NOAA FISHERIES

Ice Seal Recovery Planning Workshop

Summary Report

January 24-25, 2025

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List of Abbreviations and Acronyms

ADFG - Alaska Department of Fish and Game

AFSC - Alaska Fisheries Science Center

AIS - Automatic Identification System

AKRO - Alaska Regional Office

BIA - Biologically Important Area

BP - British Petroleum

DPS - Distinct Population Segment

ESA - Endangered Species Act

IPCOMM - Indigenous Peoples Council for Marine Mammals

ISC - Ice Seal Committee

MMPA - Marine Mammal Protection Act

NGO - Non-Governmental Organization

NMFS - National Marine Fisheries Service

NOAA - National Oceanic and Atmospheric Administration

PIRO - Pacific Islands Regional Office

PRD - Protected Resources Division

UME - Unusual Mortality Event

U.S. - United States

Purpose and Overview

The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NOAA Fisheries) Alaska Regional Office (AKRO) Protected Resources Division (PRD) hosted a workshop to gather information and listen to perspectives on how to recover and delist the Beringia distinct population segment (DPS) of bearded seal (*Erignathus barbatus nauticus*), hereafter referred to as bearded seals, and the Arctic subspecies of ringed seal (*Pusa hispida hispida*), hereafter referred to as ringed seals. Bearded and ringed seals were listed as threatened until the Endangered Species Act (ESA) in 2012. Section 4(f) of the ESA directs NOAA Fisheries to develop and implement recovery plans for threatened and endangered species. The workshop was held January 23–24, 2025, at the BP Energy Center in Anchorage, Alaska and included a virtual component. Participants included invited attendees and was also open to interested members of the public (see Participants section for a complete list). Our co-management partner, the Ice Seal Committee (ISC), had their full Board of Commissioners in attendance. The ISC and NOAA Fisheries have a cooperative agreement under section 119 of the Marine Mammal Protection Act (MMPA) for co-managing subsistence use of ice seals, and the ISC will play an integral role in the recovery planning process.

Recovery of a species is considered to be the point where protections under the ESA are no longer needed. The ESA mandates that recovery plans be developed and implemented for the conservation and survival of ESA-listed species. Recovery plans are not solely to guide recovery actions taken by NOAA Fisheries; rather, they are meant to guide recovery actions of all parties who may be involved or interested in conserving and recovering a species. Recovery plans also typically identify critical research gaps that need to be filled in order to inform management actions toward delisting the species. As a MMPA section 119 cooperative agreement partner (aka co-management partner), ISC has an integral role in the recovery planning process.

The recovery planning workshop was designed to bring participants together to obtain informed and creative input into the recovery components (see below) required for bearded and ringed seals (also collectively referred to as ice seals[1] in this document). NOAA Fisheries will use this information to help make decisions about potential recovery actions and criteria for these species. Although this workshop summary is inclusive of the conversations at the workshop, the Bearded Seal Recovery Plan and the Ringed Seal Recovery Plan may not reflect all of the ideas raised during the workshop. NOAA Fisheries will seek peer review and public comment on the draft recovery plans.

The workshop was not a consensus-seeking meeting; rather, participants were asked to provide their professional or personal opinion as it related to threats to or recovery of bearded seals and ringed seals. Therefore, it should be emphasized that the recommendations in this report, listed below, are not the consensus opinion of NOAA Fisheries or the group of participants as a

[1] There are four species of ice-associated seals in Alaska. In addition to the Beringia DPS bearded and Arctic ringed seals, there are also ribbon seals and spotted seals. Only bearded and ringed seals are listed under the ESA.

whole. Many recommendations represent the opinion of just one or a few participants. Experts from a range of relevant disciplines were invited to participate in the workshop and included the following topic areas: climate science, biology, life history, ecology, health and disease, Indigenous Knowledge, subsistence use, commercial industries, federal and state resource management, and recovery planning (see Table 1). The workshop was open to the public (90 FR 1966; January 10, 2025) and public comment was invited at the end of each day.

After a series of presentations to provide context for recovery plans, an overview of bearded and ringed seal biology, and the major threats to these species, the workshop focused on the following objectives:

- Provide input on and brainstorm potential recovery criteria to delist bearded seals and ringed seals;
- Discuss and brainstorm potential recovery actions to reduce and/or ameliorate threats to the species; and
- Discuss and brainstorm prioritization of the most effective potential recovery actions for the species.

