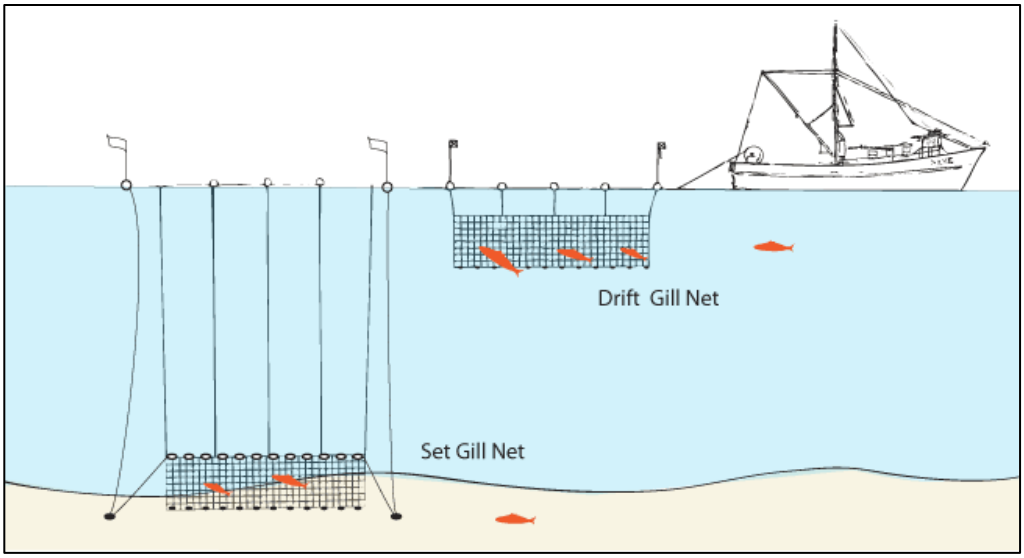


Figure A-15 Diagram of a drift and set gillnet deployment

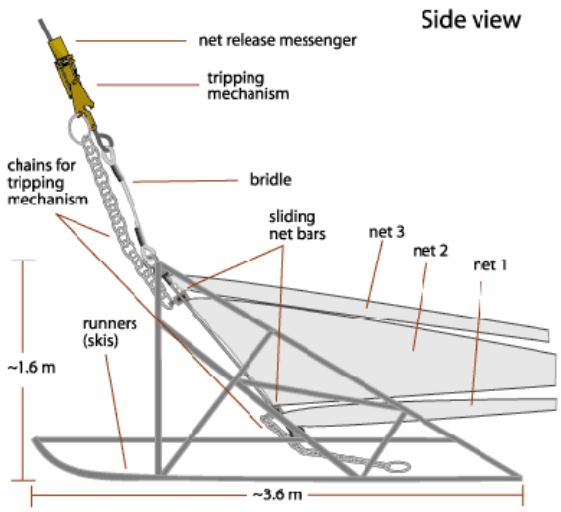
Dip Nets

A dip net (Figure A-16) is a bag net attached to a long rod that is used by hand to scoop fish or other organisms of interest from the water. Dip nets come in various sizes, the AFSC uses dip nets with a diameter range of 0.25m to 0.5m and a mesh size from 505 µm to 6300 µm.

Figure A-16 Dip net

Epibenthic tow sled

An epibenthic tow sled (Figure A-17) is an instrument that is designed to collect organisms that live on or just above bottom sediments. It consists of a fine mesh net attached to a rigid frame with runners to help it move along the substrate (it resembles a Tucker Trawl on skis). The sled is towed along the bottom at the sediment-water interface, scooping up small fish, shrimp, plankton and other organisms as it goes. The AFSC uses an epi-benthic tow sled with a 0.68 m^2 net to collect age-0 flatfish and tanner crabs in nursery areas off Kodiak Island and a 1 m^2 mouth area sled with 0.500 mm mesh in the Arctic to capture near bottom invertebrates and larval fish.



Credit: AFSC 2015a

Figure A-17 Diagram of an epibenthic tow sled

Rock Dredges

The AFSC uses a six foot wide Virginia crab style dredge fitted with a half inch nylon mesh liner (Figure A-18). This dredge type consists of a heavy metal rectangular form bearing a toothed drag bar and a mesh bag to collect specimens.

Credit: Maryland Department of Natural Resources 2016

Figure A-18 Virginia crab style dredge

Pots and Traps

Fishing pots and traps are three-dimensional structures that permit fish and other organisms to enter the enclosure but make it difficult for them to escape. Traps and pots allow commercial fishers and researchers to capture live fish and can allow them to return bycatch to the water unharmed. Traps and pots also allow some control over species and sizes of fish that are caught. The trap entrance can be regulated to control the maximum size of fish that enter. The size of the mesh in the body of the trap can regulate the minimum size that is retained. In general, the fish species caught depend on the type and characteristics of the pot or trap used. Fishing traps and pots used by AFSC include fyke nets, net pens, weirs, and pots.

A fyke net (Figure A-19) is a fish trap that consists of cylindrical or cone-shaped netting bags that are mounted on rings or other rigid structures and fixed on the bottom by anchors, ballast or stakes. Fyke traps are often outfitted with wings and/or leaders to guide fish towards the entrance of the bags. The Fyke net used by the AFSC is constructed with a length of 40 ft and a mesh size of ½ inch and is only deployed in freshwater to capture juvenile salmon.

Figure A-19 Fyke net diagram

A net pen is a three sided net with no top that is designed to hold fish alive. The net pen used by AFSC is 20 ft deep by 20 ft wide by 20 ft long.

A hoop net is a long conical trap made of multiple successive hoops, typically six or seven, and multiple nested funnels. Fish swim into each successive funnel and become trapped (FAO 2015b). The hoop net used by the AFSC is 3 ft in diameter and 8 ft in length with a mesh size of ¼ inch.

A weir is a barrier across a river that is designed to alter the movements of fish so they can be either caught more easily or counted. There are many types of designs and constructions of weirs, from temporary wood weirs to permanent concrete and metal weirs. The type of weir utilized for a particular area is dependent on the tides, bathymetry, and species being targeted. The AFSC operates the Auke Creek Weir in the Juneau area of Alaska. This weir is used for tracking salmonid migration patterns in Auke Creek.

Pots generally consist of a rigid square, circular or conical frame made of steel, wood, or plastic. Stretched between the framing members is nylon netting with one or more funnel-shaped entrance tunnels. Pots are often baited with squid and herring and thrown overboard to rest on the seafloor and are often attached by a rope to a buoy at the water's surface. If a series of pots is set, a groundline may be used to

connect the pots to each other to aid in pot deployment and retrieval. Groundlines and vertical buoy lines can pose an entanglement hazard for marine mammals (NOAA Fisheries 2014). Various pot designs set in a longline fashion are used by the AFSC for the Octopus Gear Trial and Maturity Study in order to determine a configuration that is most effective at collecting octopus and other organisms for biological collection.

A “slinky pot” is a tunnel shaped pot that may be used as long as the pot is equipped with an 18 inch biodegradable panel following regulations for authorized fishing gear specified in 50 CFR 679.2. A slink pot is described as a more efficient and sustainable way to harvest certain species such as Sablefish as compared to the traditional baited hook. Slinky pots are collapsible and lightweight mesh filled with bait, attached to a long line, and set at the bottom of the ocean to await the fish.

2. Hook-and-Line Gear

Numerous variations of fishing gear use hooks in order to catch marine organisms. Two types used by the AFSC for research are bottom longline gear and rod-and-reel gear.

Bottom Longline

Longline fishing is a technique for catching fish in which baited hooks attached to a mainline or 'groundline' are deployed from a vessel. The hooks are attached to the longline by thinner lines called 'gangions.' Longlines can be deployed on the bottom ('bottom longline', Figure A-20), or suspended in midwater ('pelagic longline'). Bottom longlines have a weighted groundline anchored on the seafloor with long buoy lines at either end to allow it to rest on the seafloor while the attached buoys float on the surface. Each end buoy has an attached mast with radar reflector and lights which help crew find the line for retrieval.

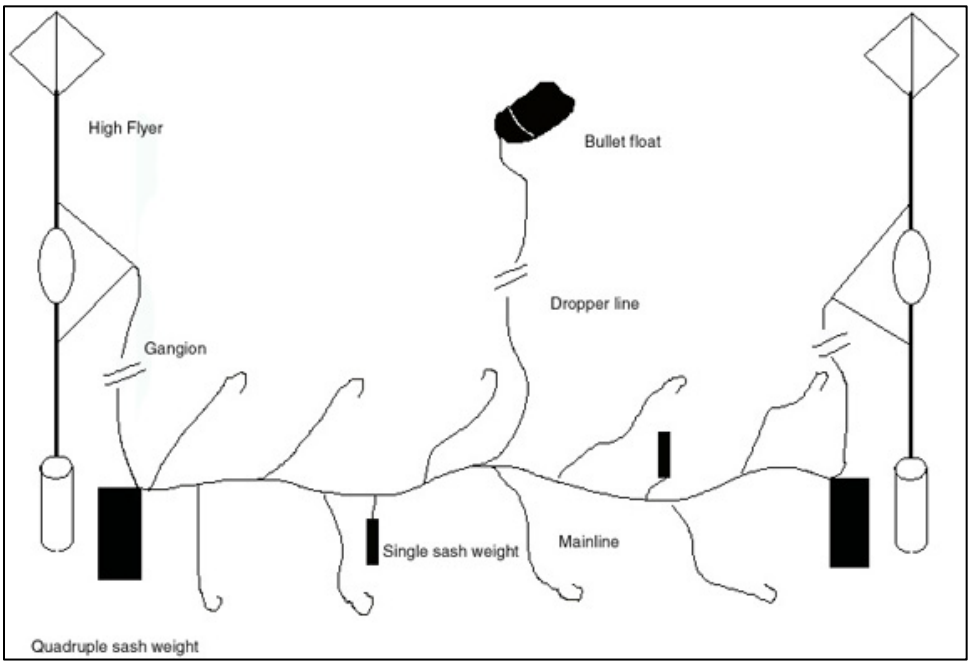


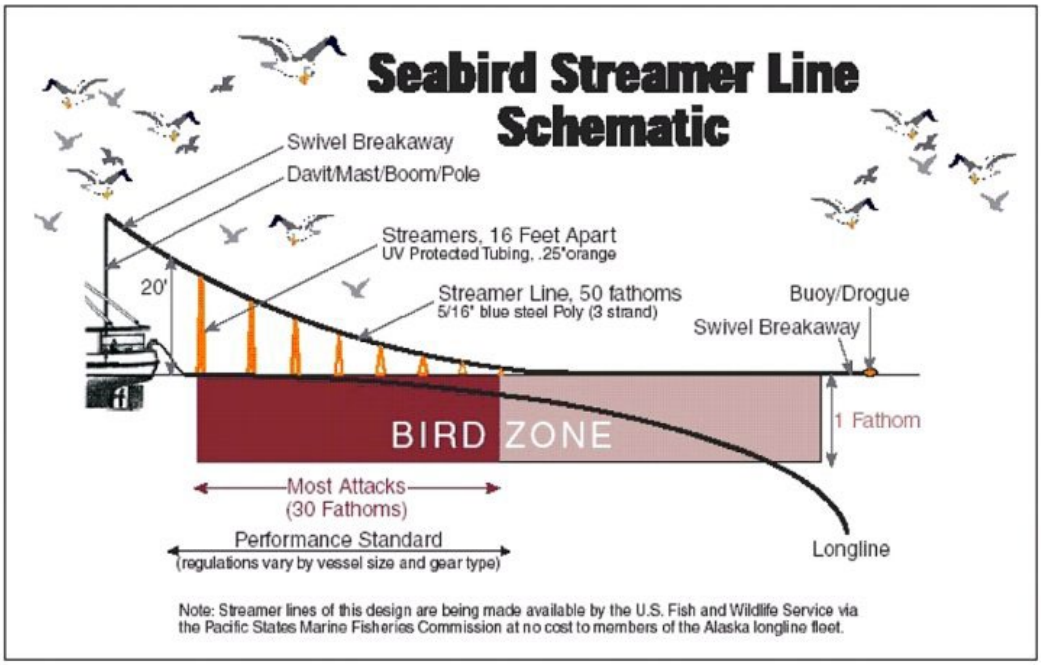
Figure A-20 General bottom longline diagram

The depth and length of the longline, the number of hooks, the length of the gangions, the duration of the set, and the distance between each gangion depend on the species targeted, the size of the vessel used, and the purpose of the fishing activity. A commercial longline set can be well over 10 miles long, have up to 20,000 baited hooks and once deployed can soak anywhere from hours to days ('soak time').

Longlines used for AFSC research purposes are 16 km in length, have 7,200 hooks, and soak for three hours, although haulback operations can take up to eight hours to complete.

Soak time is an important parameter for calculating fishing effort. For commercial fisheries, the optimal soak time maximizes the catch of target species while minimizing bycatch and minimizing damage to hooked target fish that may result from sharks or other predators. Haulback operations and soak time can be an important factor for controlling longline interactions with protected species. Marine mammals may be attracted to bait during haulback, or to fish caught on the longline hooks, and may become caught on longline hooks or entangled in the longline while attempting to feed on the catch before the longline is retrieved.

Birds may be attracted to the baited longline hooks, particularly while the longline gear is being deployed from the vessel. Birds may get caught on the hooks, or entangled in the gangions while trying to feed on the bait. Birds may also interact with longline gear as the gear is retrieved. Tori lines, consisting of paired streamers, are deployed prior to every longline set to mitigate entanglement of seabirds diving on baited hooks. The tori line gear and deployment protocols are consistent with the bird-avoidance requirements imposed on the commercial longline fleet under Magnuson-Stevens Act regulations in Alaska (Figure A-21).



Credit: Washington Sea Grant, Seattle WA

Figure A-21 Tori lines deployed for longline sets to deter seabirds

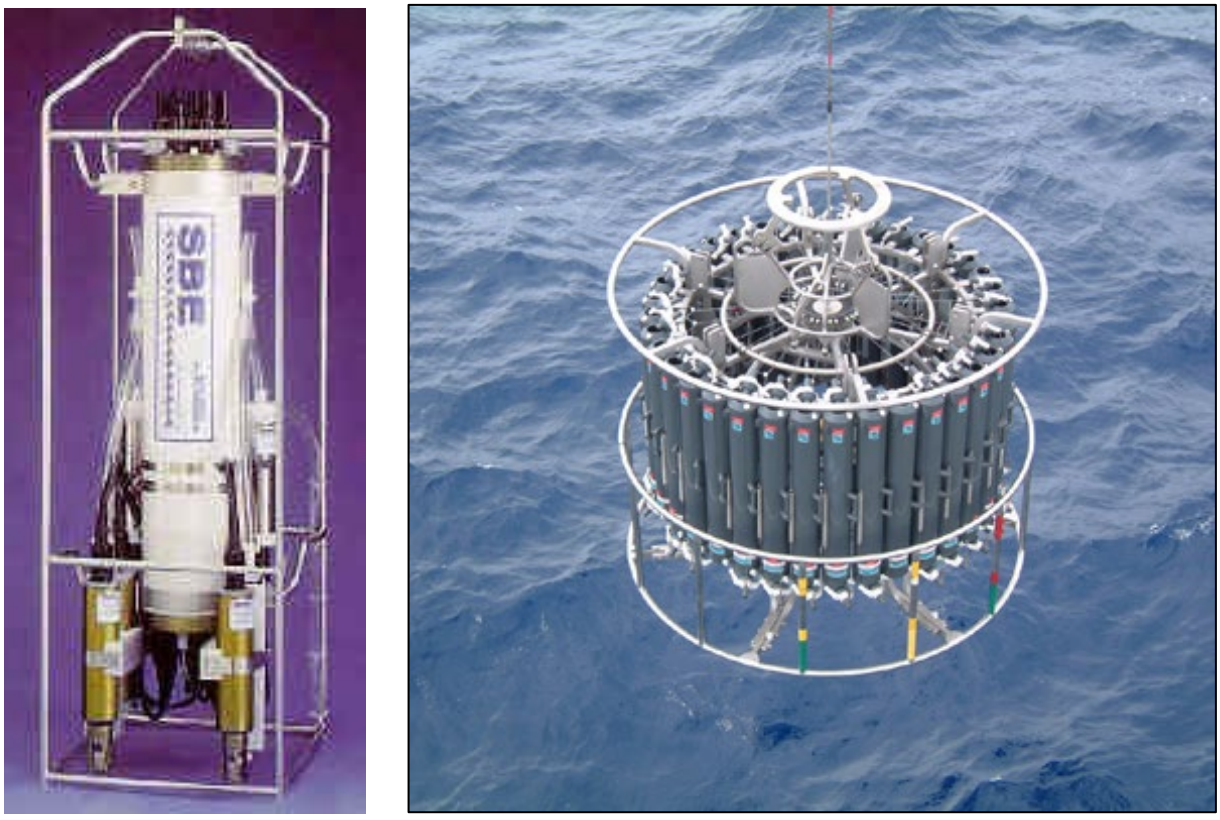
Rod and Reel

A standard fishing pole with a reel attached near the base can be used to catch fish in areas where longline, trawl or other gears are not feasible, such as complex bottom substrates, or where the survivability of the fish after capture is important. The AFSC utilizes rod and reel gear for their Juvenile Sablefish Tagging Survey. In this survey, baited jigging rigs are used in order to catch sablefish for mark and recapture analysis.

3. Oceanographic Instruments

Conductivity, Temperature, and Depth (CTD) and Water Samples

A CTD profiler measures these parameters and is the primary research tool for determining chemical and physical properties of seawater. A CTD profiler may be a fairly small device (Figure A-8 immediately above the Bongo net) or it may be deployed with a variety of other oceanographic sensors and water sampling devices (e.g., Niskin or go-flo bottles) in a large (1 to 2 meter diameter) metal rosette wheel (Figure A-22). The CTD profiler is lowered through the water column on a cable, and CTD data are collected either within the device or via a cable connecting to the ship. Water sampling devices range from a bucket dropped over the side of a small boat to Niskin bottles that are triggered at discrete depths to collect a suite of water samples throughout the water column. A CTD cast takes from minutes to hours to complete depending on water depth (WHOI 2011). The data from a suite of samples collected at different depths are often called a depth profile, and are plotted with the value of the variable of interest on the x-axis and the water depth on the y-axis. Depth profiles for different variables can be compared in order to glean information about physical, chemical, and biological processes occurring in the water column.



Credit: Sea-Bird Electronics, Bellevue WA

Figure A-22 Sea-Bird 911 and CTD deployment on a sampling rosette with Niskin bottles

Free Fall Cone Penetrometer

The Free Fall Cone Penetrometer (FFCPT) is a 52 kg probe designed to free fall through the water and penetrate 3 meters into the seabed (Figure A-23). Sound velocity is measured during deployment, and deceleration and pore pressure are measured at the end of free fall, allowing a profile of sediment types to be inferred. The FFCPT can be deployed at vessel speeds of up to 6 knots, allowing sediment sampling and sound velocity data to be collected without stopping the vessel.

Figure A-23 Free Fall Cone Penetrometer

4. Submersible Delta

The Delta (Figure A-24) is a battery powered two-person submersible with sonar, data loggers, manipulating arms, and other equipment for oceanographic and biological sample collection. The Delta is 15 1/2 feet long, weighs 4,800 lbs, and can dive to a maximum depth of 1,200 feet with a maximum speed of 1.5 knots (Delta Oceanographics 2015).

Credit: AFSC 2015b

Figure A-24 Delta submersible photo

5. Active Acoustic Sources

A wide range of active acoustic sources are used in AFSC fisheries and ecosystem research for remotely sensing bathymetric, oceanographic, and biological features of the environment. Most of these sources involve relatively high frequency, directional, and brief repeated signals tuned to provide sufficient focus on and resolution of specific objects. Table A-1 shows important characteristics of the primary acoustic devices used on NOAA research vessels and NOAA-chartered vessels conducting AFSC fisheries surveys, followed by descriptions of some of the primary general categories of sources, including all those for which acoustic takes of marine mammals are calculated in the LOA application.

Table A-1 Output characteristics for predominant AFSC acoustic sources

Abbreviations: kHz = kilohertz; dB re 1 µPa at 1 m = decibels referenced at one micro Pascal at one meter; ms = millisecond; Hz = hertz

Acoustic system	Operating frequencies	Maximum source level (dB re 1 µPa at 1 m)	Single ping duration (ms) and repetition rate (Hz)	Orientation/ Directionality	Nominal beam width (degrees)
Simrad EK60 narrow beam echosounder	18, 38, 70, 120, 200 kHz	226.7	1 ms @ 1 Hz	Downward looking	11°
Simrad ME70 narrow beam echosounder	70 kHz	226.7	1 ms @ 1 Hz	Downward looking	11°
Simrad ES60 multibeam echosounder	38 and 120 kHz	226.6	1 ms @ 1 Hz	Downward looking	7°
Reson 7111 multibeam echosounder	38, 50, 100, 180, 300 kHz	230		Downward looking	150°

Single Frequency Sonars

The Dual Frequency Identification Sonar (DIDSON) operates on a high frequency of 12 MHz that allows for high resolution for up to 30 m even in dark turbid waters. This type of sonar is used for monitoring net shapes under different fishing conditions and for fish imaging and identification.

Multibeam Echosounder and Sonar

Multibeam echosounders (Figure A-25) and sonars work by transmitting acoustic pulses into the water then measuring the time required for the pulses to reflect and return to the receiver and the angle of the reflected signal. The depth and position of the reflecting surface can be determined from this information, provided that the speed of sound in water can be accurately calculated for the entire signal path. The use of multiple acoustic 'beams' allows coverage of a greater area compared to single beam sonar. The sensor arrays for multibeam echosounders and sonars are usually mounted on the keel of the vessel and have the ability to look horizontally in the water column as well as straight down. Multibeam echosounders and sonars are used for mapping seafloor bathymetry, estimating fish biomass, characterizing fish schools, and studying fish behavior. The AFSC uses the Simrad ES60 operating at 38 and 120 kHz.

Side scan sonars (Figure A-25) are designed to produce imagery of the seafloor. Each side scan sonar consists of three parts: the towfish, the transmission cable, and the topside processing unit. The towfish is deployed near the seafloor and collects echo data for transmission to the topside processing unit which

uses the information to develop imagery of the seabed. Images contain information regarding sediment type and general roughness, and tend to show an improved view of the seafloor over hull-mounted systems due to a lower angle of incidence with the seafloor. In addition to creating higher resolution imagery, side scan sonars are used to collect data on fluorescence of colored dissolved organic matter (CDOM), chlorophyll-a and turbidity.