This workshop summary is presented in six main sections: Purpose and Overview, Schedule, Participants, Recovery Criteria Discussion, Recovery Actions Discussion, and Next Steps.

While recovery plans themselves are not regulatory, there are statutory elements that must be included in a plan. NOAA Fisheries is preparing recovery outlines which present a preliminary recovery strategy and actions to direct a listed species' recovery efforts until a recovery plan is completed. For development of the recovery plans, we will be using a three-part framework approach. This process captures recovery planning information in three documents (described below). Information and feedback from this workshop will help inform the recovery components (Recovery Plan and Recovery Implementation Strategy) for bearded seals and ringed seals.

The components for the ice seal recovery documents will consist of the following:

Recovery Status Review: The first document will summarize the species' current and future status and assess threats. Traditionally this information was included in the background of a recovery plan but often became outdated quickly. The process of revising a recovery plan makes it difficult to keep this information up-to-date and useful for resource managers. By keeping the background separate from the recovery plan (which includes the recovery strategy, criteria, actions, and time and cost estimates) and up-to-date, information can be kept more relevant and used to inform a variety of recovery activities including ESA section 7 analyses, ESA 5-year reviews of the status of the species, and conservation plans developed under section 10 of the ESA.

Recovery Plan: The second document will provide roadmaps for the recovery of bearded and ringed seals, and will include an introduction, as well as the three statutory requirements for a recovery plan: 1) objective, measurable recovery criteria; 2) site-specific management actions; and 3) estimates of time and costs to recover the species.

Recovery Implementation Strategy: The third document will provide specific, prioritized activities necessary to fully implement recovery actions in the Recovery Plan. The Recovery Implementation Strategy will be used for tracking progress and planning purposes.

Schedule

A copy of the workshop agenda can be found in the appendix of this document.

The two-day workshop was broken into sections based on different threat-related themes:

- Thursday, January 23, 2025: Background information; changing environmental conditions and loss of sea ice habitat
- Friday, January 24, 2025: Vessel traffic, fisheries interactions, oil and gas development, noise, disease, parasites, and predation

Participants

The workshop was attended by 79 participants representing a variety of expertise (Table 1). The workshop was organized by the NOAA Fisheries Ringed Seal Recovery Coordinator, Jenna Malek, and Bearded Seal Recovery Coordinator, Caroline Cummings. Meggie Stogner (NOAA Fisheries) served as notetaker. Kristin Mabry and Chelsey Young (both NOAA Fisheries) served as workshop facilitators. Several workshop participants gave presentations to provide the background information on the recovery planning process, as well as relevant information on the species and primary threats to the species to set the framework for the breakout groups and discussions that followed. Presenters included Jenna Malek, Kristin Koyama (NOAA Fisheries), Mike Runge (USGS) , Michael Cameron (NOAA Fisheries), Lori Quakenbush (accompanied by Anna Bryan, Justin Olnes, and Justin Crawford; Alaska Department of Fish and Game), and Rick Thoman (University of Alaska). Cyrus Harris (Maniilaq), Jesse Rogers (Bristol Bay Native Association), and Jared Nayakik (North Slope Borough) led a listening session on the importance of ice seals as a subsistence resource and the current environmental conditions that Alaska Native hunters are experiencing in their respective communities around the state.

Following the presentations, recovery criteria for ice seals related to changing environmental conditions, loss of sea ice, and ecosystem shifts that alter prey accessibility were discussed. These discussions continued on Day Two, with a focus on developing recovery actions for recovery criteria identified on Day One. Day Two also included discussions on recovery criteria and actions related to other threats identified in the status reviews of each species. Opportunities for public comment were provided at the end of each day, but we did not receive any public comments during the workshop.

Table 1. Alphabetical list of workshop participants and their affiliations (as identified via email or during the workshop). Key: ADFG = Alaska Department of Fish and Game; AFSC = Alaska Fisheries Science Center; AKRO = Alaska Regional Office; ISC = Ice Seal Committee; NGO = Non-Government Organization; PIRO = Pacific Islands Regional Office.