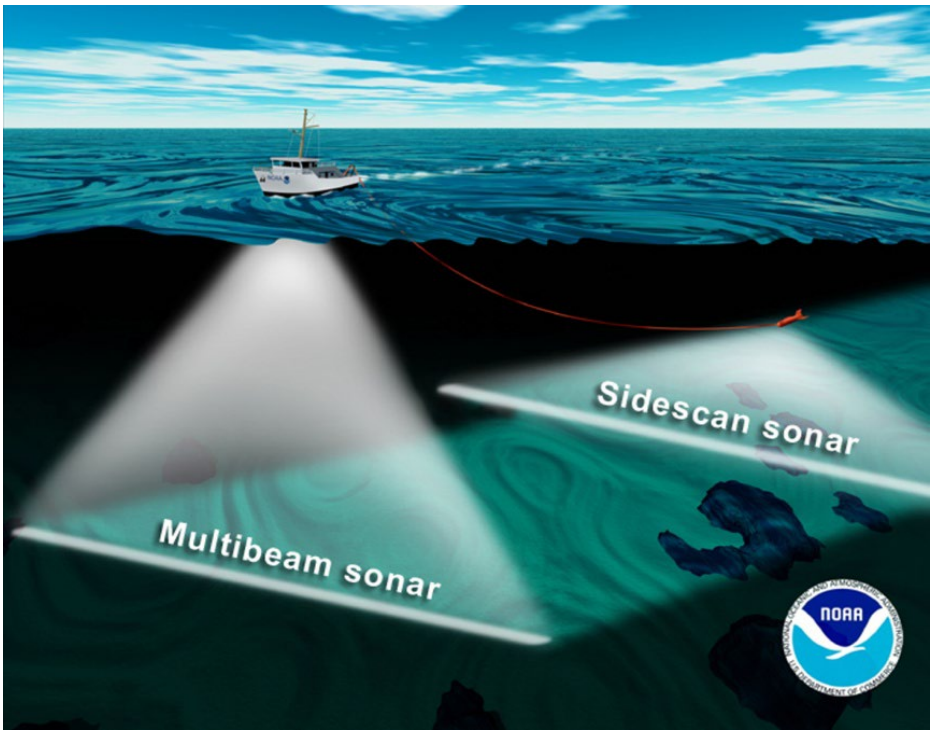


Figure A-25 Conceptual image of a multibeam echosounder and side scan sonar

Multi-Frequency Sensors

Similar to multibeam echosounders, multi-frequency split-beam sensors are deployed from NOAA survey vessels to acoustically map the distributions and estimate the abundances and biomasses of many types of fish; characterize their biotic and abiotic environments; investigate ecological linkages; and gather information about their schooling behavior, migration patterns, and avoidance reactions to the survey vessel. The use of multiple frequencies allows coverage of a broad range of marine acoustic survey activity, ranging from studies of small plankton to large fish schools in a variety of environments from shallow coastal waters to deep ocean basins. Simultaneous use of several discrete echosounder frequencies facilitates accurate estimates of the size of individual fish, and can also be used for species identification based on differences in frequency-dependent acoustic backscattering between species. The AFSC uses primarily the Simrad EK60, which is a split-beam echosounder with built-in calibration. It is specifically suited for permanent installation onboard a research vessel. The Simrad EK60s used in AFSC surveys operate in multiple frequencies simultaneously; 18, 38, 70, 120, and 200 kHz.

7. Underwater Cameras

The AFSC uses a diverse array of underwater camera housing designs in order to capture still and video footage of study areas. Some of these are attached to nets, and some have stand-alone housings that allow the camera to be deployed independently of survey fishing gear.

Underwater Cameras Attached to Fishing Gear

The Conservation Engineering surveys utilize a 20 x 9 x 4.5 inch camera and housing unit that is attached to the headrope of a research trawl. It is a complete integrated unit with internal LED light and battery. It is typically deployed on fishing gear by clipping it to the gear.

The FISHPAC survey utilizes a camera and sample collection device known as the Seabed Observation and Sampling System (SEABOSS, Figure A-26). The SEABOSS is designed to observe and collect data on sediment and physical seabed characteristics. The samples and video collected are used to groundtruth acoustic backscatter.

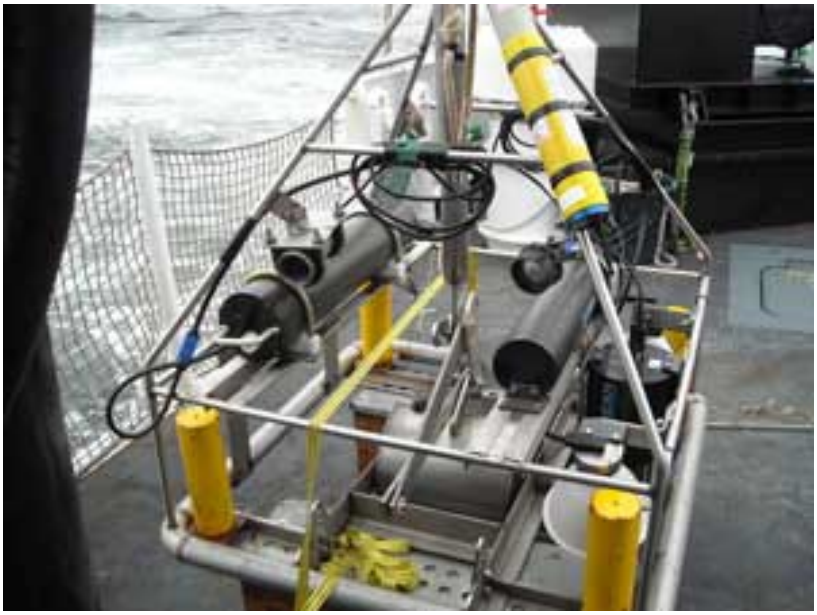


Figure A-26 SEABOSS

Underwater Cameras Deployed Independently of Fishing Gear

The Acoustic Assessment of Snakehead Bank survey used drop cameras housed in a 1 x 0.75 x 0.5 meter cage constructed from aluminum tubing. Two machine-vision cameras spaced approximately 3 cm apart in underwater housings are connected via ethernet cables to a computer also in an underwater housing within the cage.

The Rockfish Habitat Studies survey uses paired video cameras housed and mounted in a metal frame. They are deployed for approximately ~45 minutes at a depth of 45-100 m.

The Deep Sea Coral and Sponge Distribution surveys utilize a stereo camera sled with two cameras four strobe lights contained in an aluminum frame. It is designed to be drifted or towed along the seafloor at a distance of ~1 m off the seafloor. Other towed cameras include the Towed Auto-Compensating Optical System (TACOS, Figure A-27), which utilizes four to six underwater lights and a down-weight up to 25 m in front of the camera sled to stabilize sled motion (Figure A-28). The TACOS is used in the FISHPAC survey to groundtruth acoustic data.

Remotely Operated Vehicles (ROVs) and Autonomous Underwater Vehicles (AUVs) are either owned by AFSC or other NOAA entities and have the potential to be used in new techniques to survey fishes and quantify habitat.

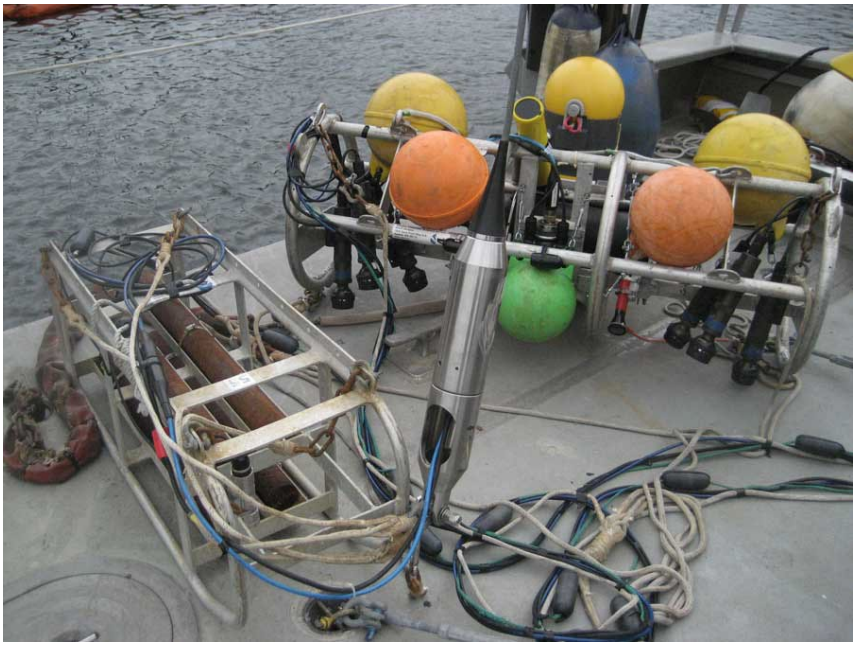


Figure A-27 TACOS video system with weighted sled

Figure A-28 TACOS video system during deployment

8. Vessels used for AFSC Survey Activities

The AFSC primarily employs one NOAA- owned and operated fisheries research vessel, the NOAA Ship *Oscar Dyson* (Figure A-29), and the Alaska Department of Fish and Game (ADFG) uses the R/V *Resolution* to conduct fisheries research on behalf of the AFSC. It also uses the NOAA Ship *Fairweather* (Figure A-30), as well as research vessels in the University National Oceanographic Laboratory (UNOLS) fleet. However, most of the vessels used for AFSC fisheries research are chartered fishing vessels. A wide range of commercial fishing vessels participate in such research, ranging from small open boats to modern trawlers and longliners measuring up to 57 m in length. The sizes of the vessels used, engine types, cruising speeds, etc. vary depending upon the location and requirements of the research for which the vessel is used. Although some vessels are chartered on a regular basis, the particular vessels used year to year depend on availability, research needs, and competition for contract services.

NOAA Ship *Oscar Dyson*

Figure A-29 NOAA Ship *Oscar Dyson*

The *Oscar Dyson* supports NOAA's mission to protect, restore and manage the use of living marine, coastal, and ocean resources through ecosystem-based management. Its primary objective is as a support platform to study and monitor Alaskan pollock and other fisheries, as well as oceanography in the Bering Sea and Gulf of Alaska. The ship also observes weather, sea state, and other environmental conditions, conducts habitat assessments, and surveys marine mammal and marine bird populations. Ship specifications are available at: http://www.moc.noaa.gov/od/

Figure A-30 NOAA Ship *Fairweather*

The *Fairweather* is a hydrographic survey ship that was originally commissioned with NOAA in 1968. The ship was deactivated in 1989 but a critical backlog of surveys for nautical charts in Alaska was a motivating factor to reactivate the ship in 2004. The ship is equipped with the latest in hydrographic survey technology – multi-beam survey systems; high-speed, high-resolution side-scan sonar; position and orientation systems, hydrographic survey launches, and an on-board data-processing server. Increased mission space and deck machinery enable *Fairweather* to be tasked with anything from buoy operations to fisheries research cruises. Ship specifications are available at: http://www.moc.noaa.gov/fa/index.html

R/V *Resolution*

Source: http://www.adfg.alaska.gov/cfregion4/dynamic/research/view/NPRB:1107_Objectives

Figure A-31 R/V *Resolution*

One of many research vessels administered by ADFG, the 27.7m R/V *Resolution* (Figure A-30) was used in the ADFG Large-mesh Trawl Survey and the ADFG Small-mesh Shrimp and Forage Fish Survey.

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Appendix B

2024 Operational Mitigation Measures and Handling Procedures
for Fisheries Research Conducted and Funded
by the Alaska Fisheries Science Center
and the International Pacific Halibut Commission
March 2024 version

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1.0 Introduction

Mandatory compliance with federal environmental and conservation mandates is required of all research conducted by NOAA or through NOAA sponsorship undertaken to support NOAA's various missions. This manual also covers surveys and research conducted by the International Pacific Halibut Commission (IPHC). In Alaska, protected species include marine mammals, sea otters, walruses, polar bears, Short-tailed Albatrosses, Steller and Spectacled Eiders, and some West Coast salmonids, green sturgeon, sea turtles and migratory birds. AFSC monitoring efforts will be focused on those protected species frequently encountered by our research surveys in Alaskan waters.

This mitigation manual is a living document and will be updated as new information is known. This manual will be referenced by the Alaska Fisheries Science Center (AFSC) scientists during research cruises and activities as part of complying with conservation laws including the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), Marine Mammal Protection Act (MMPA), National Historic Preservation Act (NHPA), Magnuson-Stevens Fishery Conservation and Management Act (MSA). To date, the AFSC has received authorization or concurrence of compliance under these authorities for: Programmatic Environmental Assessment (PEA), Biological Opinion and Incidental Take Statement for Short-tailed Albatross (USFWS), ESA listed mammals and birds (USFWS), MMPA managed mammals (USFWS), ESA listed mammals and fish (NMFS), Essential Fish Habitat (NMFS), and historical resources and artifacts (Alaska State Historic Preservation Officer, SHPO).

These procedures are the same whether the survey or study is conducted on board a NOAA vessel or chartered vessel by NOAA, IPHC, or affiliate. The described procedures are based on protocols used during previous research surveys, best practices developed for commercial fisheries using similar gear, or specified in the authorizations listed above. Mitigation measures are those taken to prevent, avoid, or minimize the encounter and potential direct interaction with a protected resource. Handling measures are those taken to free live protected species from gear or return a live animal to the sea or process a dead animal. Mitigation measures are not meant to be burdensome or detract from conducting research but are based upon best professional judgement, rules, or specifications in authorizations. These measures will focus on situations where protected species pose a risk of direct interaction with any gear or the vessel.

To ensure consistent and up-to-date information dissemination a yearly training for all Chief Scientists and vessel crew will be offered. Training programs will be conducted by the AFSC Environmental Compliance Coordinator on a regular basis and will include review of this manual and topics such as monitoring, preventing, and avoiding protected species. The training will also consist of reporting mechanisms, species identification, and procedures for handling protected species. So that all AFSC research crew members who may be assigned to monitor for the presence of marine mammals during future surveys adequately learn the mitigation measures, they will be required to attend an initial training course and refresher courses annually or as necessary. This manual is revised and updated with any new information from NMFS and USFWS as needed and is available in digital or hardcopy format for scientists to refer to during surveys.

Mitigation measures and monitoring procedures will be reviewed by the AFSC Environmental

Compliance Coordinator on a yearly basis. Debrief surveys and meetings will access the scientist's ability to execute these measures and any communication challenges between the Chief Scientists and the vessel operators. Each winter, during the debrief discussions, the AFSC Environmental Compliance Coordinator will note any professional judgment used to avoid an interaction with a protected species and will include them in future training.

2.0 Pre-Cruise Actions

Communication

Communication is the primary activity prior to the field season. External communication to stakeholders, Alaska communities, especially the native and coastal communities will be done by the AFSC Communications group. The AFSC compliance officer will add mitigation measure language to all NOAA ship project instructions, charter vessel contracts, and applications for scientific research permits. AFSC staff are responsible for communication with the USFWS and AKRO to discuss a seabird avoidance plan, polar bear and walrus interaction plan, or when survey stations are within three nautical miles from a Steller sea lion rookery.

The compliance officer will communicate with IPHC staff to ensure mitigation measure materials are consistent with those of AFSC. Entry into the NOAA Fisheries Protected Species Incidental Takes (PSIT) database will be done either by the chief scientist or the division directorate. The chief scientist must clarify whether they have entered the data into the PSIT for each direct interaction. For each entry, an email will be automatically sent to the staff of the protected resources division of the Alaska regional office. Communication with various partner organizations will follow a similar method, in that if the Chief Scientist is unable to communicate directly with the stranding network, USFWS, NMFS/OLE, or SHPO (figure 1).

A Polar Bear and Walrus interaction plan will need to be developed and discussed with UWFWS prior to any survey in the Northern Bering Sea and Arctic regions. Seabird avoidance plans are replaced by extensive seabird avoidance measures and training.

Figure 1: Basic communication tree while at sea.

Steller Sea Lion Mitigation

After random survey stations have been selected, AFSC, MML, and AKR PRD staff will review details of sites selected that are within 3 nautical miles (nm) of rookeries and haulouts. Staff will plot selected stations along with the explicit length of shore occupied by Steller sea lions at rookeries and haulouts (Lewis *et al* 2018). Staff will review any specific information about the rookeries and haulouts, and whether or not the selected station is in direct line of sight and sound to any part of the length of occupied shoreline (for example, on the other side of an island). If this review shows that disturbance at the rookeries and/or haulouts is unlikely from research activities at the selected survey station, then the station may be included, subject to the move-on rule and other mitigation measures. If this review shows that disturbance is likely:

- Within 3 nm of Steller sea lion rookeries on the list in Appendix A:

    - Research activities at that station shall be avoided between April 20 and June 30.
- During other time periods at rookeries and year-round at haulouts, vessels should not transit within 2 nm of Steller sea lion rookeries and haulouts on the list in Appendix A.

Seabird Avoidance Plan

Seabird avoidance measures is integrated in the standard operating procedures of surveys using longline gear. Seabird avoidance measures for other geartypes are included in the annual mitigation measure training.

Polar Bear and Walrus Interaction Plans

USFWS requires all surveys on land and sea in the Bering Sea (north of Nome), Chukchi Sea and Beaufort Sea to include a polar bear and walrus interaction plan. Chief scientists from each survey is required to develop plan and coordinate with USFWS to ensure compliance.

Mitigation Training

The compliance officer will develop, revise, and deliver all training to Chief Scientists and vessel operators on a yearly basis. Chief Scientists are responsible for ensuring vessel operator and crew are familiar with these mitigation strategies prior to the start of the survey.

Mitigation Kit

Prior to each survey, each vessel will obtain a mitigation kit plus a pair of range-finding binoculars. Binoculars are property of the survey team and should be inventoried with other survey equipment. Compliance Coordinator will distribute mitigation kits that include the following:

Digital (Google Drive):

- AFSC Protected Species Encounter Form (fillable PDF or comparable)
- Permits (see Table 1)
    - Electronic or hard copy of the final LOA;
    - Electronic or hard copy of the final BiOp mitigation measures and Terms and Conditions
- Mitigation Measures Operations Manual
- Monitoring log as google spreadsheet – one per survey per year (table 1)

ID guides:

- Marine Mammals of Alaska (hardcopy only)
- Key to Pinnipeds Species in Alaska Fisheries
- Seabirds
- North Pacific Right Whale
- Compliance quick view
- Entanglement flyer
- AFSC Protected Species Handling form (printed on write-in-rain paper)

Cetacean tissue sampling kit (2)

Range-finding Binoculars

Programmatic Environmental Assessment (PEA) for NEPA
NMFS LOA for MMPA
NMFS BiOp for ESA species (Section 7 consultation)
USFWS BiOp for ESA Short-tailed Albatross
USFWS Letter of Concurrence (LOC) for NMFS LOA for MMPA
USFWS LOC for ESA species except Short-tailed Albatross
LOC for Essential Fish Habitat
Salvage Permit for Seabirds other than Short-Tailed Albatross
National Historic Preservation Act – Letter of Response

Table 1: All permits, letters of authorization (LOA), letters of concurrence (LOC) or other documents to show AFSC fisheries and ecosystem research activities comply with environmental laws and regulations.

Haul_Num	PSM name	Visual Monitoring	Monitoring Done? Y/N	Sighting? Y/N	Encounter? Y/N	Notes: Detail why monitoring was not done or any challenges with monitoring
		15 minute				
		Deployment				
		Fishing (data collection)				
		Retrieval				
		15 minute				
		Deployment				
		Fishing (data collection)				
		Retrieval				
		15 minute				
		Deployment				
		Fishing (data collection)				
		Retrieval				
		15 minute				
		Deployment				
		Fishing (data collection)				
		Retrieval				

Table 2. Example of Monitoring Log.

3.0 Mitigation Measures

Mitigation measures are to be exercised during each fishery research survey. Prevention, avoidance, and other measures to minimize encounters with protected resources are outlined below. Chief Scientists must review all mitigation measures with vessel operators before the start of each survey.

Classifying Encounters with Live Protected Species

Marine Mammals	**Seabirds**	**Other ESA listed species**
Species covered by NMFS Whales Seals Sea lions		Sea turtles Salmon Green sturgeon
Species covered by UWFWS Walrus Polar bear Northern sea otter	 Short-tailed Albatross Spectacled eider Steller's eider	Migratory birds

Recording and reporting of any significant observations or direct interactions with protected species is a critical part of the compliance measures. The type(s) of records, to whom and how quickly the information must be reported depend on the type of encounter and the species. To record any encounter the AFSC Protected Species Encounter form must be used.

Significant observations are encounters with protected or endangered species as described below and must be recorded at time of occurrence then reported at the end of the survey to the environmental compliance coordinator, unless otherwise noted.

A significant observation is:

- Marine mammals (all pinnipeds including walrus, cetaceans, northern sea otter, and polar bear) entering into gear deployment area or waters within 100 yards of the vessel;
- When the Move-On Rule is employed
- Sightings of less common protected or endangered marine mammals, sea birds and turtles:
    - Cook Inlet DPS beluga whale, report sighting immediately
    - North Pacific right whale, report sighting immediately, take lots of photos
    - Blue whale,
    - Sperm whale
    - Short-tailed albatross
    - Leatherback sea turtle

  - Spectacled eider
  - Steller's eider
- Marine mammals that do not move from research site or survey station;
- Marine mammals that display unusual behavior or change behavior;
- Large groups of listed marine mammals (greater than 10 humpback whales or more than 2-3 of other species);
- Observation of Steller sea lions at rookeries or haulouts (see Appendix A) that are startled or exhibit movement behavior when vessel is operating in the area. Report immediately

Direct interactions are encounters when there is physical contact with a marine mammal or other protected species and must be recorded and reported immediately to the Division Directorate and the environmental compliance coordinator. Direct interactions include contact with the vessel, is captured by or contacts the research gear and any interactions causing injury to the animal or the animal is otherwise killed due to research activity. Report all direct interactions immediately to Division Directorate and the Alaska SeaLife Center and/or the U.S. Coast Guard if necessary.

Monitoring Responsibilities

The Protected Species Monitor (PSM), Marine Mammal Visual Monitor (for NMFS rules)/Protected Species Observer (for USFWS rules), for an AFSC-funded fisheries research survey or IPHC is the Chief Scientist. There will always be a PSM aboard all of our fisheries research surveys. The Chief Scientists can designate another person who has attended the training or has been briefed on AFSC mitigation measures to fulfill the duties of the PSM. It is the responsibility of the Chief Scientist to ensure the vessel operator and crew are trained on the mitigation measures. The vessel operator may be the captain of a NOAA vessel, the designated ship captain of a charter vessel, or the designated small boat operator.

Chief Scientists or Protected Species Monitor Duties (all research activities):

- Communicate mitigation measures and handling procedures to vessel operator and are included in any contracts with chartered vessels.
- Collaborate with Vessel Operator and other personnel to employ mitigation measures.
- Serve as PSM or designate other personnel to carry out monitoring procedures as Protected Species Monitor.
- Monitor from safe area where best possible view of surrounding waters and gear deployment/retrieval can be maintained.
- Record in monitoring log – at each haul/station.
- Monitor within 2 nm at least 15 minutes before the survey station or study site, if a protected species is in the area, then employ one of the three scenarios of the Move-On Rule (see below).
- Monitor during all research activities from Gear deployment to Gear Retrieval
- Ensure vessel operator is monitoring during transit between stations
- Prevent monitoring fatigue by avoiding continuous monitoring for over 4 hours.

- Must attend annual spring training on mitigation measures provided by the AFSC Environmental Compliance Coordinator and protected species ID provided by the AFSC Fisheries Monitoring and Analysis division, also known as the observer program.
- ID animals as unknown where appropriate if significant uncertainty.
- When transiting between sampling stations in designated critical habitats for Steller sea lion, North Pacific right whale, or Cook Inlet beluga whale and when conducting acoustic surveys in these critical habitat areas, vessels must slow to an effective speed of 10 knots any time the marine mammals are observed within an estimated distance of 0.5 nautical miles.
- When transiting through passes in the Aleutian Islands and through the Bering Strait, the Chief Scientist and vessel operator will be extra vigilant in maintaining a watch and will assign additional watch standers if possible due to heavy use of these passes by marine mammals, including North Pacific right whale.
- During nighttime or limited visibility gear deployments, the research area around the ship will be searched for marine mammals or congregations of birds before gear deployment.
- Use WhaleAlert app to check for marine mammal sightings when in Southeast Alaska.
- Record and report all encounters to divisional directorate
- Participate in Debriefing survey and discussions to evaluate mitigation measures.
-

Vessel Operator responsibilities:

- Avoid ship strikes while transiting and during research activities (see below)
- Minimize vessel and gear interactions with protected species.
- Handling of any animals that come aboard the vessel.
- Coordinate with Chief Scientist to ensure understanding of mitigation measures.
- Serve as protected species monitor when Chief Scientist or other PSM is not available.
- Report any interactions with protected species to Chief Scientist.

Prevention and Avoidance

Transiting: Preventing Ship Strikes

The following must be conducted to avoid ship strikes:

Vessel Operator

- When a marine mammal or protected species is seen: slow down, alter course, stop, reverse course or use professional judgment to avoid the striking animal.
- Remain at least 100 yards from marine mammals or 500 yds from North Pacific right whales.

- Whales should not be encircled or trapped between boats, or boats and shore.
- If approached by a whale, put the engine in neutral as sea conditions allow and allow the whale to pass.
- Tow speed during surveys and transit speed between survey stations are kept slow (specific speeds are listed in Table 1) to minimize the risk of vessel strikes. AFSC and AFSC-supported research vessel speeds during trawling or deploying sampling gear (other than acoustic equipment) will be less than 5 knots. IPHC vessel speeds will be less than 4 knots when research vessels are actively setting gear, and less than 2 knots when hauling gear.
- When transiting between sampling stations in designated critical habitats for Steller sea lion, North Pacific Right whale, or Cook Inlet beluga whale and when conducting acoustic surveys in these critical habitat areas, vessels must slow to an effective speed of 10 knots any time the marine mammals are observed within an estimated distance of 0.5 nautical miles.
- When transiting through passes in the Aleutian Islands and through the Bering Strait, the PSM and vessel captain will be extra vigilant in maintaining a watch and will assign additional watch standers if possible due to heavy use of these passes by marine mammals, including North Pacific right whale.
- Tow durations will be kept short, when possible, to minimize interactions with marine mammals.
- On top of mitigation measures vessels will follow basic ship strike prevention methods when not conducting research activities.
- For night-time research operations, the Chief Scientist and vessel operator will be extra vigilant in maintaining a watch, assign additional watch standers, listen for blows, watch for large seabird rafts and/or delay operations in areas of likely marine mammal or eider occurrence. Rafting seabirds in areas of Northern Bering Sea and any eider critical habitat are more likely to occur from August – April and strikes more likely in areas where there is significant overlap between seabirds and fishing vessels.
- When deploying gear at night, forward areas of the ship can remain darkened for navigational purposes but visibility amidships and aft must be at least 46 m (50 yards) around the vessel, usually accomplished with vessel lights. If red lighting is used, those lights should be limited to interior spaces. Windows should be shaded to the extent practicable when indoor spaces must be lit at night.
- Night time operations may also include transit between stations, jog or run patterns to maintain position and sea friendliness, drift or anchor, vessel operator is to be vigilant in maintaining a watch for protected species.

Additional Mitigation Measures for Vessels:

- Travel at less than 5 kts when within 274 m (300 yards) of a whale;

- Avoid changes in direction and speed within 274 m of a whale, unless doing so is necessary for maritime safety;
- Not position vessel(s) in the path of a whale, and will not cut in front of a whale in a manner or at a distance that causes the whale to change direction of travel or behavior (including breathing/surfacing pattern);
- Shift into neutral and remain in neutral when marine mammals are within 25 m (82 ft) of their vessel;
- Reduce vessel speed to 10 kts or less when weather conditions reduce visibility to 1.6 km (1 mile) or less.
- Follow the Alaska Humpback Whale Approach Regulations when vessels are transiting to and from research stations
- If a whale's course and speed are such that it will likely cross in front of a vessel that is underway, or approach within 91 m (100 yards) of the vessel, and if maritime conditions safely allow, the engine will be put in neutral and the whale will be allowed to pass beyond the vessel, except that vessels will remain 460 m (500 yards) from North Pacific right whales;
- Vessels will not allow research gear lines to remain in the water unless both ends are under tension and affixed to vessels or gear.

Transit Responsibilities onboard OMAO Platforms:

(Note: Language in this section is an excerpt from NMFS Leadership, Devaney Memo 2014)

When a NOAA program (AFSC) makes use of an OMAO platform (ship, boat, aircraft, or other conveyance), the NOAA program undertaking the mission (the "mission office") will be responsible for determining what steps are required for the proposed cruise to bring NOAA into compliance with all applicable federal environmental laws, including the NOAA statutes listed above. These steps may include, but are not limited to, securing permits or authorizations, or completing formal or informal consultations.

The mission office will perform all necessary identified compliance steps, with input provided by OMAO on any transiting, navigation, or other platform operations required to support or conduct the mission in question.

Where possible (and in accordance with the application provisions of the applicable statutes), permits, authorizations, and/or consultations will be jointly assigned to the appropriate mission office staffer (often, the Chief Scientist) and to the OMAO Command, who is ultimately responsible for complying with permits/authorizations/consultations that govern actions taken on the platform. Where joint assignment is not possible, all permits, authorizations, and/or consultations will be physically delivered to the Command and this transmittal will be acknowledged by Command signature.

The AFSC will discuss the permitting, authorization, and/or consultation process with OMAO:

- In the ship time request;
- In the aircraft support request;
- ln the Project Instructions; and
- As needed throughout the project implementation.

OMAO retains the sole responsibility for complying with all environmental statutes for those transit operations that are not connected to a mission requirement from another Line Office.

Species Specific Regulations

Humpback Approach Regulations

Vessels engaged in research activities shall adhere to the Alaska Humpback Whale Approach Regulations at all times (see 50 CFR §§ 216.18, 223.214, and 224.103(b)). These regulations require that all vessels:

- Not approach within 100 yards of a humpback whale, or cause a vessel or other object to approach within 100 yards of a humpback whale,
- Not intercept or place the vessel in the path of oncoming humpback whales causing them to surface within 100 yards of the vessel,
- Not disrupt the normal behavior or prior activity of a whale, and
- Operate all vessels at a slow, safe speed when near a humpback whale (safe speed is defined in regulation (see 33 CFR § 83.06)).
- Do not approach within 1 km of locations where Marine Mammals are aggregated including pinniped rookeries and haulouts.

Right Whale Approach Regulations

Vessels engaged in research activities shall adhere to the special prohibitions for endangered marine mammals at all times (50 CFR § 224.103(c)).

- *Prohibitions.* It is unlawful for any person subject to the jurisdiction of the United States to commit, attempt to commit, to solicit another to commit, or cause to be committed any of the following acts:
  - Approach (including by interception) within 500 yards (460 m) of a right whale by vessel, aircraft, or any other means;
- *Right whale avoidance measures.* The following avoidance measures must be taken if within 500 yards (460 m) of a right whale:
  - If underway, a vessel must steer a course away from the right whale and immediately leave the area at a slow safe speed.

Steller Sea Lions

When east of 144 degrees longitude, do not approach within 1 km of Steller sea lion rookeries and haulouts. If Steller sea lion disturbance behavior is observed at terrestrial locations other than haulouts or rookeries listed in Appendix A during research activities, the research vessel will move farther offshore. This is particularly important for haulouts and rookeries in the

Aleutian Islands where the western DPS decline is currently the greatest and the animals there may be more easily disturbed than animals in other locations in Alaska where they may have habituated to terrestrial disturbance. Surveys west of 144 degrees longitude will avoid haulouts and major rookeries by 20 nm.

Seabirds: Short-tailed Albatross, Steller eiders, Spectacled eiders

Vessel Strike Prevention

For migrating eiders, vessel strikes occur mainly due to impaired visibility and vessel lighting (see nighttime operations). The risk to spectacled eiders stems from collisions with vessels that intersect their flight path, especially at night and during inclement weather. Collisions involving ships tend to occur around areas with the greatest commercial ship traffic. These areas can be shipping lanes, marinas, inlets and well-used channels. Research vessels may cause behavioral changes during critical life stages such as molting and wintering and possibly impact eider habitat through discharge of pollutants. Always avoid areas with congregations or rafts of spectacled eiders.

Concern for eider-vessel collision is particularly high between August and November. The timing coincides with decreasing daylight and increasing inclement weather. These factors increase the likelihood that eiders may become disoriented and colliding into structures in their flight path. When in the areas of eider habitat (see Appendix B) sunrise deck monitoring is advised to identify any overnight collisions with ESA birds.

Longline

Tori lines must be used to avoid interactions with the endangered short-tailed albatross and other seabirds. No discharge of offal before or during setting of gear. Discharge processing offal away from gear retrieval. If two adult, subadult, or juvenile short-tailed albatross are found dead or wounded in a rolling two-year period (to be defined as any two consecutive years within the five-year period covered by this consultation), or if more than three short-tailed albatrosses are found dead or wounded during the next five years as a result of the AFSC's and/or the IPHC's research activities, AFSC must contact USFWS office immediately to reinitiate formal consultation.

Project activities that are likely to cause additional take should cease during this review period because the exemption provided under section 7(o)(2) would lapse and any additional take would not be authorized from the section 9 prohibitions.

Nighttime Operations

Nighttime operations should use the minimum amount of light necessary to maintain a safe work environment. During nighttime transit or while anchored, especially in the Northern Bering Sea or near seabird colonies, keep unnecessary lights off, minimize the use of sodium lighting or other high-wattage light sources, point lights inboard or downward to the fullest extent possible, and cover all portholes to avoid seabirds colliding with the vessel. PSM should be vigilant in spotting any congregations or flocks of eiders. When necessary, the Chief Scientist and vessel operator will use best professional judgement as to whether the research vessel should delay

operations or *move on* to avoid large rafts of seabirds or locations where there are considerable fishing vessels as well as seabirds. Special vigilance should be taken during seasons of higher seabird occurrence, August through April, or in locations where there is significant overlap between seabirds and fishing vessels. If red lighting is used, those lights should be limited to interior spaces. Windows should be shaded to the extent practicable when indoor spaces must be lit at night. When in the areas of eider habitat (see Appendix B) sunrise deck monitoring is advised to identify any overnight collisions with ESA birds.

Vessel Speed Restrictions in Eider Critical Habitat

When transiting or conducting research in eider critical habitat (Appendix B) or when eiders are present, reduce vessel speeds to 8 knots or less to avoid interactions.

Sea Otters

For all vessel-based activities, vessel operators must take every precaution to avoid harassment of sea otters when a vessel is operating near these animals.

- Vessels will not approach within 100 meters (328 feet) of individual sea otters.
- Vessels must remain at least 500 m from rafts of sea otters (groups of 10 or more sea otters) and 200 m from female-pup pairs unless safety is a factor.
- Vessels must reduce speed and maintain a distance of 100 m (328 ft) from all sea otters unless safety is a factor.
- Vessels must not be operated in such a way as to separate individual sea otters from a group of sea otters.
- When weather conditions require, such as when visibility drops, vessels must adjust speed accordingly to avoid the likelihood of injury to sea otters.
- Vessels in transit and support vessels must use established navigation channels or commonly recognized vessel traffic corridors, and they must avoid alongshore travel in shallow water (<20 m) whenever practicable.
- Vessel operators must be provided written guidance for avoiding collisions and minimizing disturbances to sea otters.

Walrus

Any surveys that will occur in the Northern Bering Sea north of Nome, the Chukchi and/or Beaufort Seas, must work with USFWS on a Walrus and/or Polar Bear Interaction Plan during the planning of the survey.

Walruses that are swimming or hauled out on land or ice are sensitive to boats. Your vessel may not be the only one that day that has interacted with a particular group of walruses - please be aware that increasing levels of disturbance may occur with each successive interaction. Vessels traveling in a predictable manner appear to be less disturbing to swimming walruses. Avoid excessive speed or sudden changes in speed or direction when approaching or departing walrus haulout areas.

Walruses in the water can be disturbed by underwater sounds produced by a vessel's engines and propellers. Cautiously move away from the animals if you observe any of the following behaviors:

- Rapid changes in direction or swimming speed
- Erratic swimming patterns
- Grouping up and "head bobbing" to investigate the source of the disturbance
- Escape tactics such as prolonged diving, underwater exhalation, underwater course changes, or rapid swimming at the surface
- Females attempting to shield a calf with her body or by her movements

Marine motor vessels should maintain a separation buffer from walruses hauled out on land or ice to avoid disturbance. Mariners should assume that known walrus haulouts will be occupied.

- Vessels less than 50 feet in length should remain **at least 0.5 nautical miles** away from a walrus haulout.
- Vessels 50 feet or more but less than 100 feet in length should remain **at least 1 nautical mile** away from a walrus haulout.
- Vessels 100 feet or more in length should remain **at least 3 nautical miles** away from a walrus haulout.
- All vessels should refrain from anchoring or conducting tendering or fishing operations **within 3 nautical miles** of a walrus haulout.

Sound carries a long way across the water and often reverberates off cliffs and bluffs adjacent to walrus haulouts amplifying the level of noise. Reduce noise levels near haulouts. Avoid sudden changes in engine noise, using loud speakers, loud deck equipment or other operations that produce noise when in the vicinity of walrus haulouts.

Vessel operators should take every precaution to avoid harassment of concentrations of feeding or swimming walruses. Vessels should reduce speed and maintain a minimum 0.5 - nautical mile exclusion zone around feeding walruses. Vessels may not be operated in such a way as to separate members of a group of walruses from other members of the group. When weather conditions require, such as when visibility drops, vessels should adjust speed accordingly to avoid the likelihood of injury to walruses. Harassment or pursuit of marine mammals is prohibited by law. Never attempt to herd, chase, or separate groups of walruses.

Bristol Bay specifics: There are five regularly used walrus haulouts in Bristol Bay, located at Round Island and Hagemeister Islands and Capes Peirce, Newenham, and Seniavin. During the months of May through December, walruses may be encountered in the water and resting on land in these areas. Round Island is part of the State of Alaska Walrus Islands State Game Sanctuary and has developed regulations specific to state waters in that area. The guidelines listed here do not supersede or amend the regulations adopted by the State of Alaska for Round Island and mariners need to make themselves aware of those regulations when in the vicinity of the Sanctuary. Mariners should note that state waters (0 – 3 nautical miles) around Round Island,

within the Walrus Islands State Game Sanctuary are closed to all access without prior authorization under state regulations.

Polar Bears

Polar bears use sea ice, marine waters and terrestrial areas in northern and northwestern Alaska for resting, feeding, denning, and seasonal movements. They are most likely to be encountered within 25 miles of the coastline, especially along barrier islands during July-October. Polar bears may also be encountered farther inland, especially females during the denning period (November-April). Be aware that polar bears also occur within human settlements such as villages, camps, and work areas.

Polar bears react differently to human presence, depending on a variety of biological and environmental factors, as well as their previous experience with humans. Hungry (skinny) bears can be particularly dangerous. The general strategy for minimizing human-bear conflicts is to: **1) be prepared; 2) avoid encounters; and 3) know how to respond if an encounter occurs.**

Unusual sightings or questions/concerns can be referred to Polar Bear Program staff at the Marine Mammals Management Office at (800) 362-5148; or to the Fairbanks Fish & Wildlife Conservation Office at (907) 456-0499.

When traveling on land or sea ice:

- Be prepared. Have a human-bear safety plan that includes information on how to avoid and respond to bear encounters. Carry deterrents, and practice/know how to use them.
- Avoid surprise encounters. Travel in groups, make noise, and be vigilant - especially on barrier islands, in river drainages, along bluff habitat or ice leads/polynyas, near whale or other marine mammal carcasses, or in the vicinity of fresh tracks.
- Minimize attractants. Avoid carrying strongly scented attractants such as meat or fish while away from camp, or place them in air-tight containers to minimize odor transmission.
- Avoid disturbing denning bears. Between November and April, special care is needed to avoid disturbance of denning bears. If activities are to take place during that time period, MMM should be contacted to determine if any additional mitigation is required. In general, activities are not permitted within one mile of known den sites.

When operating watercraft:

Be especially vigilant for swimming bears. If a swimming bear(s) is encountered, allow it to continue unhindered. Never approach, herd, chase, or attempt to lure swimming bear(s). Reduce speed when visibility is low and avoid sudden changes in travel direction

Monitoring for All Gear Types

Monitoring is a key mitigation measure. Monitoring for and preventing interactions with protected species is already a standard part of conducting AFSC fisheries research activities. Gear types such as bottom trawl, hook and line, surface trawls, mid-water trawls, and other types

of gear require monitoring for marine mammals prior to and during gear deployment and retrieval. If at any time the protected species monitor is unable to monitor for protected species it must be recorded in the monitoring log.

"Move On" Rule

All vessels shall use the "Move On" Rule during all research or collection activities to minimize the risk of interaction with listed marine mammals and other vulnerable protected species. If a protected species is encountered during a research activity when gear is deployed, then the vessel shall maintain course, slow down, or take other actions to avoid direct contact of the animal with the vessel or gear.

The "Move On" Rule is defined as the following: When approaching a survey station begin active monitoring for marine mammals or other protected species at 2 nm for at least 15 minutes from the survey station, depending upon the sea state and weather. If there is a marine mammal or other protected species at the survey station then one of three scenarios may occur:

1. Wait to Clear: If marine mammals or protected species are observed at or near the station location and the area clears within 15 minutes of arriving to station (30 minutes total) and the Chief Scientist and vessel operator determine no risk to the animal will occur, then research activities will continue. Record and Report as Significant Observation

2. Move Station: If marine mammals or protected species are observed at or near the station location and the area does not clear after 15 minutes of observation (30 minutes total) and the Chief Scientist and vessel operator determine there is a risk to the animal if research activities proceeded, then the vessel must move to another station or modify station location or abandon station. Record and Report as Significant Observation

3. Conduct Work: If marine mammals or protected species are observed at the station location and after 15 minutes have not moved, but the vessel master determines, using professional judgement, that they can set the research equipment and not cause a direct interaction with the animals. Record and Report as Significant Observation

An example of allowable conditions when a vessel might not necessarily need to move could be when marine mammals are feeding or residing more than 0.25 nm (500 m) from the vessel and not making directed movements toward the vessel. The vessel would move when animals seem to be approaching the vessel or if new animals arrive and are less than 500 m from the vessel. The goal will be to maintain prescribed avoidance distances between the vessel and the animals. The efficacy of the "move-on" rule is limited during night time or other periods of limited visibility, although operational lighting from the vessel illuminates the water in the immediate vicinity of the vessel during gear setting and retrieval. In these cases, it is the judgment of the Chief Scientist as based on experience and in consultation with vessel operator to exercise due diligence and to decide on appropriate course of action to avoid unintentional interactions.

Mitigation Measures Specific to Gear Type

Trawl

In addition to the "Move On" Rule methods above, many vessels will inspect the tow path before

deploying the trawl gear, adding another 15 minutes of observation time and gear preparation prior to deployment.

Once the trawl net is in the water, the Chief Scientists, vessel operator, or other designated personnel continue to monitor the waters around the vessel and maintain a lookout for marine mammals as environmental conditions allow (visibility can be limited by fog, rain, or night, but visibility of at least 50 yds around the vessel will be required for operations). If marine mammals are sighted before the gear is fully retrieved, the most appropriate response to avoid incidental take is determined by the professional judgment of Chief Scientist and vessel operator. These judgments take into consideration the species, numbers, and behavior of the animals, the status of the trawl net operation (net opening, depth, and distance from the stern), the time it would take to retrieve the net, and safety considerations for changing speed or course. During haul-back operations, there is the potential for entanglement of marine mammals as the net is retrieved, especially when the trawl doors have been retrieved and the net is near the surface and no longer under tension. If a marine mammal is sighted during haul-back, the risk of entanglement may be reduced if the trawling continues and the haul-back is delayed until after the marine mammal has lost interest in the gear or left the area. Other mitigative actions might be to maintain the course, retrieve the gear as soon as possible, slow down, stop, or in extreme situations, change course.

The appropriate course of action to minimize the risk of incidental take of protected species is determined by the professional judgment of the Chief Scientist and vessel operator based on all situation variables, even if the choices compromise the value of the data collected at the station.
Additional mitigation measures on surveys using trawl gear:

- No offal discards immediately prior to or during the trawling at a station, and
- Minimize trawling at night when possible.
- Surface trawl nets must use acoustic deterrent devices.
- Third wires will be limited to use on mid-water trawls conducted during summer and winter acoustic surveys that target groundfish such as walleye pollock.

Longline

Seabirds and Whale Depredation

The AFSC Longline Survey uses bottom longline gear with two 8 kilometer (km) long sets per day. The IPHC survey uses shorter longlines up to 3 nm (6.1 km) and usually deploys three longlines per day. Tori lines must be used to avoid interactions with the endangered short-tailed albatross and other seabirds. A crewman must ensure that the streamer lines meet performance standards and are working properly, and the PSM is present during the set to ensure protocols are being followed.

Longline gear is set at predetermined stations if no listed species are present. Gear must be set at a slow speed to ensure that the line sinks quickly, reducing the potential for entanglements. Seven-pound (lb.) lead balls or equivalent must be used to increase the sink rate and ensure the groundline reaches the seafloor. The gear is allowed to soak for a minimum of three hours for the AFSC survey and for a minimum of five hours for the IPHC survey before haul-back begins. Due to the length of the mainline and numbers of hooks involved, it takes up to three to eight hours to complete the haul- back. If whales are present at haul-back that are not depredating:

- AFSC Longline Survey vessel should continue retrieving the gear as quickly as possible in order to minimize interactions.