Participant Name	Partner Category	Affiliation
Billy Adams	Co-manager; Subsistence Hunter	ISC (Chair), North Slope Borough
Kayla Anatone-Ruiz	Federal Agency	Department of Defense, U.S. Navy
Jocelyn Borcuk	Federal Agency	Department of Defense, U.S. Navy
Peter Boveng	Federal Agency	NOAA Fisheries, AFSC Marine Mammal Laboratory
Anna Bryan	State Agency	ADFG, Arctic Marine Mammal Program
Shelby Burman	Researcher	Alaska Sea Life Center
Laura Busch	Federal Agency	Department of Defense, U.S. Navy
Michael Cameron	Federal Agency	NOAA Fisheries, AFSC Marine Mammal Laboratory
Justin Crawford	State Agency	ADFG, Arctic Marine Mammal Program
Caroline Cummings	Federal Agency	NOAA Fisheries AKRO Protected Resources Division
Shawn Dahle	Federal Agency	NOAA Fisheries, AFSC Marine Mammal Laboratory
Ragen Davey	NGO	Defenders of Wildlife
Monica DeAngelis	Federal Agency	U.S. Navy
Jorjana Dray	Co-manager	ISC, Bristol Bay Native Association
Bonnie Easley-Appleyard	Federal Agency	NOAA Fisheries AKRO Protected Resources Division
Anne Marie Eich	Federal Agency	NOAA Fisheries AKRO Protected Resources Division
Sierra Franks	Federal Agency	NOAA Fisheries AKRO Protected Resources Division
Steve Ferguson	International Federal Agency	Department of Fisheries and Oceans Canada
Cooper Freeman	NGO	Center for Biological Diversity
Verena Gill	Federal Agency	NOAA Fisheries AKRO Protected Resources Division
Roberta Glenn	Researcher	Alaska Arctic Observatory and Knowledge Hub; University of Alaska, Fairbanks
Carrie Goertz	Researcher	Alaska Sea Life Center
Sam Gosuk	Co-manager; Subsistence Hunter	ISC, Bristol Bay Native Association
Rowenna Gryba	Researcher	Inuit Circumpolar Council

Cyrus Harris	Co-manager; Subsistence Hunter	ISC, Maniilaq
Donna Hauser	Researcher	Alaska Arctic Observatory and Knowledge Hub, University of Alaska, Fairbanks
Taqulik Hepa	Co-manager; Subsistence Hunter	North Slope Borough Department of Wildlife Management
Jennifer Hooper	Co-manager; Subsistence Hunter	ISC/Association of Village Council Presidents
Henry Huntington	Researcher	Huntington Consulting
John Jansen	Federal Agency	NOAA Fisheries, AFSC Marine Mammal Laboratory
Devin Johnson	Federal Agency	US Fish and Wildlife Service, Marine Mammals Management
Brendan Kelly	Researcher	University of Alaska, Fairbanks
Mandy Keogh	Federal Agency	NOAA Fisheries AKRO Protected Resources Division
Kimberly Klein	Federal Agency	Bureau of Ocean Energy Management
Lydia Kleine	Federal Agency	NOAA Fisheries AKRO Protected Resources Division
Zoi Koulocheri	Researcher	Unknown
Kristen Koyama	Federal Agency	NOAA Fisheries Office of Protected Resources, Headquarters
Meghan Larson	Industry	Hilcorp
Sonia Laughland	Industry	Santos
Allison Lay	Environmental Analyst	Science Applications International Corporation
Joe Mello Leavitt	Co-manager; Subsistence Hunter	ISC, North Slope Borough
Jessica Lindsay	Federal Agency	NOAA Fisheries, AFSC Marine Mammal Laboratory
Josh London	Federal Agency	NOAA Fisheries, AFSC Marine Mammal Laboratory
Kristin Mabry	Federal Agency	NOAA Fisheries AKRO Operations Management Division
Barbara Mahoney	Federal Agency	NOAA Fisheries AKRO Protected Resources Division
Jenna Malek	Federal Agency	NOAA Fisheries AKRO Protected Resources Division
Liz McHuron	Researcher	University of Washington
Charles Menadelook	Co-manager; Subsistence Hunter	ISC, Kawerak
Jared Nayakik	Subsistence Hunter	North Slope Borough
Justin Olnes	State Agency	ADFG, Arctic Marine Mammal Program
Teodoro Pauk	Subsistence User	Bristol Bay Native Association