- IPHC may drop or leave gear to then go to retrieve another line to give the chance for the whales to leave the area near the first line.

The strategies differ because of the length and time to set and retrieve the single AFSC longline and the shorter and greater number of longlines used by the IPHC survey. Both approaches seek to minimize the exposure time of the gear to whale depredation. Allow the line to sink back down for a later retrieval is impractical as whales can wait in the area for days and fish caught on the line can still be eaten by the whales or other marine organisms. Furthermore, since the two AFSC longlines are usually laid end-to-end, dropping one set and retrieving the other set would not deter the whales because the spatial separation between sets is small enough that the whales could easily swim the distance between the two sets.

In contrast, the IPHC usually deploys three 3 nm longlines per day, in different areas, so the spatial separation between the deployed longlines means that dropping one where whales are present to retrieve another line will allow the whales time to leave the first line. If whales follow the vessels between survey stations, the survey pattern may be altered to increase the distance between stations as a means to dissuade the animals from this behavior and to avoid continued interactions. In general, the IPHC only infrequently encounters sperm whale depredation while depredation is more common for the AFSC survey in southeastern Alaska where catch rates may be reduced by over 12% when whales are present. Overall, depredation is infrequent during IPHC setline surveys, although it is more common along the Eastern Bering Sea slope than in southeastern Alaska.

- Because some species of whales (including sperm whales) have learned the sounds associated with longline operations and sometimes appear as the gear is being retrieved, several strategies are used to minimize interactions. AFSC and IPHC longline protocols specifically prohibit chumming (i.e., releasing additional bait to attract target species to the gear) before or during the longline setting operations. However, longline surveys are conducted on contracted commercial fishing catcher/processor vessels and fish are processed as the longline is retrieved.

- On the AFSC survey vessel, catch is processed aboard the vessel, and offal is macerated and discharged off the side opposite of gear retrieval. This minimizes the attraction to marine mammals and keeps seabirds away from the gear being retrieved.

- On IPHC survey vessels, bait and undesirable fish are immediately returned to the sea. Due to the small vessels and amount of catch, it is impossible to retain the catch and discard it at another time. Low documented take rates indicate that the current protocols used by both the AFSC and IPHC surveys to discharge offal, used bait, and discards are conservative processes that reduce the rate of interaction with marine mammals.

- Aboard AFSC longline surveys all halibut are released at the hook and not brought on board. During IPHC surveys it is assumed that halibut would be brought on board for weighing and measuring. As is done with offal, the surveyed, living halibut are released

on the opposite side of the ship to avoid additional interactions with any marine mammals that might have been attracted to the long line.

Gillnet

If no marine mammals are present, the gear is set and monitored continuously during the soak. If a marine mammal is sighted within 100 yds during the soak and appears to be at risk of interaction with the gear, then the gear is pulled immediately in order to minimize the time the net is in the water and exposed to nearby marine mammals. Acoustic pingers are always used to reduce the chance of encounters. Small mesh gillnets are used in AFSC surveys, which may further reduce interactions with marine mammals.

Biological Oceanography

The AFSC deploys a wide variety of gear to sample the marine environment during all of their research cruises, including but not limited to plankton nets, oceanographic sampling devices, video cameras, high-frequency active acoustics, AUVs, ROVs, and a variety of less commonly used small nets. It is not anticipated that these types of gear or equipment would interact with protected species, or are used rarely, and are therefore not subject to specific mitigation measures. However, vessel operator and Chief Scientist or designated Protected Species Monitor may use their professional judgment and discretion for any unusual circumstances that may arise at a sampling site to avoid any potential risks to protected species during deployment of any research equipment.

4.0 Handling Procedures: Marine Mammals

Marine Mammals including ESA-listed marine mammals that are captured may be alive, seriously injured, or dead. The primary directive for handling incidentally captured marine mammals is to maintain the safety of the crew and vessel. It is up to the professional judgement of the vessel crew to determine the best procedure to safely free a live animal from the gear or return a live animal to the sea. Scientific crew should never be on deck or near a live marine mammal that has been captured. If an animal is one that MML has requested biological samples, it is up to the Chief Scientist and Vessel Operator to determine the safety of taking biological samples of the dead animal. Note: No samples are to be taken from any ESA-listed species (walrus, Stellar Sea Lion, many whale species). AFSC will collect biological samples in accordance with section 109(h) of the MMPA for live/dead marine mammals (non-listed), and via regulations 223.206 and 222. 310 for live/dead threatened and endangered turtles under the ESA, or under a directed scientific research and enhancement permit. Any marine mammal biological samples should be sent to Katie Luxa, Katie.luxa@noaa.gov, 206-526-6316, at AFSC 7600 Sand Point Way NE, Seattle WA 98115.

Before the cruise begins, the Chief Scientist will provide this protocol to the vessel operator, and they will discuss procedures for handling live and dead marine mammals before the cruise begins. Marine mammal biological samples will be used to improve stock assessments, vital rates, and foraging behaviors. Data collection have been developed to be responsive to all relevant permits and legislation (e.g., MMPA, ESA, MSA). Handling procedures and a pathogen exposure control plan have been developed between AFSC fishery research personnel and the AFSC safety and environmental compliance officer. It is the Chief Scientist's responsibility to document these interactions and communicate with appropriate authorities (see Documentation

and Reporting).

Pathogen Exposure Control Plan for taking biological samples

Although the risk of transmission of any diseases from marine mammals to humans is low, we recommend the following protocols to further minimize potential exposure. It is up to the Chief Scientist and Vessel Operator to determine the safety of the field conditions for collecting any biological samples. These procedures must be followed during and after any sampling of marine mammals.

In the event of an incidental death of a marine mammal during AFSC research cruise:

- Stop or conclude regular sampling activities until the marine mammal specimens have been collected and the carcass returned to the sea. It may be necessary to jog or run to the next station during this time.
- Only trained and properly equipped personnel shall collect data and specimens from marine mammals.
- Proper personal protective equipment (PPE) should be worn during all sampling AND
- Prior to sampling marine mammals, the following pathogen exposure control plan detailing proper PPE, handling, and clean-up procedures MUST be followed:

Personal Protective Equipment (note this is the same PPE worn to conduct to sample fish with the addition of a face shield in certain circumstances, but it is to be saved for use only when taking biological samples from a marine mammal. Funding for this will be supplied by Center Director's Office):

- Nitrile gloves (New pair, dispose of after use and decontamination procedures)
- Rubber boots without holes that can be disinfected
- Face shields (for tissue sampling, including snout or head removal)
- A new set of rain bibs and a jacket that does not have any holes or tears

Pregnant or Immunocompromised Personnel

If you are pregnant, possibly pregnant, or immunocompromised you should not volunteer to collect biological samples due to the increased risk of zoonotic diseases. Inform your supervisor of your situation, so that accommodations may be made.

General Protective Guidelines

Follow blood-borne pathogens procedures for humans and treat the sampling area like a spill requiring decontamination and clean-up. However, marine mammal carcasses and cleaning wastes are not considered Hazardous Waste.

Hand Hygiene

Gloves should always be worn while handling a carcass. Wash hands after touching a carcass and after contact with blood, tissue, body fluids, secretions, excretions, or articles contaminated by these fluids. Wash hands before eating, drinking, or smoking; and whenever hands are visibly soiled. Avoid touching your face or other exposed body parts until you have washed thoroughly. Alcohol-based gels may be used if hands are not visibly soiled, but hand washing with soap and

running water is preferred.

Use of Gloves
Wear nitrile gloves for sampling. Other gloves can be used when cleaning contaminated environmental surfaces and equipment; when handling dirty laundry; when handling tissues. Gloves should be removed promptly and disposed of after use. Hands should be washed immediately after glove removal. Change torn gloves immediately.

Protective Outerwear
Wear the supplied protective outer garments (boots, bib, and jacket) for taking marine mammal samples, when working with carcasses, tissues, and when conducting cleaning chores. These should be decontaminated and changed whenever soiled and after performing any sampling. Boots must be fully water-resistant and easily cleanable. Impermeable outerwear should be worn during sampling and whenever substantial splashes or large quantities of bodily fluids may be encountered. Place soiled garments in a bag for washing later, see the decontamination section below. Any disposable items in the garbage.

Face Shields
Wear a face shield when a carcass is open, has open wounds/lesions, when removing tissues, or if the placenta/umbilicus is present.

Buddy System
Either the Field Party Chief or Deck Lead who has been trained in safe marine mammal collection procedures shall be the primary individual collecting tissues. However, a fully suited person shall stand by to assist the collector and aid in specimen bagging, containment, and decontamination.

Other Equipment
In addition to the required PPE identified above, additional sampling equipment shall be prepared for use. This equipment should be suitable for decontamination or direct disposal. This equipment can include:

1. Sampling vials with DMSO, forceps, and scalpels. (supplied by the compliance officer and MML)
2. Serrated knives of various sizes ranging from 3 to 12 inches. (use what's available)
3. Plastic bags that are sufficient for sample size and for bagging in three successively sealed bags. (these are analogous to those used for fish specimens)
4. Freezer box for storing frozen specimens. (If available, freezer storage is dependent on the ship's availability)
5. Detergent Soap and cleaning brushes.
6. Bleach diluted to a 1:10 solution for decontamination. (may need to be supplied)
7. Sea water hose is ready for cleaning.

Shower
After sampling, storing samples, and decontamination, it is recommended that the persons

involved in the sampling take a shower before continuing work or eating a meal.

Protective Actions for Sampling Procedures

Sampling

1. Wear PPE: gloves, face shield, and impermeable outerwear (bibs and rubber boots).
2. Chief Scientist and Vessel Operator choose a safe area to work that is away from food handling areas, easy to clean and decontaminate, and that is near a discard chute to the sea.
3. Discard gloves and wash hands before touching clean items.
4. Follow sampling procedures below.
5. Place bagged specimens in a freezer or other heavy box to prevent puncture of the bags and contamination of anything in the freezer.
6. DO NOT USE ANY POWER TOOLS TO REMOVE TISSUES.
7. Eating and drinking are not allowed in the sampling area.

Environmental Infection Control

Cleaning and Disinfection of PPEs, Equipment, and Environmental Surfaces

1. Wear gloves when cleaning and wash hands afterwards.
2. First, using soap and water, clean surfaces (deck, freezer, table) and equipment (scalpel handles, measuring tapes, etc.) to remove organic matter.
3. Next, spray the area with ship-approved disinfectant (e.g., 70% alcohol or a 1:10 chlorine bleach solution) and let sit for 10 minutes. Disinfectant should be used according to manufacturer's instructions.
4. Rinse all PPE, instruments, and surfaces with fresh water after disinfecting.
5. Minimize dust and aerosols when cleaning.

Handling Laundry

Wear gloves when handling soiled laundry. Wash (with standard laundry detergent) and machine dry soiled clothing separately from other items. Use separate storage and transport bins for clean and dirty laundry.

Decontamination and Blood or Body Fluid Spill Response

Don gloves, face shield, and protective clothing (including rubber boots if the spill is on the floor and may be stepped in) before beginning the clean-up. Contain spill with absorbent material (e.g., paper towels or absorbent pads in spill kit). Pick up the absorbent material, then seal it in a series of leak-proof plastic bags and place them in the regular trash for disposal. Clean and disinfect the area as above.

Employee Health

Documenting and Reporting Exposure Incidents

1. Report incidents that result in injury or potential exposure to an infectious agent to your supervisor and Field Party Chief.

2. After the sampling event, monitor personnel for any signs or symptoms of infection or flu-like symptoms.
3. Submit a NOAA incident report online through the emergency contact procedures for the vessel. The RACE Directorate will report the incident to the NOAA Safety Office.
4. If consultation with a health care provider is necessary, be sure to inform them of the exposure to the animal(s).
5. As available, provide health care provider literature materials regarding the treatment of infections with tetracycline.

Handling: Previously Dead or Injured marine mammals or protected species

If a previously dead or injured marine mammals, or animals entangled in gear are encountered and it is certain it was not due to AFSC fishery research activities. A stranded animal is one that is dead on the beach or in the water, one that is alive on land and unable to return to the water and/or in need of medical attention, or a live animal in the water that is unable to return to its natural habitat under its own power or without assistance. Please don't move or touch the animal.

Report sighting as follows:

- Previously dead marine mammal or protected species brought aboard. Record encounter by taking photograph and providing information from the haul: date, location (including latitude and longitude). Report to Division Directorate, Compliance Coordinator, and AFSC Marine Mammal Lab (contact Nancy Friday).

- Previously dead marine mammal or protected species floating by research vessel. Document encounter by recording date, location of stranding (including latitude and longitude), number of animals, and species. Take pictures from different angles if you are able.

- Injured and entangled marine mammals or protected species that are not injured or entangled by AFSC research activities. Document with photos, collect date, time and location. Report to Alaska Marine Mammal Stranding network (24-hour Hotline: (877) 925-7773) and the Alaska SeaLife Center in Seward, (1-888-774-7325, 24-hrs).). In some cases, vessel captains may be required by law to attempt disentanglement; it is the responsibility of a vessel captain to understand and carry out any legal requirements. If disentanglement is attempted, standard procedures on mitigating the risks to the animal and persons aboard the vessel should be followed.

- NOAA Fisheries statewide 24-hour Stranding Hotline: (877) 925-7773 or (877) 9-AKR-PRD
- If a large whale is alive and entangled in fishing gear, the vessel should immediately call the U.S. Coast Guard (USCG) at VHF Ch. 16
- Protected Resources Office (M-F 8:00-4:00):
    - Juneau: (907) 586-7235
    - Anchorage: (907) 271-5006
- Alaska SeaLife Center Stranding Hotline: (888) 774-7325
- USFWS (Sea Otters, walrus, polar bears): 1-800-362-5148

- **NOTE**: If the stranded animal is a walrus, sea otter, or polar bear, call the Marine Mammals Management Office of the US Fish and Wildlife Service in Anchorage (1-800-362-5148 FREE, business hours) or the Alaska SeaLife Center in Seward (1-888-774-7325, 24-hrs).

If you find a sea otter carcass, please contact the Marine Mammals Management office of the Fish and Wildlife Service at 1-800-362-5148 or the Alaska SeaLife Center at 1-888-774-7325. The carcass is less than 24 hours old if:

- There are no maggots or fly eggs on or under the body
- There is no foul odor or dark brown/ black fluid emanating from body
- The eyes are present and not wrinkled or shrunken
- The animal was observed alive within the last 12 hours, i.e., not observed dead for more than 12 hours.
- The body is intact and not scavenged
- The fur does not pull free in clumps when grasped

If you find a dead sea otter that is less than 24 hours old, please call the numbers above and they will arrange for shipment back to our laboratory. Do not disturb the carcass until you have contacted the Fish and Wildlife Service or the Alaska SeaLife Center. However, if the tides, predators or people may disturb the carcass, please secure it. Be prepared to give the exact location and take photographs if possible. Your help in collecting this information is invaluable.

Handling: Returning Live Animals to Sea

If a marine mammal is brought aboard alive (even if injured), the goal should be to release them without removing them from the water or to return the animal to the water as rapidly as possible. If animals come onto the vessel, the crew should attempt to provide an unobstructed pathway for the animal to return to the sea, usually down the trawl ramp or transom opening. Of paramount importance is the safety of the scientists and crew. Unnecessary crew should seek the safety of the boat house. Any actions taken to record data, take pictures, etc., on captured marine mammals should be performed only after an evaluation of the risks involved to personal safety. Unacceptable human risk is not authorized in assisting marine mammals (e.g., scientists and crew are prohibited from entering the water to aid a marine mammal). A marine mammal may come aboard in a shocked state and look dead. Therefore, all animals brought onboard should be treated as if alive, and all safety precautions are taken.

Once the risks and safety issues have been properly assessed and managed, identify the animal to species if possible, assess the condition (noting any injuries), take pictures from different angles, and then release the animal and enter the data into the AFSC Protected Species Handling Form (APSH). Data collection is conducted in such a manner as not to delay the release of the animal(s) and includes species identification, sex identification (if the genital region was visible), estimated length, disposition at release (e.g., live, dead, hooked, entangled, amount of gear remaining on the animal, etc.) and photographs. The Chief Scientist and crew collect as much data as possible from captured animals considering the disposition of the animal; if it is in imminent danger of drowning, it is released as quickly as possible.

Sampling: Dead Marine Mammals

MMPA regulations and Letters of Authorization authorizes NMFS to collect biological samples in accordance with section 109(h) of the MMPA for live/dead marine mammals (non-listed), or under a directed scientific research and enhancement permit. Measuring, collecting data from, and sampling dead, incidentally caught marine mammals is a priority for NMFS and AFSC. These samples would be collected for diagnostic purposes and not solely or specifically collected for research; therefore, directed a scientific research and enhancement permit under MMPA section 104 is not required nor is an ESA section 10(a)(1) (A) directed research permit required. The following is a table of ESA-listed marine mammals [DO NOT TAKE BIOLOGICAL SAMPLE], in addition to Walrus.

Cetaceans	**Pinnipeds**
Blue Whale	Steller Sea Lions W of 144W
Bowhead Whale	Bearded Seals – Beringia DPS
Cook Inlet Beluga	Ringed Seals – Arctic subspecies
Fin Whale	Pacific Walrus [ESA candidate species]
Humpback Whale	
North Pacific Right Whale	
Sei Whale	
Sperm Whale	
Gray Whale	

Photos/Videos

Use NMFS-issued or other cameras to take photos of dead marine mammals and related data points such as carcasses and evidence of fish damaged by depredation from sperm whales, killer whales and/or sea lions. Photos will be used by MML scientists to verify species and sex identifications.

When taking pictures of dead marine mammals, include the following characteristics:

Pinnipeds	Cetaceans
Full body (dorsal, ventral, side views)	Full body (dorsal, ventral, side views)
Head straight-on (with vibrissae visible)	Dorsal fin
Head in profile (with ear/ear hole visible)	Saddle patch
Fore flippers	Flukes (underside)
Hind flippers	Sex determination
Sex determination	Other distinguishing marks (scars, scratches, etc.)
Brands and/or flipper tags	

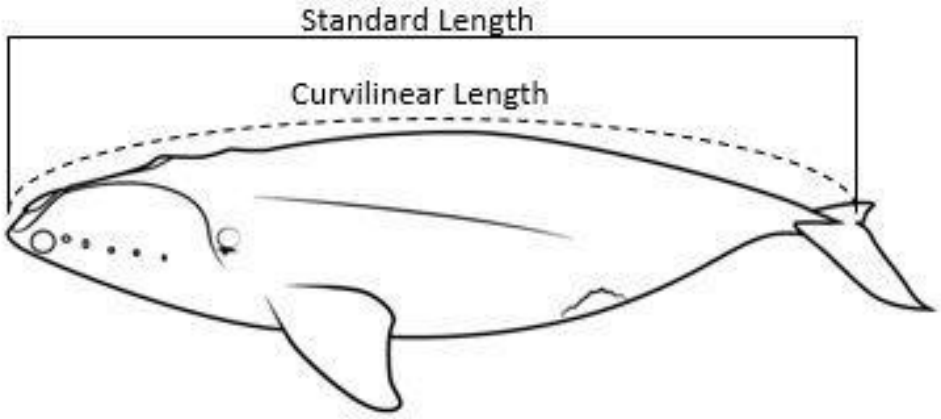
Pinnipeds	Cetaceans
Other distinguishing marks (scars, scratches, etc.)	

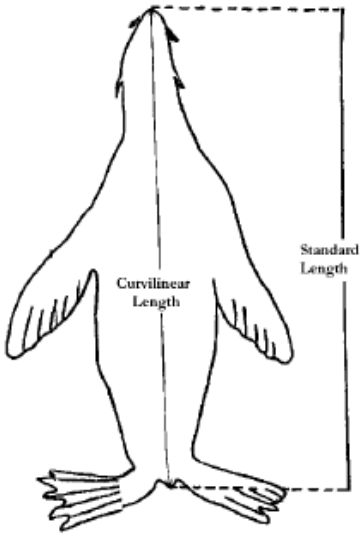
Marine Mammal Measurements

All marine mammals killed by gear must be measured. There are two acceptable methods for measuring marine mammals:

Standard length: This is the preferred method of measurement. Measure the animal in a straight line from the tip of the snout or rostrum to the tip of the tail flesh or tail notch on the unskinned body, belly up, ideally with the head and vertebral column on a straight line. Record your measurement to the nearest centimeter.

Curvilinear length: This is the shortest surface distance from the tip of the snout or rostrum to the tip of the tail or tail notch along the back, belly, or side. This method is used if rigor has set in or the animal is too large or deteriorated to maneuver. Take the measurements with the flexible measuring tape provided by NMFS. Record your measurement to the nearest centimeter.





Determining Marine Mammal Sex

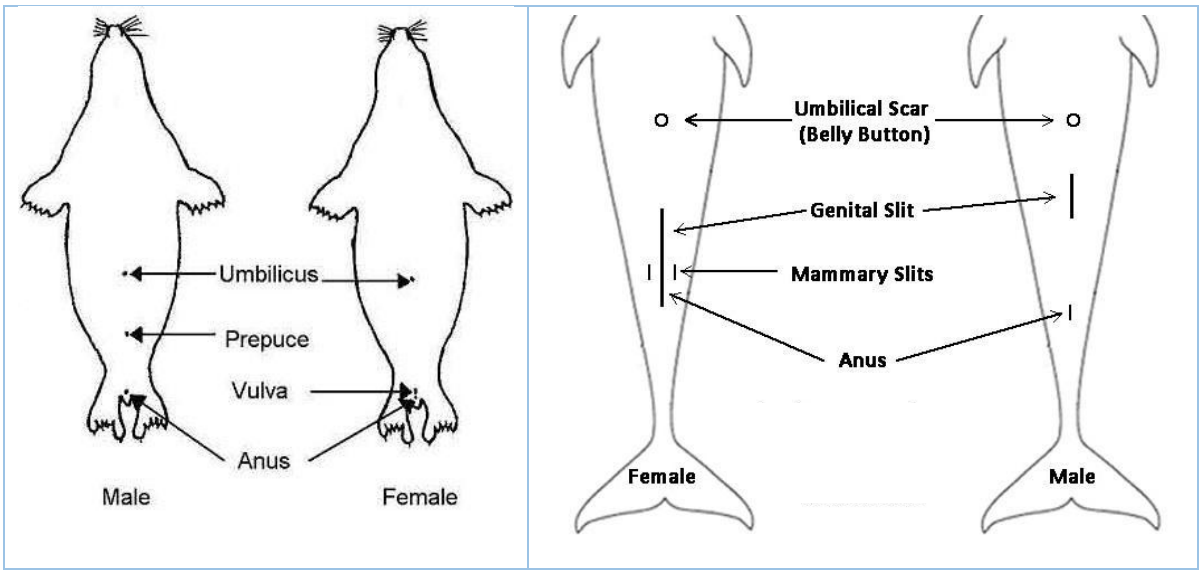
To accurately determine the sex of marine mammals, you will need to examine the ventral body surface and hind flippers (pinnipeds). If necessary, ask for assistance to move the carcass and access the appropriate part of the body.

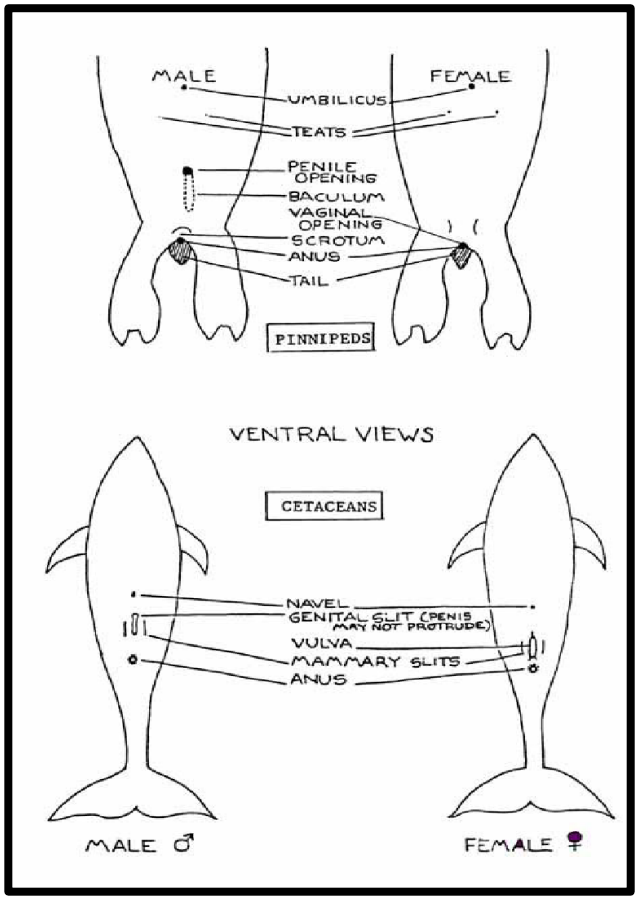
Pinnipeds: spread the hind flippers to expose the perineal area.

- Males have one opening in the perineal area (anus) and a penile opening (prepuce) mid-way between the navel (umbilicus) and the anus. The penis may also be extended/visible (more common in Steller sea lions).
- Females have two openings in the perineal area: the anus and vulva.

Cetaceans: find the navel, the anus, and the genital slit.

- Males have a genital slit that is located between the navel (umbilical scar) and the anus.
- Females have a single ventral genital slit which contains both the vagina and the anus. Females also have mammary slits which flank each side of the genital slit.


Umbilicus
Prepuce
Vulva
Anus
Male
Female
Umbilical Scar
(Belly Button)
Genital Slit
Mammary Slits
Anus
Female
Male


MALE
FEMALE
UMBILICUS
TEATS
PENILE OPENING
BACULUM
VAGINAL OPENING
SCROTUM
ANUS
TAIL
PINNIPEDS
VENTRAL VIEWS
CETACEANS
NAVEL
GENITAL SLIT (PENIS MAY NOT PROTRUDE)
VULVA
MAMMARY SLITS
ANUS
MALE ♂
FEMALE ♀

Pinniped Samples (Except Walrus and ESA-listed species)

Do not collect parts or specimens from walrus. They are managed by the US Fish and Wildlife Service and are therefore not covered under the AFSC MMPA collection permit.

The Marine Mammal Laboratory has requested the snout of any non-ESA pinnipeds carcasses that were killed by gear**. Only collect specimens from pinnipeds that were killed by gear; do not collect specimens from previously dead pinnipeds.** Snouts provide valuable data: they help MML scientists verify species and sex identifications (e.g., morphology, genetic analysis of tissue), the upper canine teeth can be used to determine the animal's age, and the vibrissae (i.e., whiskers) can be used for stable isotope analysis. These specimens, combined with the other data you collect, help MML scientists assess the general health of pinniped populations.

Snout Specimens

Collect the snout of any seal if found dead in the fishing gear. On AFSC bottom trawl surveys, skulls can be part of the voucher specimen collection system.

To collect a pinniped snout:

1. Using a hack saw or other device, cut across the snout slightly in front of the eyes in a line that connects the corners of the mouth.
2. Do not remove the skin as fur coloration can be used to verify species identification.
3. Do not trim or cut vibrissae.
4. Place the snout in three plastic bags. Place a Bag and Tag label inside the outer bag and another label on the outside. Write the species and length of the pinniped in the Comments sections of the label.
5. Freeze; never store it in a preservative (e.g., formaldehyde).

Cetacean Samples (except ESA-listed species)

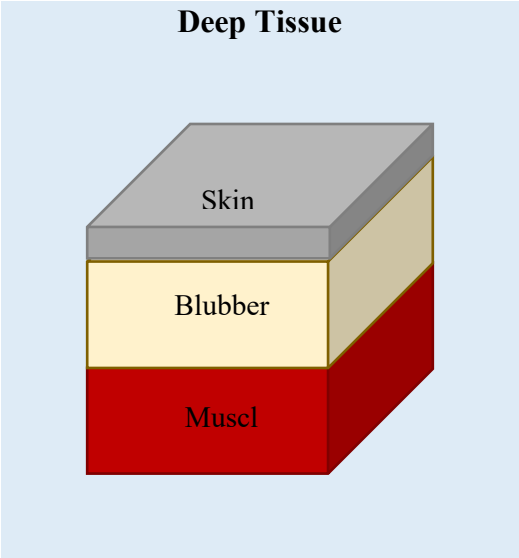
The Marine Mammal Laboratory has asked that AFSC scientists collect a deep tissue sample from all non-ESA cetaceans that are killed by gear and from previously dead cetaceans that are still in reasonably good condition and the body is largely intact. **Do not collect samples from cetacean carcasses with skin falling off the bone, unrecognizable body, gelatinous tissue, or missing skin.** MML scientists use skin tissue samples to verify species and sex identifications and to identify cetacean stock structure; deep tissue samples are analyzed for contaminant, fatty acid, and stable isotope profiles.

Deep Tissue Sample

To collect a deep tissue sample:

1. Cut a 2 inch square of tissue from the back, posterior to the dorsal fin.
2. The depth of the sample should be from the outer skin layer into the muscle layer, including the entire blubber layer, and include at least 1 inch of red muscle tissue.
3. To store this tissue sample, wrap it in aluminum foil, or seal it in a ziploc bag (aluminum foil is preferred). Place the foil package (or sealed ziploc bag) inside another Ziploc bag with a completed Bag and Tag label.

4. This sample should be frozen and kept frozen to the best of your ability during transit.
5. Record specimen information on the AFSC RPSI form. Include in the Comments section how you obtained the specimen.



5.0 Handling Procedures: Seabirds

Seabirds, including ESA-listed seabirds, may be incidentally caught in most gears or may come aboard at night, especially when attracted to lights. While it is highly likely birds will be dead in nets, especially those that are towed, it is possible that living birds may be caught in research gear. As with marine mammals, maintaining personal safety is of the greatest importance when handling a captured seabird. Potential injuries include bites and scratches from a live bird and potential diseases on both living and dead birds. Also, be sure to protect your eyes from their sharp bills and potential to reach with their long necks.

The AFSC has a salvage permit from the U.S. Fish and Wildlife Service for birds incidentally caught during AFSC fisheries research activities (Number MB035470-0). Make sure that copies of this permit accompany the survey documents. The Chief Scientist or designee will complete the AFSC Protected Species Encounter form for any interactions with Short-Tailed albatross. This permit covers the collection (salvage) of all seabirds that are not listed under the Endangered Species Act. Generally, due to the collections happening in the Observer Program, we ask only that Laysan and Black-footed albatross are retained on research cruises, unless there is a bird that you need to bring back to verify the identification.

Because short-tailed albatross and eiders are ESA-listed species, our salvage permit does not cover collection of the carcass. However, the Biological Opinion does require that we keep it, and coordinate closely with the USFWS on retention, transportation, and final location. If a

short-tailed albatross or eider is caught, regardless of gear type, and regardless of whether the mortality occurs in a sampled portion of the haul, it must be retained and reported immediately to the Division Directorate and the Environmental compliance coordinator. The AFSC will then notify the USFWS of any mortality within 2-business days of the initial reporting. The AFSC, including the IPHC is allowed a maximum of three (3) short-tailed albatross as incidental take as a result of fisheries research in 5 years 2020-2024. If AFSC, including IPHC, exceeds this amount it represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided.

Dead Seabird Handling (Albatross and Eiders)

All unidentified albatross and eiders killed during research activities must be kept until identified as a listed or non-listed species. In the event the albatross or eider cannot be readily identified, carcasses should be retained for confirmation as non-listed albatross, and pictures documenting the species should be taken for verification. All efforts must be made to recover any dead short-tailed albatross, including gaffing them if they fall off of the hook. Coordinate with Anchorage Fish and Wildlife Ecological Services Branch or Conservation Office prior to shipping. Note: It is unlawful to knowingly dispose of the carcass of any ESA species by dumping the carcass overboard of any vessel.

1. Identify the bird, if possible, to species.
2. Photograph the bird. If possible, take the following pictures- overall dorsal (wings outstretched), overall ventral (wings outstretched), close up of head/beak (near a measuring board if possible), bands or tags, and any wounds, marks, damage.
3. Describe condition of bird including any damage (wounds, scars).
4. Check for presence of legbands or tags and note number and location of any.
5. If the bird is a Short -tailed Albatross, Spectacled Eider, Steller's Eider, or other albatross, retain the bird, assuming it is fresh- (i.e. caught by the survey and not dead for other reasons).
6. Prepare a label with should include species, date of mortality, name of vessel, location (latitude and longitude) of mortality, name of Chief Scientist or vessel operator and any legband numbers.
7. Place carcass in absorbent material if possible, and in a waterproof plastic bag. Multiple birds can be placed in same bag. Place label with identifying information bag.
8. If the bird is a Short -tailed Albatross, Spectacled Eider, or Steller's Eider, contact your Divisional Directorate. They will contact the AFSC Seabird Biologist who will contact the USFWS for disposition of the bird.
9. Record the information on the AFSC Protected Species Handling form and forward to the Survey Coordinator and Division Directorate.

Storing Dead Birds

1. Only collect freshly killed seabirds (those killed by research gear). Follow above instructions.
2. If carcasses can be shipped within 24-36 hours of death, it is recommended they are kept cold but not frozen.
3. If carcasses cannot be shipped within 36 hours of death, it is recommended that they are frozen.
4. Collect birds under the assumption that in infectious disease or toxin is involved – use handling instructions above to ensure you are protected.

Shipping Dead Birds

Coordinate with the AFSC Seabird biologist and USFWS to ship any collected birds.

Freeing live birds

Consider safety when processing live birds. Live birds can be entangled in gear or land on the boat and are unable to take flight. If a live bird is captured by any research gear, then first disentangle or unhook the bird. At night, especially when anchored near the shore, turn off unnecessary lights. Each morning check for stranded birds on the deck, especially under tables and in dark areas.

If the bird is not listed under the Endangered Species Act, then use the following procedures and complete the AFSC Protected Species Handling form:

- Identify the bird, if possible, to species and sex.
- Photograph the bird. If possible, take the following pictures- overall dorsal, overall ventral, close up of head/beak, bands or tags, and any wounds, marks, damage.
- Describe condition of bird including any damage (wounds, scars).
- Check for presence of bands or tags and note number and location of any.
- Comment on response of bird after release (did it fly immediately, for example).

Protocol for ESA-listed seabirds

If an injured or sick short-tailed albatross is observed either on the water or entangled in the research gear, then inform USFWS via the Division Directorate. Live birds must be retained in a safe location.

1. If caught in hook and line, stop vessel to reduce tension on the line and bring bird aboard using a dip net.
2. Wrap the bird's wings and feet with a clean towel to protect its feathers from oils or damage.
3. Remove any entangled lines from the bird and determine if the bird is dead or alive. If dead, follow procedure for processing dead birds. If alive, place bird in a safe, enclosed place and immediately contact NMFS, USCG or USFWS. If unable to make contact for

24-48 hours, determine if the bird is lightly, moderately, or deeply hooked (see description below).

4. If bird is deeply hooked, keep bird in a safe, enclosed place until further instructed. Do NOT release the bird.
5. If bird is lightly or moderately hooked, remove hook by cutting the barb and backing hook out.
6. Allow bird to dry for 1/2 hour to 4 hours in a safe, enclosed place. Refer to Release Guidelines.
7. Record information on the AFSC Protected Species Handling Form.

Record Bird Condition:

- Lightly Hooked: Hook is clearly visible on bill, leg or wing.
- Moderately Hooked: Hooked in the mouth or throat with hook visible.
- Deeply Hooked: Hook has been swallowed and is located inside the bird's body below the neck.

6.0 Handling Procedures: ESA-Listed Fish

The AFSC considers the adverse impacts of its various research activities on ESA-listed salmonids to be very small in magnitude, dispersed in time and geographic area, and likely to have minimal impact on all ESUs. In contrast to these minor adverse effects, AFSC research on Pacific salmon has beneficial impacts on both ESA-listed and non-listed ESUs through its contribution to sustainable fisheries management and monitoring changes in the marine environment important to the recovery of these species.

Handling of Salmonids

Salmonids will be handled with normal catch processing protocols for the various surveys. For most surveys, salmonids will be identified, weighed, sexed, and measured. They will be discarded with normal procedures. For studies and surveys targeting salmonids or salmonids as species of interest, additional sampling may occur for coded wire tags and genetic samples. Data will be recorded as per normal collection protocols.

7.0 Historical Preservation of Artifacts

The AFSC will avoid manmade obstacles through use of on-board sonar, actively avoid known obstacles during sampling, and will report any potentially historic properties encountered during research activities to the Alaska SHPO. In the event of an inadvertent discovery the AFSC shall stop work in the area and contact the Division Directorate who will then contact the environmental compliance office who will contact the Alaska SHPO for guidance. Any items inadvertently discovered must be documented. Documentation must include the nature, extent and location of artifacts of potential cultural or historic significance. Object should be retained, if practical, for additional analysis and determination of historic significance. If it cannot be retained, take photos and measurements of the object and await further guidance before discarding object.

8.0 Documentation and Reporting

How and When to Report

AFSC policy identifies the following types of documentation for encounters with protected species:

- AFSC Protected Species Encounter Form (APSEF) – to be used if "Move-on" rule employed, for significant observations, and direct interactions.
- AFSC Protected Species Handling Form (APSH) – to be used when a direct interaction allows for the collection of meristic and/or biological data from a protected species.
- Photos and videos – whenever an uncommon protected species is observed, when there is a direct interaction with a protected species see form for desired data.
- Protected Species Incidental Take (PSIT) database – to be filled out immediately after there is a direct interaction with a protected species.

Photos and Videos

Some things to include:

- Please remember to set the date and time on the camera you are using!
- For marine mammals:
  - Imagery used by MML scientists to verify species and sex identifications.
  - Videos can be very useful, especially for animals moving near the vessel (they can difficult to photograph).
  - Try to include distinguishing marks of the individuals in your photos: pinniped brands and/or flipper tags; scars, scratches, and the saddle patches on killer whales are useful for identifying individuals.

Encounter	Documentation	Reporting
Significant observation, except North Pacific right whale	• APSEF (hardcopy, digital) • Photos/videos	End of survey
Significant observation, North Pacific right whale	• APSEF (hardcopy, digital) • Photos/videos	Immediately
Direct interaction	• APSEF and APSH (hardcopy, digital) • Photos/videos • PSIT	Immediately
Stranding/entanglement not due to AFSC research activities	• APSEF (digital) • Photos/videos	Immediately

Table 2: Types of encounters, required documentation, and when to report.

Encounter	Reporting Contacts
Significant observation	• Division Directorate • AFSC Compliance Coordinator – Rebecca Reuter 1-206-526-4234 Rebecca.Reuter@noaa.gov
Direct interaction, except ESA seabirds	• Division Directorate • Compliance Coordinator – Rebecca Reuter 1-206-526-4234 Rebecca.Reuter@noaa.gov • USFWS Marine Mammals Program (sea otters, walruses, polar bears): 1-800-362-5148
Direct interaction, ESA seabirds	• Division Directorate • USFWS (contact within 48 hours) USFWS Fairbanks, Claire Montgomerie: 907-456-0442, 808-756-8393 cell Anchorage -Field Supervisor, 907-271-2888 • Alaska Sea Life Center (Short-tailed albatross)

	1-888-774-7325 ● AFSC Compliance Coordinator – Rebecca Reuter 1-206-526-4234 Rebecca.Reuter@noaa.gov
Stranding/entanglement, marine mammals and seabirds	● AK Regional Stranding Network 1-877-925-7773 1-907-586-7070, Mandy Keough 1-907-271-3448, Barbara Mahoney office 1-907-360-3481, Barbara Mahoney cell ● Alaska Sea Life Center (all USFWS species) 1-888-774-7325 ● AFSC Compliance Coordinator – Rebecca Reuter 1-206-526-4234 Rebecca.Reuter@noaa.gov

Table 3: Contact information for reporting protected species observations and interactions. Note: AFSC Compliance Coordinator should be included in all communications.

AFSC Protected Species Encounter and Handling Forms

The AFSC Research Protected Species Interaction Forms (ARPSIF) was designed to capture all the important information necessary when reporting a significant observation or direct interaction with a protected species, e.g., cruise, location, interaction type, and animal condition (Figure 2). **All significant observations of and direct interactions with protected species must be documented on an APSEF.** The form should be completed by the Chief Scientist or a designated alternate. A secondary form, the AFSC Research Protected Species Specimen Sub-Form, is used to record additional information about the animal(s) and record any biological specimens collected.

Form #1: AFSC Protected Species Encounter Form

The following are instructions for completing the APSEF:

Header Info

Cruise Name	
Cruise Number	(if available)
Vessel Name	
Chief Scientist/Recorder	Person recording the encounter
Date	MM/DD/YY
Time	HHMM plus time zone: ADT (Alaska Daylight Time, spring/summer), AST (Alaska Standard Time, fall/winter), UTC (Coordinated Universal Time)

Location

Station Number	(if applicable)
Region/Area	
Latitude	
Longitude	Circle E or W
Gear Type	(if applicable)
Depth	Seafloor depth; circle appropriate units (m, ft, fm)
Sea State	Beaufort scale
Wind	Speed (mph), Direction
Cloud Cover	As percent coverage
Visibility	In feet, yards, miles

Encounter

Encounter Type	Choose one: Significant Observation or Direct Interaction
Closest Distance	Record the species' closest distance to the vessel in meters; record 0 if the animal came on board (go to Specimen form)
Move-On Rule Employed	Choose one: Wait to Clear (waited for the animal to clear the intended work area), Move Station (moved to a new location to avoid the interaction), Conduct Work (conducted work despite the interaction),
Describe Encounter	What happened – if narrative is long – add additional sheets

Describe steps taken to avoid encounter?	Monitoring, move-on, haul gear early or later, etc.

Protected Species

Species	Common and/or scientific name
Distinguishing Characteristics	Describe the physical and/or behavioral characteristics that led you to identify the species
No. of Animals	Number of animals involved in the interaction; if estimated, please indicate “estimate”
Describe Animal Behavior	Were they feeding, transiting, frolicking, bow-riding, etc.
Documentation	Were photos or videos taken? Submit with form.

Form #2: AFSC Protected Species Handling Form

The following are instructions for completing the Handling Form. Use a handling form if an animal is injured, captured, or from any other direct interaction of a protected species with the gear or vessel. Use one form per animal examined or sampled.

Header Info

Cruise Name	
Cruise Number	(if available)
Vessel Name	
Chief Scientist/Recorder	Person recording the encounter
Date	MM/DD/YY
Time	HHMM plus time zone: ADT (Alaska Daylight Time, spring/summer), AST (Alaska Standard Time, fall/winter), UTC (Coordinated Universal Time)
Species	Common and/or scientific name
Specimen No.	e.g., 1 of 1 (only one animal examined/sampled), 2 of 3 (for the second of three animals examined/sampled)

External Exam

Length	Length of the animal; circle appropriate units (cm, m)
Length Type	Circle one: Curvilinear, Standard, Total
Sex	Circle one: Female, Male, Unknown
Brand/Tag	Describe brands or tags: type, location on body, brand number, tag number and color
Distinguishing Marks	Describe any other distinguishing marks, including scars, scratches, etc.
Gear Damage	Describe any wounds due to vessel/gear: type (e.g., hook damage, net entanglements), location on the body or % of body, depth of the wound, etc.
Animal Condition	Record if animal(s) are Alive/Unharmed, Alive/Injured, Alive/Unknown, Dead/Killed by Vessel/Gear, Dead/Previously Dead, Dead/Unknown. Other information on animal condition, especially vitality or changes in behavior
Handling	Choose one: Freed Live Animal, Returned Live Animal to Sea, Processed Dead Animal
Description	Describe the handling procedures, including steps taken to avoid or reduce the extent of the interaction, changes in animal condition, etc.

Specimens

Photos/Videos	Photos/videos of the individual, include detailed file information
Sample Type	Each animal may have more than one sample collected; check the sample type and enter the sample number next to it (use Voucher numbers on RACE Bottom Trawl Surveys):
Whole Animal	Entire animal is collected
Skull	Pinnipeds; entire head
Snout	Pinnipeds; snout
Skin Tissue	Cetaceans; small skin tissue sample
Deep Tissue	Cetaceans; deep muscle tissue sample

AFSC Research Protected Species Encounter Form

Cruise Name: _____ Cruise Number: _____

Vessel Name: _____ Chief Scientist/Recorder: _____

Date: _____ (mm / dd / yyyy) Time: _____ (hh:mm) ADT / AST / UCT

Station Number: _____ Latitude: _____ °N

Region or Area: _____ Longitude: _____ °W / °E

Gear Type: _____ Depth: _____ m / ft / fm

Cloud Cover: _____ Vis: _____ Wind Speed/Dir: _____

Protected Species

Species Name: No. of Animals:

Distinguishing Characteristics:

Confidence: ☐ Sure ☐ Likely ☐ Unsure

Encounter

Encounter Type: ☐ **Significant Observation** ☐ **Direct Interaction** (must also complete Handling Form)

Closest Distance: m (Record 0 if came on board, struck vessel, or tangled in gear)

Move-On Rule: ☐ Waited to Clear ☐ Moved Station ☐ Continued Work ☐ N/A

Describe encounter, including steps taken to avoid/reduce encounter, employment of Move On Rule, post-encounter monitoring, etc.:

Documentation Checklist

Significant Observations	☐ Photos/Videos (list file names):		
Direct Interactions	☐ Handling Form	☐ Photos/Videos	☐ Samples
Report Immediately?	☐ Yes	☐ No	

Figure 2. AFSC Protected Species Encounter Form. Digital copy is fillable PDF.