Li Philips	Environmental Consultant	HDR Consulting
Lori Polasek	State Agency	ADFG, Arctic Marine Mammal Program
Lori Quakenbush	State Agency	ADFG, Arctic Marine Mammal Program
Colleen Reichmuth	Researcher	Alaska Sea Life Center/ University of California, Santa Cruz
Issac Rivers	Co-manager; Subsistence Hunter	ISC, Association of Village Council Presidents
Emily Robinson	Federal Agency	Department of Defense, U.S. Navy
Jesse Rogers	Subsistence User	Bristol Bay Native Association
Mike Runge	Federal Agency	U.S. Geological Survey
Jill Seymour	Federal Agency	NOAA Fisheries AKRO Protected Resources Division
Jackie Shaff	Federal Agency	Marine Mammal Commission
Gay Sheffield	Researcher	AK Sea Grant, University of Alaska, Fairbanks
Timothy Smith	Co-manager; Subsistence Hunter	Maniilaq Association
Anne Southam	Industry	Eco49 Consulting
Kristen Steinmetzer	Curator	Alaska Sea Life Center
Raphaela Stimmelmayr	Researcher	North Slope Borough
Meggie Stogner	Federal Agency	NOAA Fisheries AKRO Protected Resources Division
Rick Thoman	Researcher	University of Alaska, Fairbanks
Nicole Thometz	Researcher	University of San Francisco
Irina Trukhanova	Federal Agency	U.S. Fish and Wildlife Service, Marine Mammals Management
Andy VonDuyke	Researcher, Co-manager	North Slope Borough, ISC Liaison
Sydney Waloven	Researcher	University of Michigan
Mike Williams	Federal Agency	NOAA Fisheries AKRO Protected Resources Division
Ryan Wilson	Federal Agency	U.S. Fish and Wildlife Service, Marine Mammals Management
Sheyna Wisdom	Researcher	Alaska Ocean Observatory System (AOOS)
Chelsey Young	Federal Agency	NOAA Fisheries PIRO Protected Resources Division
Dave Yurkowski	International Federal Agency	Department of Fisheries and Oceans Canada
Heather Ziel	Federal Agency	NOAA Fisheries, AFSC Marine Mammal Laboratory

Recovery Criteria Discussion

The ESA requires recovery plans to include objective, measurable criteria, which, when met, would result in a determination that the species would no longer meet the definition of the threatened or endangered (i.e., would be delisted). Developing objective, measurable criteria for a recovery plan focuses on two areas:

- **Biology-based/demographic criteria**

  These criteria will measure the performance of the species over a biologically meaningful period of time and can be tied to metrics relating to abundance, growth rate, and demographics (e.g., age and sex ratios, distribution of individuals among different subpopulations).

- **Threats-based criteria**

  These criteria will focus on the reduction of threats that could result in the decline of the species or that limit recovery. The five ESA section 4(a)(1) factors that were considered during listing must be considered during delisting (i.e., habitat destruction or modification; overutilization; disease or predation; inadequacy of existing regulations; and other natural or manmade factors affecting its continued existence).

During the workshop, participants were provided with recovery criteria examples from a variety of existing recovery plans. Participants were then divided into six randomly assigned breakout groups to brainstorm recovery criteria for bearded and ringed seals. Day One breakout groups focused on developing criteria related to changing environmental conditions and sea ice loss and Day Two breakout groups focused on developing recovery criteria related to other threats (i.e., vessel traffic, noise, oil and gas industry, fisheries interactions, disease, parasites, and predation).

Initial discussions centered on the challenge of envisioning a "recovered state" under future scenarios in which ice seal abundance is expected to decline drastically relative to current numbers. Many participants struggled with defining recovery under anticipated future deficits of ice seals. Key feedback in the recovery criteria discussions was that baseline data for both species are unavailable in terms of historical and current abundance, population structure, and life history parameters. Therefore, it was difficult to identify target values or appropriate thresholds for recovery criteria. Because we lack baseline data, we lack the ability to detect a substantial population decline with our current population assessment methods. Participants stated that a regionally-based habitat metric obtained from local knowledge on habitat suitability, or indices developed from harvested seals, such as the proportion of pups harvested, may be more feasible. Additionally, it was suggested that a different, yet representative, phocid (i.e., earless seal) that is not data-deficient be used as a proxy for life history parameters to apply to bearded and ringed seals.

Several participants reiterated a need for a regional approach to criteria development, given that environmental conditions, emerging threats, and habitat use vary across the species' ranges. Specifically, the continued involvement of local hunters in developing regional recovery

strategies will be key to success. The identification and implementation of recovery units/ecoregions representing different areas of Alaska was suggested as a potential recovery strategy. Criteria would then be fine-tuned for each recovery unit/ecoregion. Most breakout groups identified the availability of ice seals, in both access and quality/edibility, as a subsistence resource for future generations as a primary goal for the recovery plan. It was suggested that the development of specific indices/metrics for criteria related to the maintenance and success of ice seal harvest should be developed in collaboration with subsistence communities.

The list of criteria developed from these discussions is not final, but serves as the preliminary step to further developing recovery criteria for bearded and ringed seals. It should be noted that many metrics (e.g., abundance, carrying capacity, survival rates, recruitment rates necessary for persistence) are currently unknown for both bearded seals and ringed seals, and some of these suggestions came directly from existing documents (i.e., the Polar Bear Conservation Management Plan (U.S. Fish and Wildlife Service 2016)).

Suggestions for Potential Biology-based Criteria to Delist

- Sufficient habitat exists such that the population can successfully conduct life history functions throughout the species' current range through the foreseeable future (through 2100), that allows for:
    - Bearded seals: sea ice that supports critical life history periods, specifically, in March/April-early June (pupping, nursing, maturation, molt), and that occurs over shallow water (<500m) to ensure access to foraging grounds during these critical life history periods
    - Ringed seals: snow drifts of sufficient depth for the construction of subnivean lairs by March (average snow depth of >20 cm, ice structures to create pressure ridges, and snow drifts of 45 cm to allow for sufficient excavation; persistence of snow lairs throughout the pup maturation period (April-early June))
- X% of sea ice extent in Y% of ice seal range such that pupping can occur on ice.
- There is not a significant decline in the proportion of females successfully reproducing; there is evidence of continual pup production.
- Body condition of ice seals (as measured by blubber thickness, lipid density, quality of oil, or other parameters) indicates sufficient prey is available and is not limiting ice seal population growth or recovery.
- The nutritional and cultural needs of native peoples with connections to ice seal populations are met, including the opportunity for continued subsistence harvest for

future generations, such that 90% of coastal communities maintain access to healthy seals[2].

- The mean adult female survival rate is at least 93-95% (currently and as projected over 100 years)[2].
- The ratio of yearlings to adult females is at least 0.1-0.3 (currently and as projected over 100 years) [2].
- The carrying capacity, distribution, and connectivity in each recovery unit, both currently and as projected over the next 100 years, are such that the probability of persistence over 100 years is at least 90%[2].

Suggestions for Potential Threats-based Criteria to Delist

- Management actions sufficiently address noise disturbance, removal of prey by fisheries (targeted and bycatch), habitat destruction, interactions with marine debris, and other impacts to prey species such that they are available in adequate quantities for ice seals.
- The majority of coastal communities have shorefast ice during their traditional hunting seasons such that 90% of coastal communities maintain access to healthy seals.
- Management actions address the effects of anthropogenic noise (e.g., vessel traffic, sonar, seismic, development) on ice seals and their habitat such that it does not adversely interfere with critical life history functions and/or stages, or their ability to successfully communicate, forage, and travel.
- Activities related to resource development do not adversely interfere with ringed seal denning and pupping in the nearshore habitat, or access to important foraging areas.
- Positive collaboration and communication are in place with international counterparts related to oil and gas activities in international waters.
- Positive collaboration and communication are in place between industry (e.g., oil and gas, commercial shipping vessels) and Alaska Native communities to mitigate conflicts with subsistence hunting activities
- Management and enforcement mechanisms are in place to monitor and mitigate vessel traffic (i.e., avoidance of biologically sensitive areas, seasonal restrictions, speed restrictions) in Arctic waterways.
- The use of ice breakers in the Chukchi and Beaufort Seas is limited/restricted during certain times of the year to avoid interactions with ice seals.

[2] Criteria taken from the U.S. Fish and Wildlife Service Polar Bear Conservation Management Plan.

- A domestic and international oil spill response and coordination plan is in place for user groups in Arctic waterways.
- The implementation, assessment, and enforcement of existing permitting and regulatory processes associated with oil and gas activities and alternative energy development is maintained.
- Known and predicted ice seal deaths due to disease agents (e.g., pathogens, parasites and HABs) out to the end of the foreseeable future are sufficiently below ice seal recruitment levels to allow for population growth, even when deaths due to other causes are included.
- Chronic conditions, such as skin lesions that continue to be observed in some regions, associated with the most recent unusual mortality event (UME) are not causing population declines or limiting population recovery.
- The rate of human caused removals maintains the population in each recovery unit above its maximum net productivity level relative to carrying capacity[2].
- There is no change in the proportion of harvested seal pups that may indicate a change in survival related to predation (and exposure).