AFSC Research Protected Species Handling Form

Cruise Name: _____ Cruise Number: _____

Vessel Name: _____ Chief Scientist/Recorder: _____

Date: _____ (mm / dd / yyyy) Time: _____ (hh:mm) ADT / AST / UCT

Species Name: _____ Animal No.: _____ of _____

External Exam			
Length:	cm / m	☐ Curvilinear	☐ Standard ☐ Total
Sex: ☐ Female	☐ Male	☐ Unknown	
Brand/Tag:	Distinguishing Marks:		
Describe animal condition, including alive/dead, killed or previously dead, injured/uninjured, wounds due to gear, and changes in vitality or behavior throughout the encounter:			
Describe handling procedures used to free/return the animal to sea or to process a dead animal:			

Specimens	
Photos/Videos (list file names below):	
Sample Type:	Sample Number(s):
☐ Whole Animal	
☐ Skull	
☐ Snout	
☐ Skin Tissue	
☐ Deep Tissue	

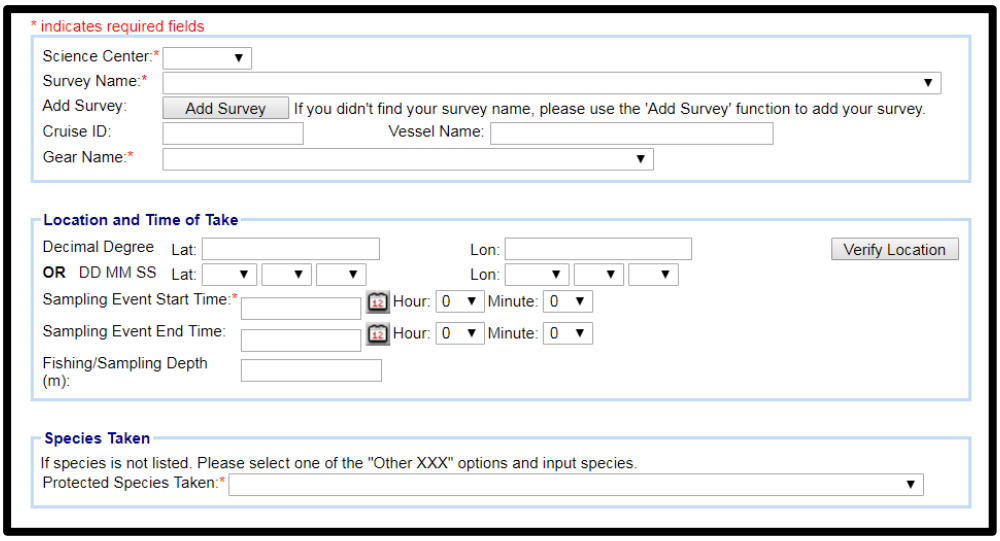
Figure 3. AFSC Protected Species Handling Form. Digital copy is fillable PDF

Protected Species Incidental Take Database

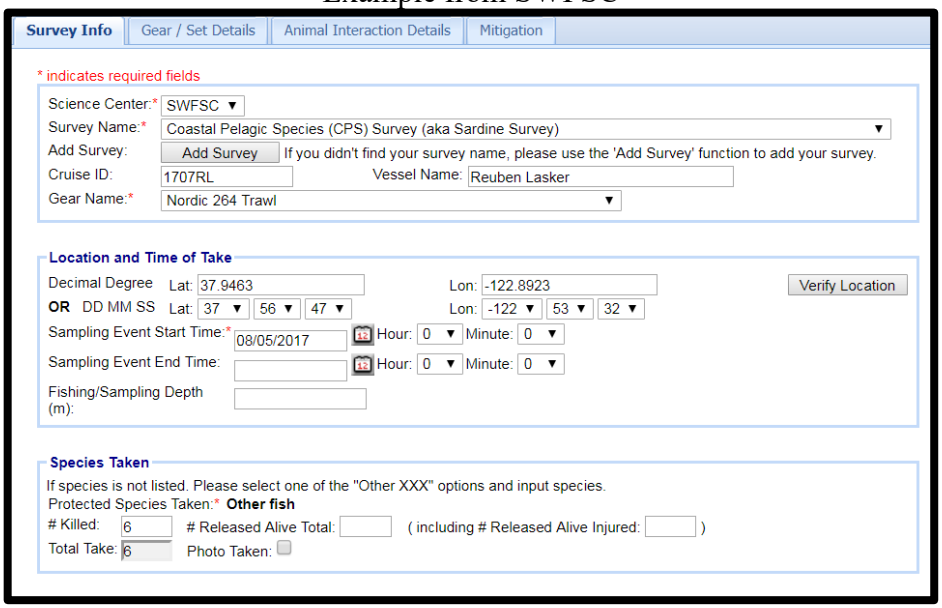
Use your NOAA email username/password combination to access PSIT database use this Web link: https://www.st.nmfs.noaa.gov/finss/psit/psitMain.jsp

Contact Erin McMichael, NMFS Office of Science and Technology (erin.mcmichael@noaa.gov) for *editing access and email alert notifications*. For any technical problems, please contact Wei Qiu (wei.qiu@noaa.gov)

1. All NMFS fisheries and ecosystem research incidental takes of species protected under the Marine Mammal Protection Act (MMPA), Migratory Bird Treaty Act (MBTA), and Endangered Species Act (ESA), **must be reported to the Protected Species Incidental Take database (PSIT) within 48 hours of the event happening.** Fields to be reported within 48 hours are shown below.



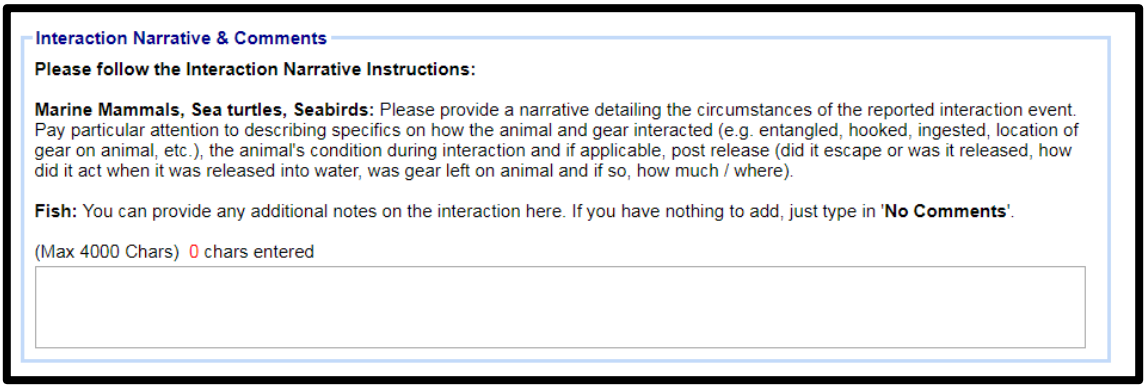
Example from SWFSC



1. Any photos, videos, or data forms associated with the incidental take can also be

uploaded within the 48 hours window.

2. A detailed narrative of the interaction can be provided in the box either within 48 hours (preferred) or within a week of the event, especially for marine mammals.

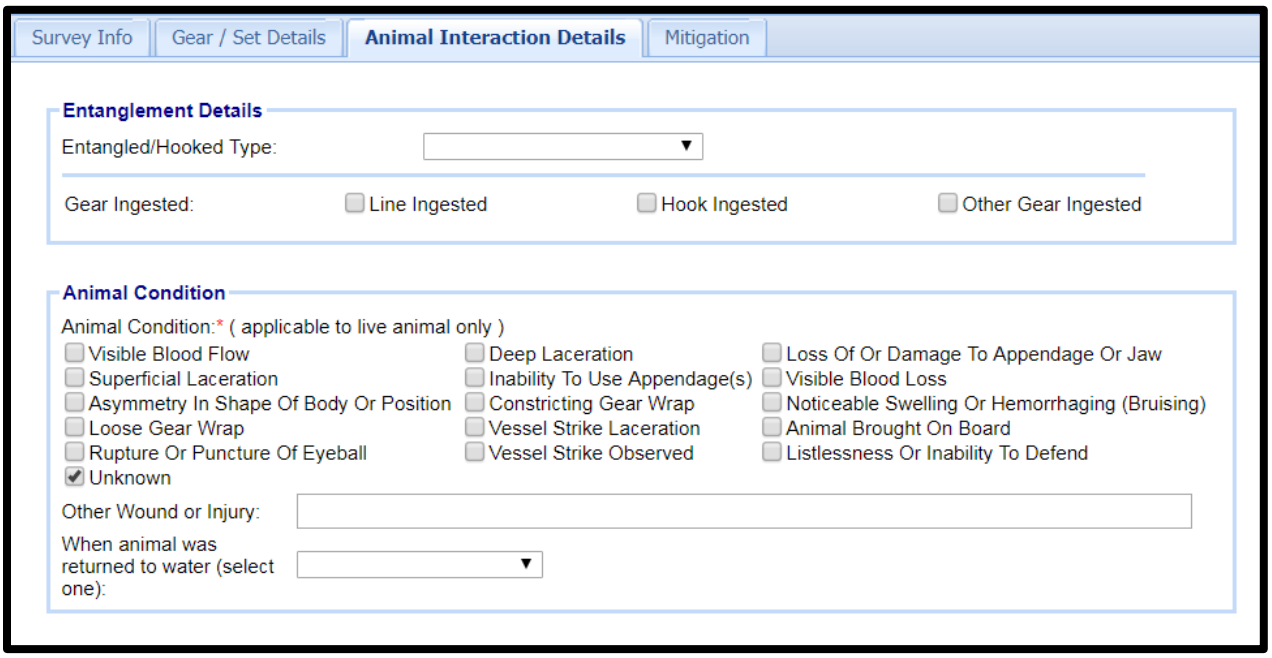


Additional gear-specific information (characteristics, deployment methods including any deviations), mitigation measures employed, biological samples collected, marine mammal watch logs, can be provided separately by uploading an attachment associated with a specific incidental take record preferably, **within a month of completing the survey.**

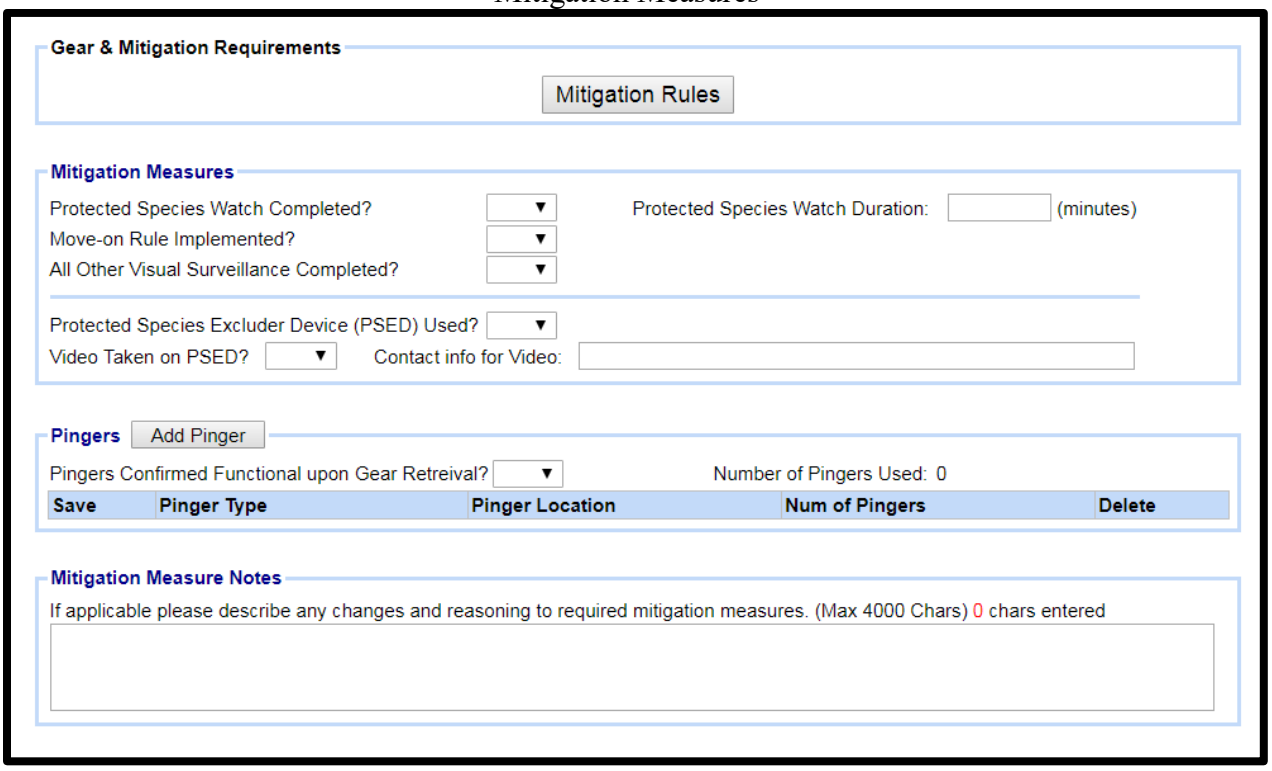
Examples of other data requested in PSIT:

Gear/Set Details

Animal Interaction Details



Mitigation Measures



9.0 Post-Cruise Actions

All forms from direct interactions must be sent immediately to the Division Directorate and the Environmental Compliance Coordinator. All other forms can be submitted when completing the debriefing survey at the end of the survey season, around mid-fall.

What to do with photos and videos? Upload all image and video files at the end of the debriefing form sent out in mid-fall.

What to do with birds? Send to REFM Seabird Coordinator (TBD)

What to do with snouts, skulls, cetacean tissues?

Contact: Katie Luxa (Katie.Luxa@noaa.gov, 206-526-6316) to coordinate pick-up of all marine mammal biological specimens. All marine mammal photos/videos should be shared with Katie via Google Drive.

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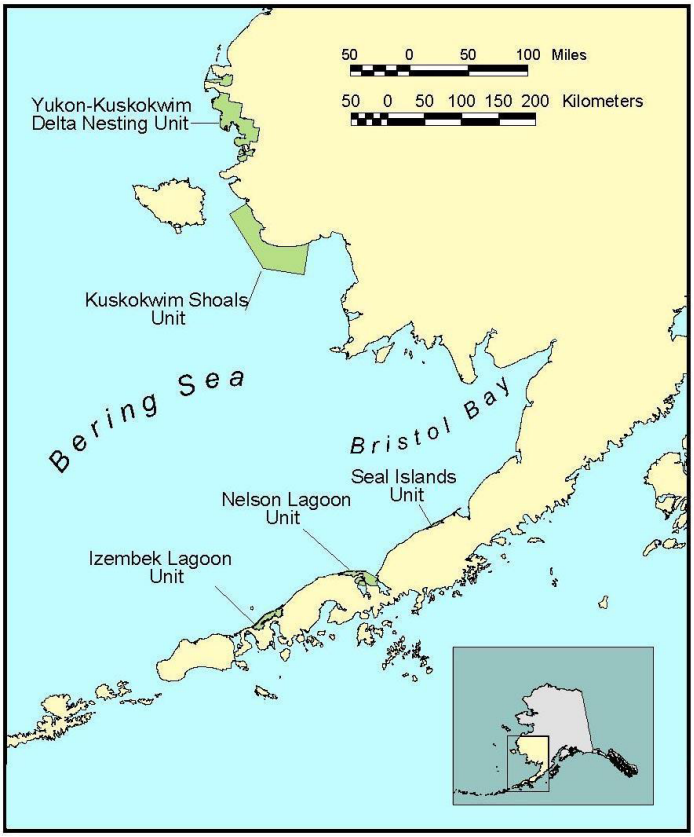
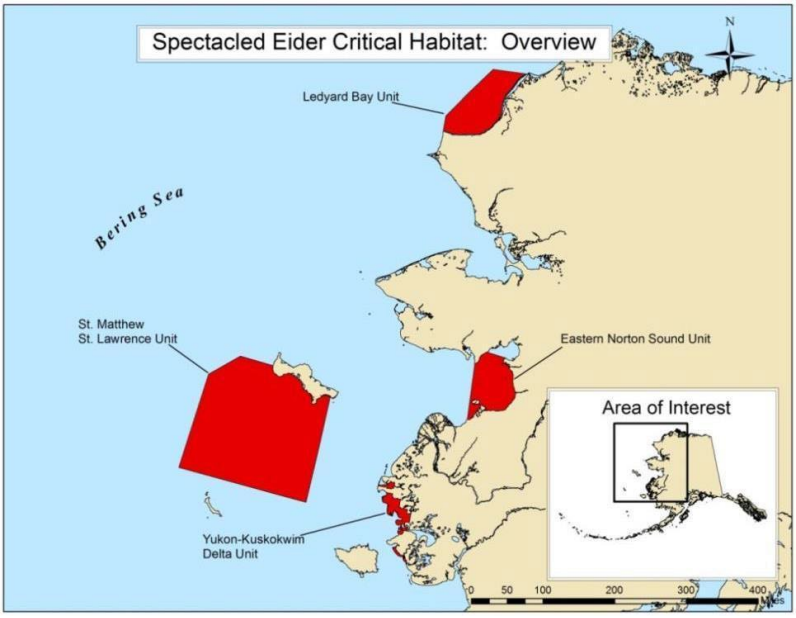
Appendix A. List of Steller sea lion rookeries.

This list will reference Lewis et al (2019) NOAA Tech Memo, in press, and reflects the most accurate location information for sites known to be currently used as rookeries, as well as sites designated as rookeries, even if they haven't been observed to be used as rookeries in recent years.

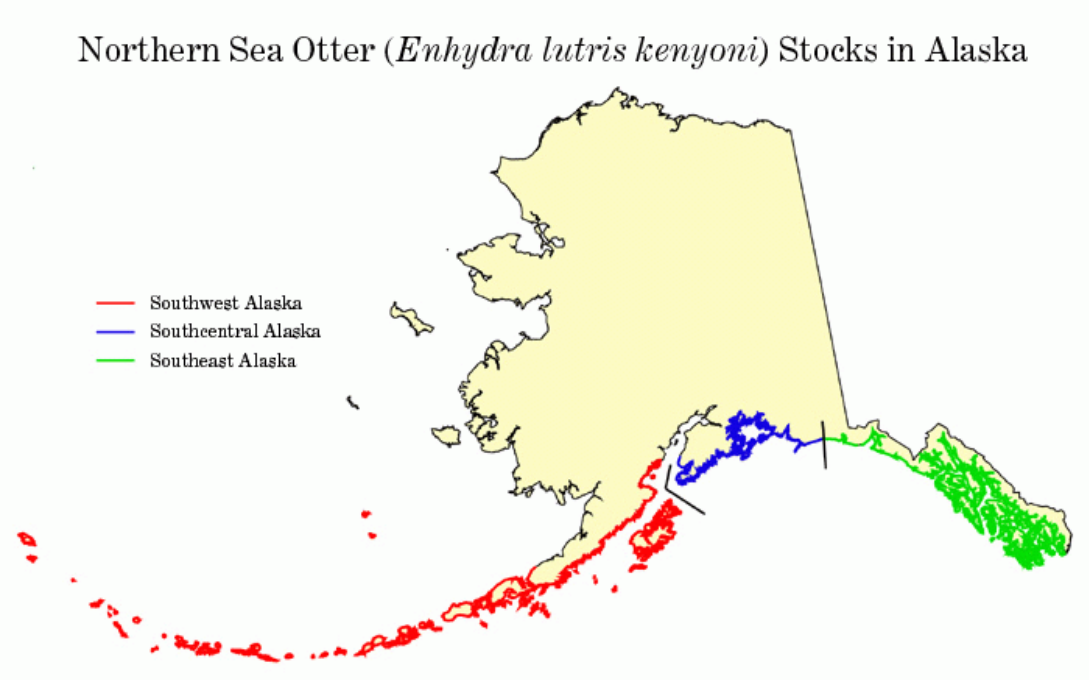
Appendix B: Critical Habitat for USFWS species



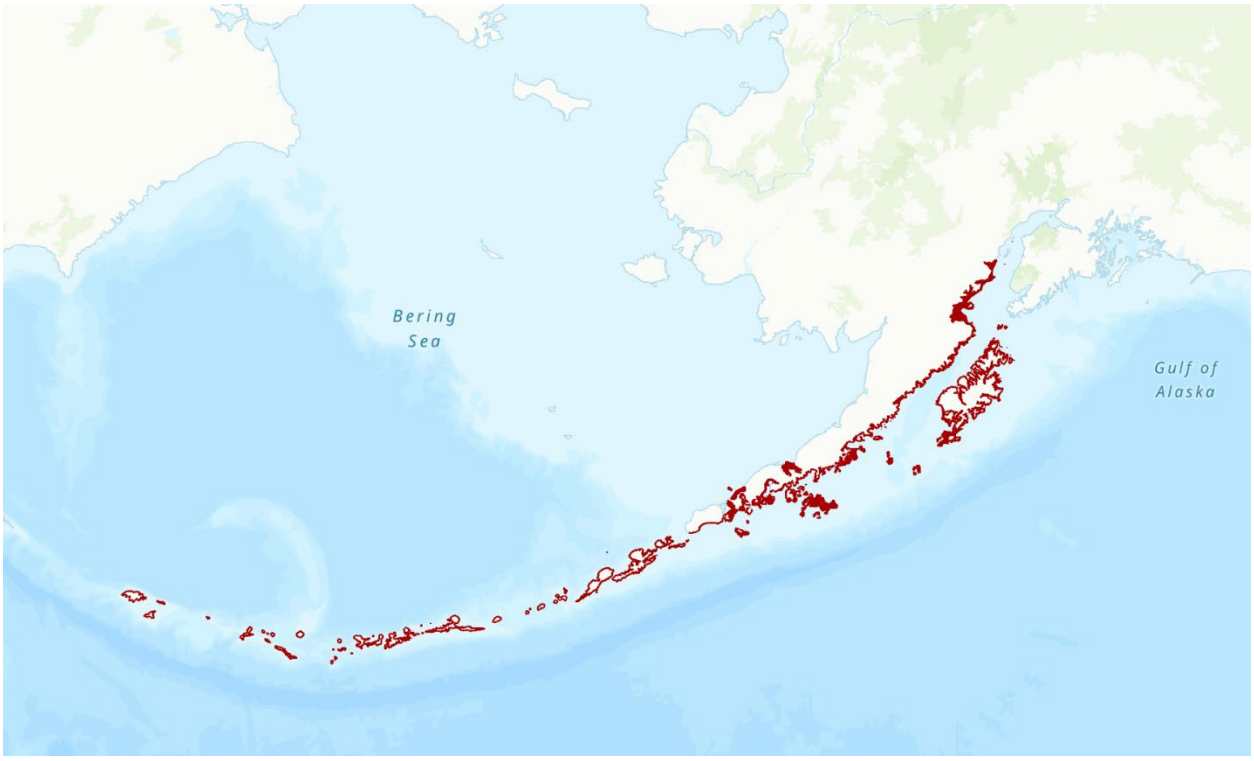
Steller Eider Critical Habitat



Spectacled Eider Critical Habitat

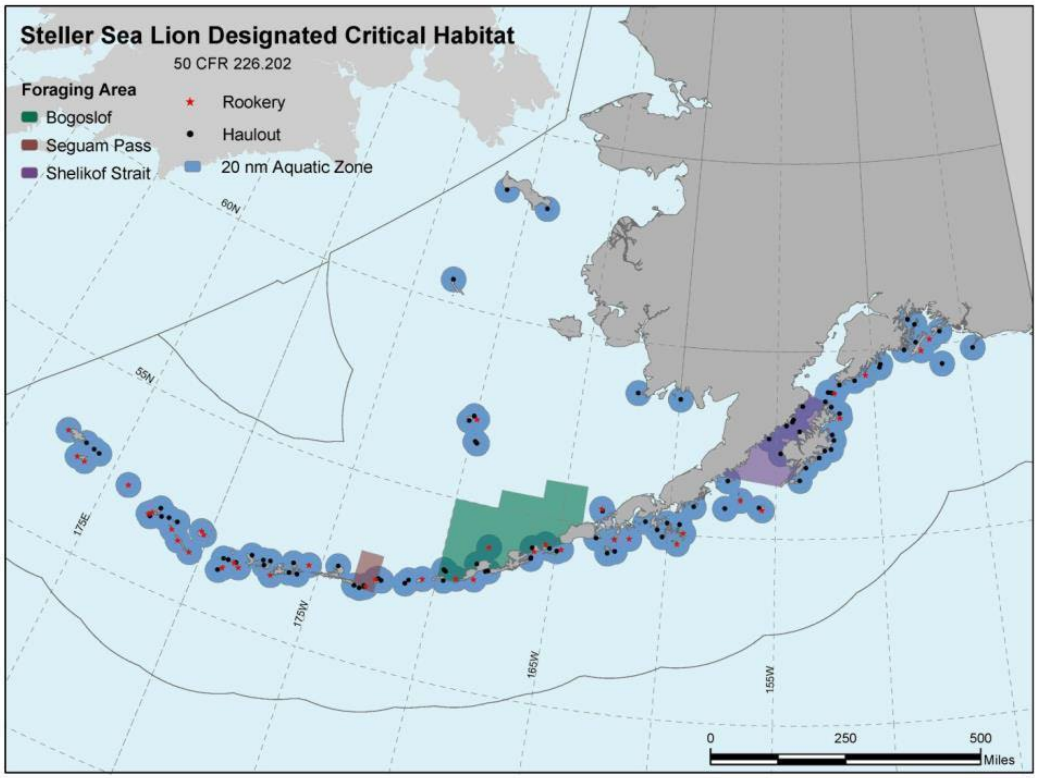


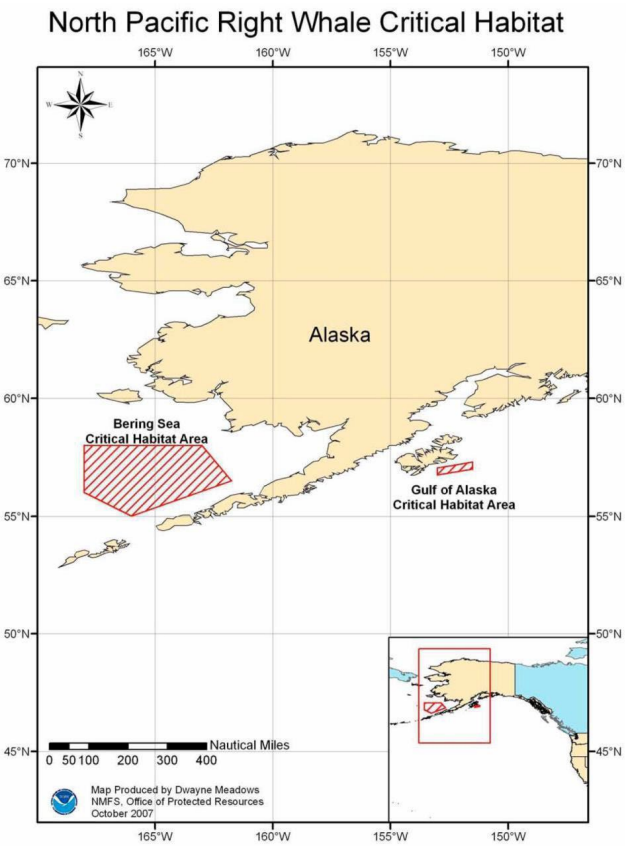
Sea Otters are protected under MMPA. Southwest DPS is threatened under ESA

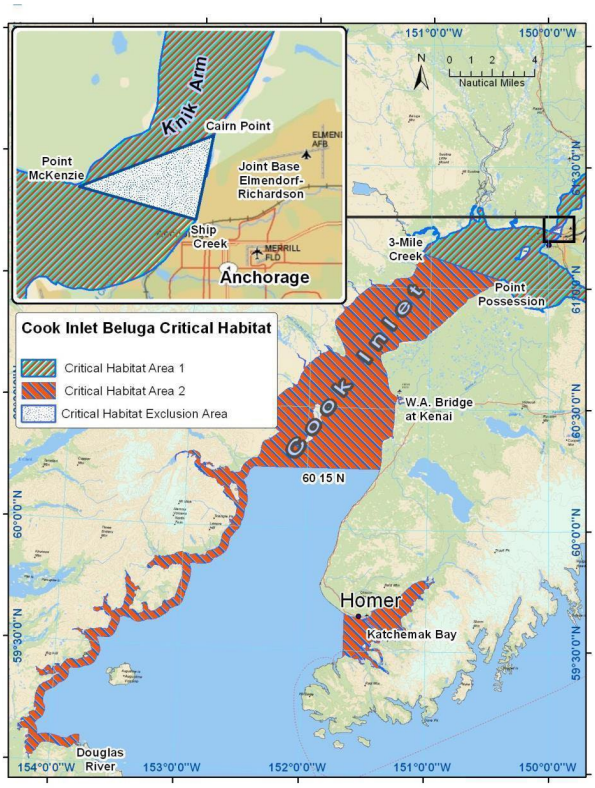


NSO critical habitat

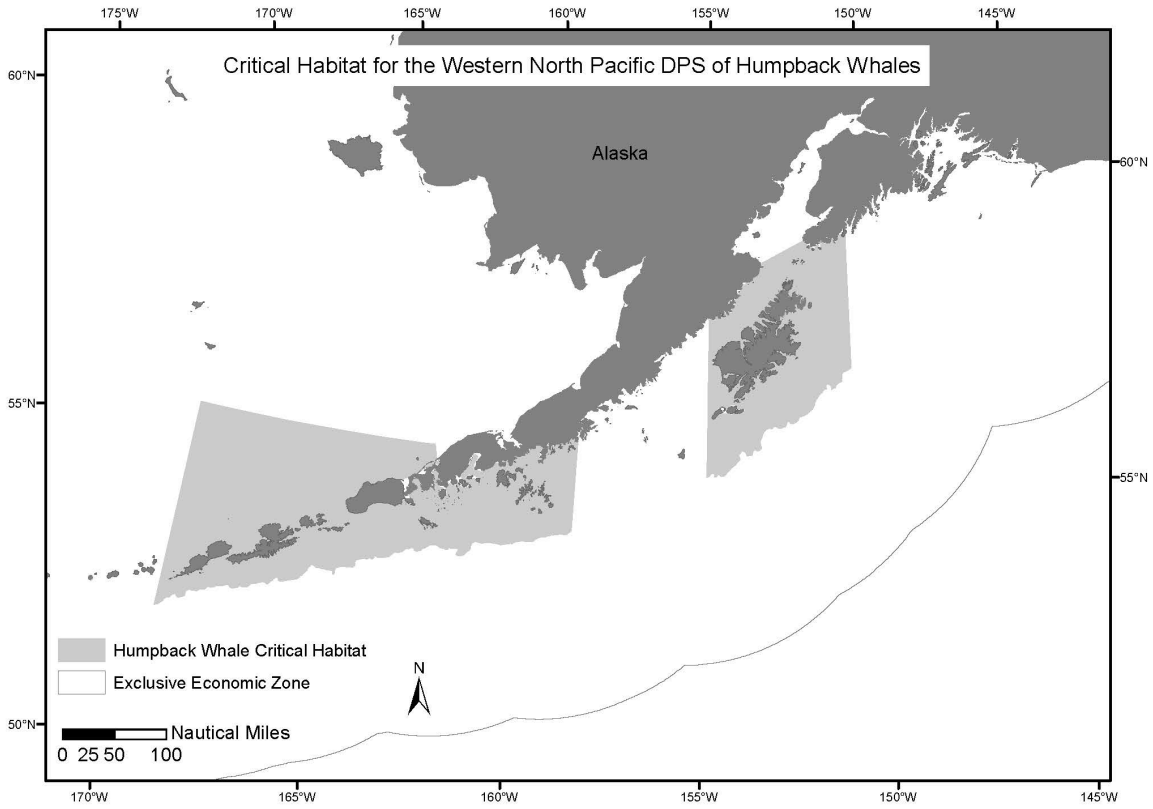
Appendix C: Critical Habitat for NMFS species



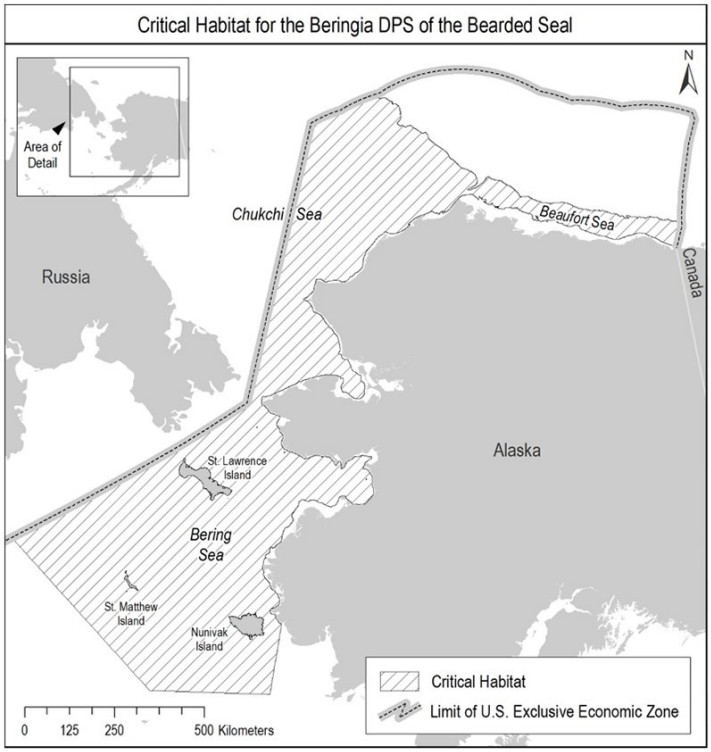


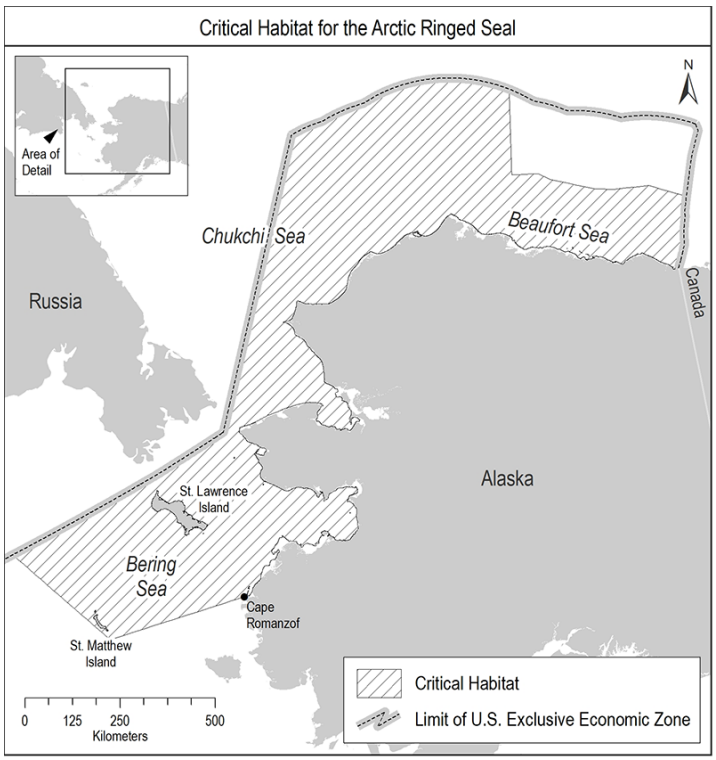


Humpback Whale Critical Habitat in Alaska



Bearded and Ringed Seal Critical Habitat





Appendix D: Level A and B takes

Species		Authorized Take			
		M/SI+ Level A			Level B
		Trawl	Longline	Gillnet	
North Pacific right whale					2
Bowhead whale					42
Gray whale					5,579
Humpback whale	CNP				161
	WNP				6
Minke whale					8
Sei whale					2
Fin whale					40
Blue whale					1
Sperm whale (ESA)			2		22
Cuvier's beaked whale					2
Baird's beaked whale					8
Stejneger's beaked whale					15
Beluga whale	Beufort Sea	1			3
	Eastern Chukchi Sea	1			3
	Eastern Bering Sea				939
	Cook Inlet				3
Bottlenose dolphin	Offshore		1		
Common dolphin			1		
Pacific white-sided dolphin		5		1	54
Risso's dolphin			1		

Killer whale	Offshore				67
	West Coast Transient				13
	AT1 Transient				2
	GOA/BSAI Transient				14
	Northern Resident				6
	Alaska Resident		2		24
Short-finned pilot whale			1		
Harbor porpoise	SE Alaska	1		1	358
	Gulf of Alaska	1		1	650
	Bering Sea	1			1,746
Dall's porpoise	CA/OR/WA				
	Alaska Resident	10		1	5,343
Northern fur seal	Eastern Pacific	10		1	1,576
	California	1		1	143
Species		Authorized Take			
		M/SI+ Level A			Level B
		Trawl	Longline	Gillnet	
California sea lion			1		
Steller sea lion	Eastern	5		1	914
	Western (ESA)	10 (5 GOA/5 BSAI)	8 (5 IPHC, 1	1 (1 GOA)	3,526

			GOA, 1 BSAI)		
Bearded seal (ESA)		2 (1 BSAI, 1 CSBS)			1,727
Harbor seal	California		5		
	OR/WA Coast				
	Washington Inland Waters				
	Clarence Strait	1			242
	Dixon/Cape Decision	1			153
	Sitka/Chatham Strait	1		1	965
	Lynn Canal/Stephens Passage	1			109
	Glacier Bay/Icy Strait	1			69
	Cook Inlet/Shelikof Strait	1			2,622
	Prince William Sound	1		1	3,194
	South Kodiak	1			3,809
	North Kodiak	1			906
	Bristol Bay	1			187

	Pribilof Islands	1			29
	Aleutian Islands	1			301
Spotted seal		2	1		2,106
Ringed seal (ESA)		2 (1 BSAI, 1 CSBS)	2 (1 BSAI, 1 IPHC)		2,066
Ribbon seal		2			1,404
Northern elephant seal		1			52
Unidentified cetacean		2		1	
Unidentified pinniped		3	3		

Appendix C

AFSC Communications Plan

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INTRODUCTION

Compliance with both the Marine Mammal Protection Act (MMPA) and the National Environmental Policy Act (NEPA) requires that potential effects to subsistence activities are considered and expectations for communicating and coordinating with subsistence users are met. In authorizing incidental take of marine mammals, the MMPA requires that there is no unmitigable adverse impact on the availability of marine mammal species or stocks for subsistence uses, and that requirements pertaining to mitigation and monitoring are addressed. In practice, fulfillment of these requirements has resulted in the implementation of a variety of differing approaches to mitigation, monitoring, and consultation measures by agencies, corporations, industry, and other entities. The Alaska Fisheries Science Center (AFSC) request for rulemaking, subsequent Letter of Authorization (LOA), and accompanying Draft Programmatic Environmental Assessment (DPEA) provide the appropriate analysis and materials necessary to fulfill MMPA and NEPA requirements.

Section 12 of the LOA application states:

> "Where the proposed activity would take place in or near a traditional arctic subsistence hunting area and/or may affect the availability of a species or stock of marine mammal for Arctic subsistence use, the applicant must submit either a "Plan of Cooperation (POC)" or information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence use."

The AFSC has determined through analysis in the DPEA/LOA that various activities of its fisheries research and assessment programs in the Arctic waters of Alaska may occur in areas utilized for traditional subsistence activities and submits this Communication Plan as an integral component under section 12 of its application for a LOA.

According to 50CFR subpart I, 216.103: "Arctic waters means the marine and estuarine waters north of 60°N latitude." Correspondingly the AFSC is planning to implement a suite of actions and activities to address the potential nexus between AFSC fisheries and ecosystem research and Arctic subsistence activities. In addition, the AFSC has taken a more expansive view of the requirements for the purpose of this Communication Plan because of the potential for interaction between some of the proposed fisheries research activities, the ranges of important marine mammal species (some of which are listed as "endangered" or "threatened" pursuant to the Endangered Species Act [ESA]), and traditional subsistence activities of Alaska Native communities situated at the intersection of those activities, research areas, and animal ranges that may extend into areas to the south of the "Arctic" as defined above. Therefore, while most of the activities considered by this plan are focused on the Arctic, the AFSC may take additional steps to expand communication and mitigation procedures throughout the greater region addressed by the accompanying LOA application (see text below, Figures B-1 and B-2).

DESCRIPTION OF PROPOSED ACTION

Recognizing that AFSC fisheries research activities and subsistence use patterns differ in various regions of Alaska (in both the species pursued and the timing of harvest), the analysis of overlap between AFSC fisheries research and subsistence activities has been divided into three geographic regions (Figure B-1): the Gulf of Alaska (from Dixon Entrance north and west to Unimak Pass, the Bering Sea/Aleutian Islands (west of Unimak to Attu, north and south of the chain, and north into the Bering Sea to the Bering Strait) in Bering Shelf waters), and the Chukchi Sea/Beaufort Sea region (Bering Strait north to Barrow and east to Demarcation Point). A detailed description of the specific fisheries research activities proposed to be conducted is provided in LOA Table 1-1 and Appendix A; additional materials are provided in Section 4.3 of the DPEA. Figure B-2 depicts in a generic way the vast array of AFSC fisheries research activities that have been conducted or are proposed throughout the year at scattered regions and locations throughout the AFSC research areas. Figure B-3 is an Arctic Waterways Safety Committee graphic which

identifies proposed buffer zones of 30 nautical miles from Arctic coastal communities or at a distance of 10 nautical miles from the rest of the Arctic coastline. While this figure provides additional information informing readers about areas of potential overlap between subsistence activities and research, it is not fully inclusive of all areas within the 60°N region discussed above, nor does it address those regions and activities to the south of 60°N. The reader is also referred to Section 3.3.4 of the DPEA for a more detailed discussion of the patterns of subsistence use in those areas that may overlap with fisheries research activities. Considering these figures together provides an overview of how fisheries research and subsistence activities might overlap in space and time and why it is important to craft this Communication Plan so as to develop a process and to identify the steps that will be taken to mitigate any adverse effects on the availability of marine mammals for subsistence uses.

Communication Plan - Phase 1: Initial Outreach Activities

As part of the environmental review process for this LOA application, the AFSC contacted over 140 Alaska Native community leaders (including federally recognized tribal governments and corporations) by letters in September and October 2013 (examples attached to the end of this document as Figure B-4). The purpose of this correspondence was to alert these stakeholders to the onset of the programmatic review process and to solicit their questions and input. One response was received from a non-profit Native organization seeking clarification on the process. In 2015-2016 the AFSC joined in meetings with the Arctic Waterways Safety Committee (AWSC) as an active participant in discussions intended to establish written procedures for enhancing communication between Alaska Native subsistence communities with federal research cruise operations in the northern waters of the Bering Sea and throughout the Alaskan Arctic. These discussions are continuing to evolve as this application is being submitted. AWSC is no longer active, so this forum is no longer used by AFSC to provide updates to Indigenous communities regarding planning research activities.

AFSC has a history of reaching out to communicate and to coordinate with Alaska Native organizations and subsistence communities as a regular part of their fisheries and marine mammal research throughout coastal and maritime Alaska. For example, AFSC scientists Drs. Duane Stevenson (northern Bering Sea bottom trawl survey), Sara Wise and Libby Logerwell (Arctic Integrated Research Assessment and related surveys) and Suzanne McDermott (Atka mackerel and Pacific cod studies in the Aleutians) and their industry and academic partners have routinely sent out advance notice of pending projects to study area subsistence communities. These notices contain a description of study design, areas of operation, anticipated dates of arrival and departure, and persons to contact for more information. T hese scientists and their industry and academic partners have routinely met with subsistence hunters and fishers in local communities such as Barrow, Kotebue, Nome, St. Lawrence Island, and Unalaska to report on the results of this research and to solicit input for planning future research. With respect to marine mammal research, staff at the AFSC's Marine Mammal Laboratory (MML) have decades-long history of cooperation with Alaska Native hunters and residents in many remote communities throughout the State. It is standard practice for AFSC scientists studying bowhead whales, beluga whales, ice seals, northern fur seals, Steller sea lions, harbor seas and other species to develop and to conduct research projects collaboratively and cooperatively through advance meetings in communities and with hunter organizations and co-management partners. Typically, these scientists meet either in person or via teleconference with local contacts during winter months to report on the results of previously conducted projects. These extensive, long established formal and informal working relationships are expected to continue and are anticipated to be expanded as part of this Communication Plan.

Communication Plan - Phase 2: Annual Implementation Activities

Development of an annual process for establishing a formalized communication plan is a key goal of this Plan. AFSC has developed and implemented a Communications Protocol that details the process (pre, during and post research operations) that AFSC scientists must undertake to engage with communities to

ensure that research activities do not interfere with subsistence hunting, sealing and fishing activities. AFSC is committed to working to ensure there will be direct communication and coordination between AFSC principal investigators (PIs) and local and regional inhabitants and representatives in those areas where AFSC fisheries research will take place, including advance notice and planning, in-season and on-site communication, and post-season follow-up.

Part 1: Winter - Preliminary Field Season Communication and Planning

Arctic Regions: Working through the Interagency Arctic Research Policy Committee (IARPC) AFSC scientists provide information on annual survey operations. IARPC Collaborations brings together federal agencies, Arctic researchers and communities, and more to share their work and team up to improve research in the Arctic. As best as possible, AFSC staff outline the planned fisheries research activities proposed for the upcoming Arctic field season. As federal budget allocations and other funding determinations are often not complete at this time of year, the briefing provides a "best guess" as to the type, timing and distribution of AFSC research likely to be carried out in the coming field season. After the field season, IARPC hosts a meeting where researchers operating in the Arctic, including AFSC scientists, provide preliminary findings.

Other regions outside of the Arctic: The AFSC communicates to the public and its partners when upcoming surveys and major cruises begin, about the need and nature for the survey, and more and more often news about the cruise as it occurs. These scientific activities typically have a formal cruise announcement that is sent to interested parties and that is also released to news media throughout Alaska. The AFSC Center Director will encourage PI's from all AFSC fisheries research activities outside of the Arctic to continue and/or to expand coordination on an informal basis with local Alaska Native Organizations and subsistence hunters and fishers at local and regional levels in the northern Bering Sea, Aleutian Archipelago, Alaskan Peninsula, Bristol Bay, and southeastern Alaska. It is desirable for this communication to follow the same "advance notice and planning, in-season and on-site communication, and post-season follow-up" model as described above for the Arctic regions. It is expected that the collaborative process now followed by some AFSC fisheries research and most marine mammal scientists at the AFSC will be implemented and, if possible, expanded so as to increase knowledge of local customs, hunting and fishing areas, the nature and benefits of AFSC fisheries research, and to collaboratively minimize potential interactions between fisheries research and subsistence activities in these project areas.

Part 2: Early Spring - Communication of Planned Operational Procedures and Actions

As operational budgets for the upcoming field season become known and the actual research activities to be conducted are determined, AFSC project leaders will begin alerting appropriate regional representatives, communities, and hunters as to the timing and specifics of each project and will again seek input on best practices for avoiding interactions. PIs will be required to provide a field operations or cruise plan (see below) to the AFSC Director detailing field operations and a schedule for communicating with selected key communities about the upcoming research. Plans will describe the process for working with communities so as to avoid interactions between research and subsistence activities; avenues for obtaining and incorporating local input will be identified.

It is anticipated that such pre-season communication may also include on-site or teleconference meetings in late winter/early spring preceding the upcoming field season covered by the LOA/regulations in the key communities. For the purposes of this LOA application Communication Plan, this includes Tribal Governments and key organizations in the Arctic include the Alaska Eskimo Whaling Commission, Ice Seal Committee, Harbor Seal Commission, and Alaska Beluga Whale Committee as well as a number of regional non-profit organizations, Alaska Native Corporations, and Borough agencies. The AFSC notes that additional meetings are likely to occur on a project by project basis whenever operations find

themselves in ports and regional subsistence hubs. Staff will be encouraged to seek out the means to make public service announcements via radio (e.g., via KNOM, KBRW and KOTZ, ARCS airwaves) and various internet portals.

Part 3: Field Season

A) Prior to departure for the field (going to sea):

AFSC PIs will prepare field operations or cruise plans for each project and submit them to the AFSC Director for approval. One section of these plans will address how researchers will consult and maintain communication with contacts in the affected subsistence communities when in the field (at sea). The intent will be to provide advance notice of operations and to seek information and guidance on how to avoid interactions with subsistence activities as teams approach communities and subsistence areas. Each field operations plan should include a list of local contacts and contact mechanisms such as phone numbers, email, and radio frequencies monitored (e.g., Kaktovik Call Center).

B) Real time operational procedures and actions

Field operations or cruise plans will outline steps that will be taken to avoid or to minimize the risk of interactions between AFSC fisheries research and local subsistence activities. PIs will provide a one to two-page summary description of the proposed conflict avoidance/mitigation measures that will be implemented to reduce conflicts with a) marine mammals and b) subsistence activities. These should identify responses to evolving situations through specific operational procedures ("what if, then?" scenarios) designed to avoid or minimize interaction between research and subsistence activities in time and space. AFSC will evaluate the potential for including regionally appropriate subsistence communicators/marine mammal observers on cruises subject to available space and appropriate duration on a case by case basis.

Part 4: Fall - Post Field Season and Subsequent Follow-up

AFSC and individual PIs will schedule post-season informational sessions with subsistence contacts from the study areas: (1) to brief them on the outcome of the AFSC fisheries research and (2) to assess how well this Communication Plan and individual field operations or cruise plans worked to minimize interactions. Incorporating a synopsis of AFSC fisheries research activities in the fall through IARPC and via presentations to the AEWC. AFSC PIs will be encouraged to also set up meetings via travel, video conference, and/or internet applications to further increase direct communication with subsistence hunters and fishers in applicable remote Alaska communities.

Communication Plan - Phase 3: Review and Preparation for Subsequent LOAs

In year four of the five-year MMPA authorization, AFSC Leadership will solicit input from PIs to determine how this Communication Plan worked to avoid interactions between fisheries research and subsistence activities. This information will be incorporated in a timely manner into a new application for subsequent MMPA regulations and LOAs.

Conclusion:

As required by regulation (§ 216.104(a)(11)), through this Communication Plan the AFSC:

- Will notify and provide the affected Alaska Native subsistence community with a draft of this Communication Plan through a series of mailings, direct contacts, and planned meetings throughout the regions where AFSC fisheries research is expected to occur over the next five years. A notice of availability of the LOA application and the draft Communication Plan will be

published in the Federal Register; a public comment period will be included as part of the regular review process;

- Has outlined a proposed schedule and a strategy for meeting with the affected subsistence communities to discuss proposed activities and to resolve potential conflicts regarding any aspects of either the fisheries research operations or the Communication Plan;
- Described in this Communication Plan and the accompanying LOA application those measures and procedures the AFSC will take to ensure that proposed activities will not interfere with subsistence whaling or sealing; and,
- Has detailed the plans the AFSC has proposed to ensure continued cooperation and collaboration with communities in those regions where AFSC fisheries research activities will occur, both prior to, while conducting the activity, and subsequent to the activities, so as to resolve potential conflicts and to keep these communities aware of any changes in the operations and share survey results.

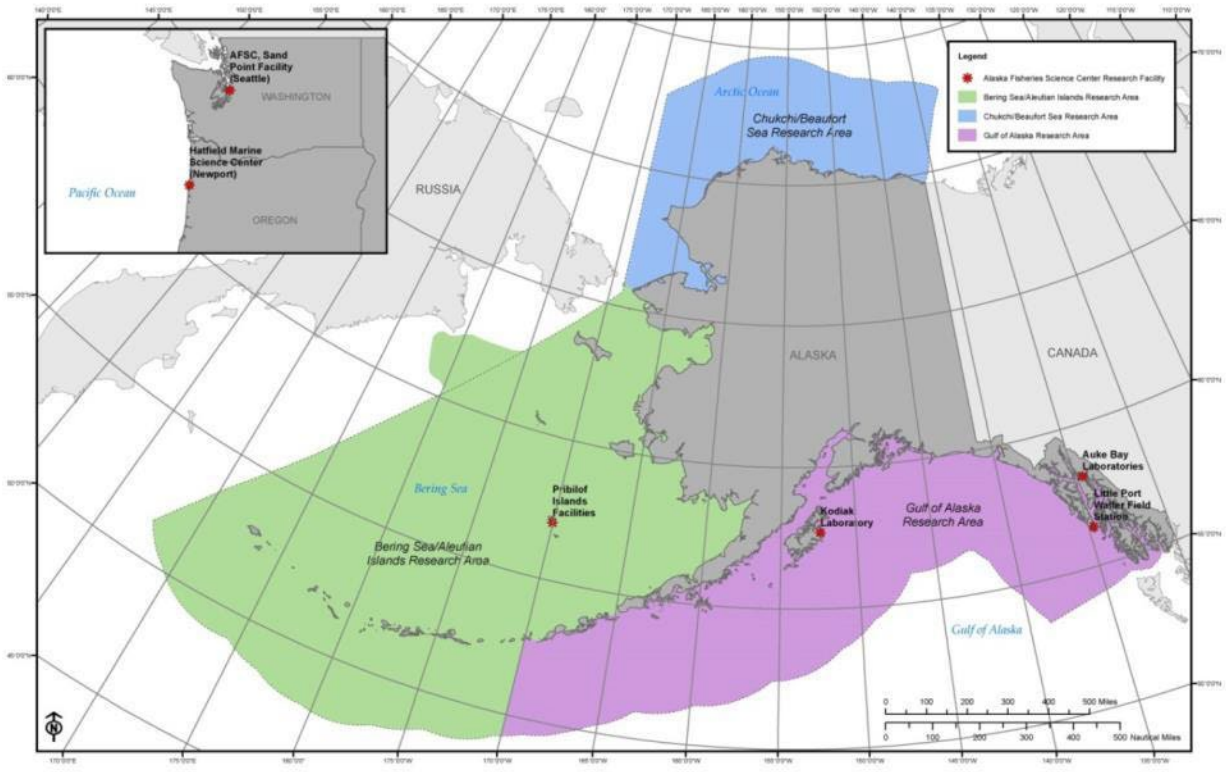

Figure B-1 AFSC fisheries research areas

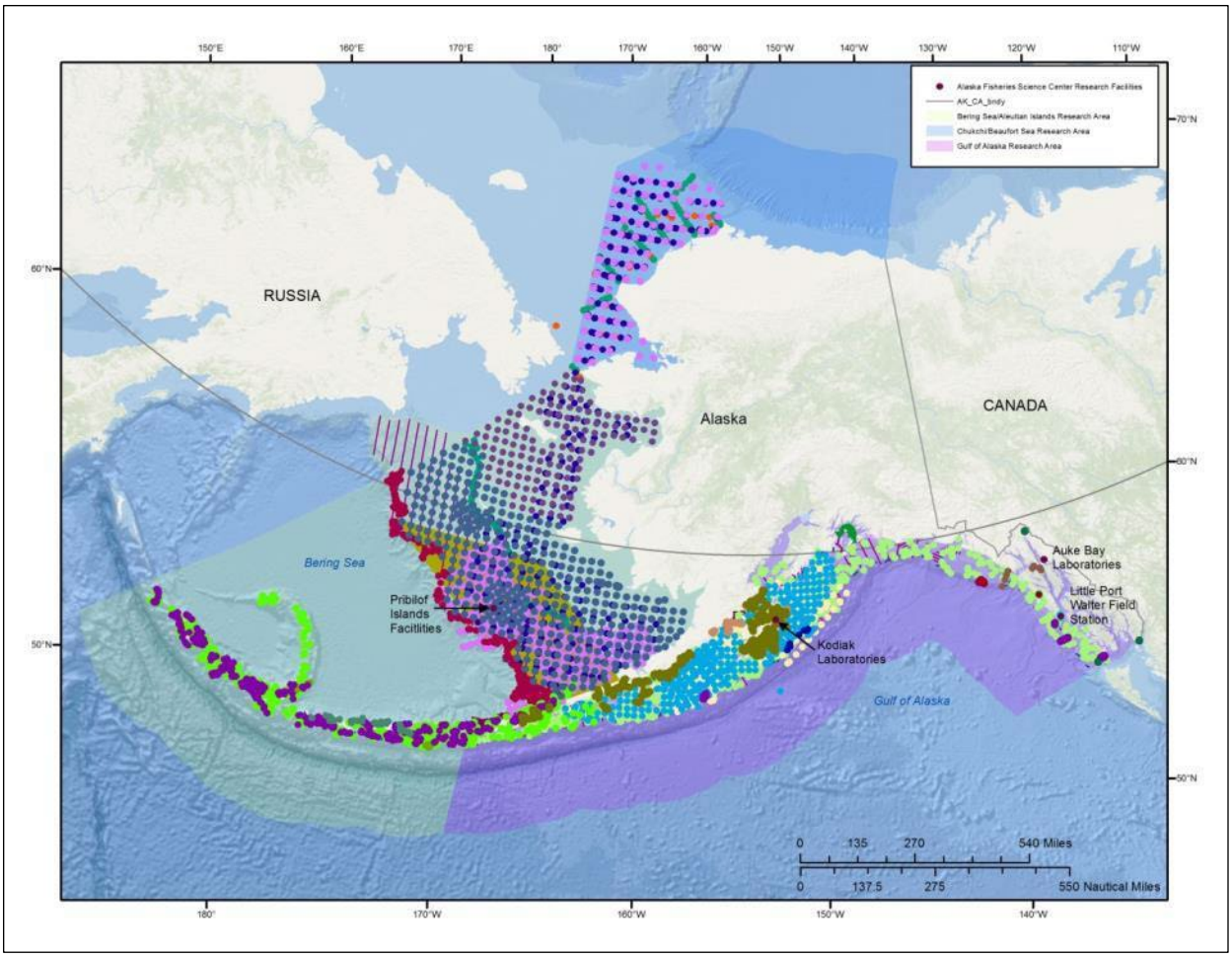

Figure B-2 Overview of the spatial distribution of AFSC fisheries research project sampling regions and locations as identified under the proposed action. See Appendix B of the DPEA for more detailed figures and information concerning sampling effort for specific research activities, organized by season and research area.

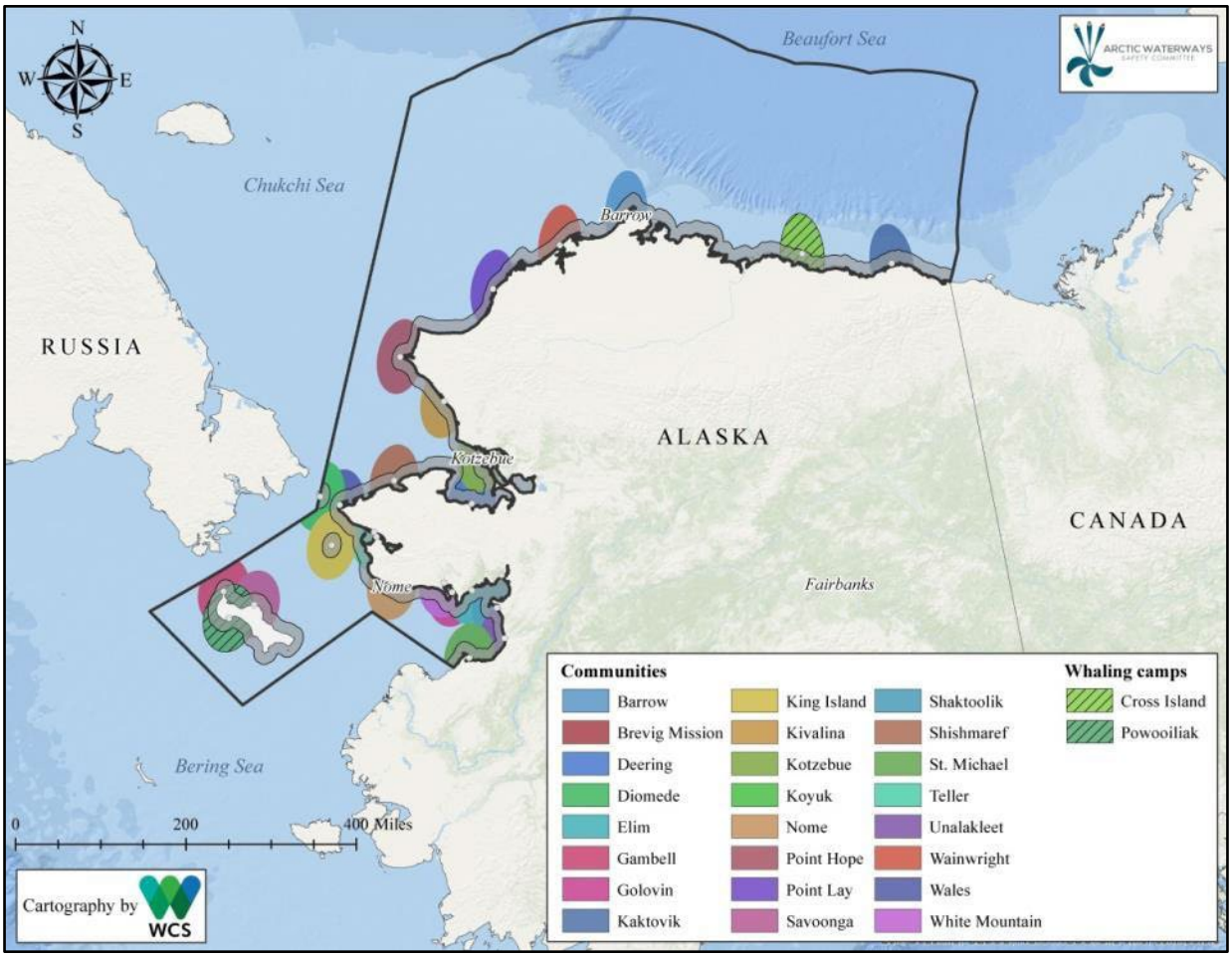

Figure B-3 Arctic Waterways Safety Committee graphic which identifies regions of distance 30 nautical miles from coastal villages (colored ovals) or at a distance of 10 nautical miles from the rest of the Arctic coastline (gray shaded areas). The black line defines the boundary of the area of concern for the Arctic Waterways Safety Committee.

Figure B-4 Letters sent to Alaska Native organizations and communities in 2013;

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Alaska Fisheries Science Center
7600 Sand Point Way N.E.
Bldg. 4, F/AKC
Seattle, Washington 98115-0070

6 September 2013

President Phyllis Amodo
Kaguyak Village
P.O. Box 5078
Akhiok, AK 99615

Re: Evaluation of Potential Impacts of Fisheries Research Activities Conducted by NMFS' Alaska Fisheries Science Center on Subsistence Resources and Activities

Dear President Amodo:

The National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NMFS) is undertaking a programmatic review of its fisheries research programs to ensure the potential impacts of these activities are assessed in compliance with applicable laws. The NMFS Alaska Fisheries Science Center (AFSC) conducts research on living marine resources in the coastal oceans off Alaska to provide scientific advice to support the North Pacific Fishery Management Council and other domestic and international fisheries management organizations. We want to take this opportunity to inform you of the processes being undertaken to complete this programmatic review relative to Alaska Native communities.

We are in the process of developing a draft programmatic Environmental Assessment (EA) for public review that will describe proposed research activities, historic catch of species targeted by fisheries research, and potential direct and cumulative effects of AFSC research on the affected environment. Initiation of this National Environmental Policy Act (NEPA) review will provide a basis to evaluate the potential impacts of these activities on subsistence activities and resources, maritime historic sites or areas of cultural significance under the National Historic Preservation Act, species listed under the Endangered Species Act, designated critical habitat, and on essential fish habitat under the Magnuson-Stevens Act. The programmatic EA will also be used as the basis to prepare an Incidental Take Authorization (ITA) application to take marine mammals under the Marine Mammal Protection Act incidental to proposed research activities.

Since AFSC research cruises have only limited operations in areas used by native communities, the AFSC expects insignificant impacts on subsistence harvest of marine mammals or other subsistence activities. To date, the AFSC is not aware that any of its fisheries research surveys have encountered or interfered with any subsistence hunts or activities. The AFSC will evaluate measures to mitigate potential impacts, including advanced notification of and communication during conduct of fisheries research activities.

As we prepare the programmatic EA, the AFSC will be conducting a spatial analysis of potential future overlaps between subsistence harvesting and research activities, as well as identify any maritime historic or culturally significant sites that may be affected. Moreover, the AFSC would like to have an open exchange of information with affected federal entities and the Alaska Native community about the AFSC's fishery research activities and will make every effort to proactively collaborate and communicate with interested Alaska Native organizations, co-management groups, Native villages and other groups during the development of the AFSC's programmatic EA.

The Kaguyak Village can provide valuable assistance by identifying any additional subsistence use areas that may overlap with AFSC fisheries research activities in time and space. In addition, if you have any other concerns about the AFSC fisheries research efforts and its impacts on specific maritime historic or culturally significant sites in your area that should be addressed in the programmatic EA, we welcome your input. You may also wait for the public comment period to formally participate in development of this EA, which is likely to be available in mid-2014.

If you have any questions, comments, and/or concerns regarding the development of this EA, please feel free to contact the following individuals on my staff: Dr. Daniel Ito (206-526-4232, Dan.Ito@noaa.gov) or Guy Fleischer (206-526-4103, Guy.Fleischer@noaa.gov).

Sincerely,

Douglas DeMaster, Ph.D.
Science and Research Director

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Alaska Fisheries Science Center
7600 Sand Point Way N.E.
Bldg. 4, F/AKC
Seattle, Washington 98115-0070

28 October 2013

President George Edwardson
Inupiat Community of the Arctic Slope
P.O. Box 934
Barrow, AK 99723

Re: Evaluation of Potential Impacts of Fisheries Research Activities Conducted by NMFS' Alaska Fisheries Science Center on Subsistence Resources and Activities

Dear President Edwardson:

The National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NMFS) is undertaking a programmatic review of its fisheries research programs to ensure the potential impacts of these activities are assessed in compliance with applicable laws. The NMFS Alaska Fisheries Science Center (AFSC) conducts research on living marine resources in the coastal oceans off Alaska to provide scientific advice to support the North Pacific Fishery Management Council and other domestic and international fisheries management organizations. We want to take this opportunity to inform you of the processes being undertaken to complete this programmatic review relative to Alaska Native communities.

We are in the process of developing a draft programmatic Environmental Assessment (EA) for public review that will describe proposed research activities, historic catch of species targeted by fisheries research, and potential direct and cumulative effects of AFSC research on the affected environment. Initiation of this National Environmental Policy Act (NEPA) review will provide a basis to evaluate the potential impacts of these activities on subsistence activities and resources, maritime historic sites or areas of cultural significance under the National Historic Preservation Act, species listed under the Endangered Species Act, designated critical habitat, and on essential fish habitat under the Magnuson-Stevens Act. The programmatic EA will also be used as the basis to prepare an Incidental Take Authorization (ITA) application to take marine mammals under the Marine Mammal Protection Act incidental to proposed research activities.

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As we prepare the programmatic EA, the AFSC will be conducting a spatial analysis of potential future overlaps between subsistence harvesting and research activities, as well as identify any maritime historic

or culturally significant sites that may be affected. Moreover, the AFSC would like to have an open exchange of information with affected federal entities and the Alaska Native community about the AFSC's fishery research activities and will make every effort to proactively collaborate and communicate with interested Alaska Native organizations, co-management groups, Native villages and other groups during the development of the AFSC's programmatic EA.

NMFS is contacting federally-recognized tribal governments in the coastal areas potentially affected by our research to assist in identifying any additional subsistence use areas that may overlap with AFSC fisheries research activities in time and space. In addition, Inupiat Community of the Arctic Slope can provide valuable assistance by identifying any concerns about the AFSC fisheries research efforts and its impacts on specific maritime historic or culturally significant sites in your area that should be addressed in the programmatic EA, we welcome your input. You may also wait for the public comment period to formally participate in development of this EA, which is likely to be available in mid-2014.

If you have any questions, comments, and/or concerns regarding the development of this EA, please feel free to contact the following individuals on my staff: Dr. Daniel Ito (206-526-4232, Dan.Ito@noaa.gov) or Guy Fleischer (206-526-4103, Guy.Fleischer@noaa.gov).

Sincerely,

Douglas DeMaster, Ph.D.
Science and Research Director

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