Recovery Actions Discussion

Recovery actions typically fall within three categories: 1) research, management, and monitoring, which may include enforcement; 2) outreach and education; and 3) international coordination efforts. Each recovery action should explicitly relate to the causes of imperilment; contribute to achieving recovery; include short and long-term actions; be site-specific; and be concise and action-oriented.

The second day of the workshop focused on brainstorming recovery actions to address the threats identified for bearded and ringed seals. Participants were asked to read a handout on recovery actions and a list of examples of recovery actions from existing recovery plans for other species to help guide discussions and build upon previous ideas. Following this brief overview of recovery actions, workshop participants were again divided into six randomly assigned breakout groups and asked to develop ideas on management, research, international coordination, and outreach and education, as they pertain to the main threats to bearded and ringed seals. Each group was asked to record all the ideas they generated. Once completed, a nominated member of each breakout group reported their ideas out to the rest of the room.

A primary discussion point was the inability to mitigate the overarching threat of climate change and associated habitat loss, and thus to focus on threats that can be mitigated, reduced, or removed through recovery actions that will help build the species' resilience. Additionally, participants emphasized the need to develop actions for threats that may emerge or be exacerbated due to climate change, and many expressed concerns over the increase in many stressors northward due to broadscale ecosystem shifts that are already occurring. Moreover, it was noted that many of these stressors overlap and likely have cumulative effects. There was

general agreement amongst participants that successful recovery and eventual delisting will require coordinated effort and partnership between researchers, managers, and industry, with an emphasis on working with the ISC in particular.

The following section provides a suite of potential recovery action ideas from participants. Actions are listed under subgroups of major topic themes (i.e., sea ice decline, vessel traffic, noise, etc.). As mentioned previously, these actions do not represent consensus views of NOAA Fisheries or the entire group of workshop participants. In some cases, they may represent a single individual's view or opinion.

After the initial report-outs from the breakout groups, participants were asked to individually prioritize recovery actions specifically related to climate change and sea ice decline, as this threat was viewed as the most significant yet the most challenging to address. Prioritization of recovery actions specifically related to climate change and sea ice decline was done through a sticker dot exercise; a greater number of sticker dots indicated a greater weight of importance to any given action.

Environmental Variability & Sea Ice Decline

- Sustain and strengthen the ISC to build relationships and ensure adequate input and expertise in ice seal management decisions. (46 dots)
- Incorporate local experts into study designs; improve/continue coordination amongst partners. (33 dots)
- Conduct on the ground observations (i.e., community level input) to obtain more fine-scale data on sea ice/snow conditions to identify regional differences in habitat use across the species' range. (25 dots)
    - methods for data collection include the development of a phone app to collect information and photos and/or household surveys within subsistence communities to gain feedback on the condition of harvested seals and the environment
- Conduct research on ice seal habitat requirements to understand how sea ice loss is impacting ice seals over time; make the connection between sea ice and snow cover and vital rates/population level effects. (23 dots)
- Continue monitoring ice seal health, body condition, and work to further understand the recent UME in the context of climate change, as well as monitor emerging health concerns. (17 dots)
- Conduct studies to understand how much plasticity there is in ice seals, i.e., are they successful at breeding, molting, and pupping/denning without ice/on land? (17 dots); this could be assessed by:
    - Captive studies
    - Studies on the Okhotsk Distinct Population Segment (DPS)

- Implement movement studies to understand how ice seals are responding to changing weather and climate conditions. (12 dots)
- Engage in and commit to international coordination and agreements to reduce global carbon emissions. (11 dots)
- Incorporate actions that help to reduce carbon emissions into Section 7 consultations. (11 dots)
- Conduct monitoring studies/aerial surveys/population assessments across the species' range to improve our understanding of abundance and population trends. (11 dots)
- Increase communication, outreach, and international coordination on climate change. (8 dots)
- Conduct research on transboundary habitat use (i.e., Canadian and Russian habitat). (8 dots)
- Monitor/document/prevent/create measures for ice-breakers and destruction of critical sea ice habitat. (5 dots)
- Improve understanding of how ice seals need ice/habitat requirements. (5 dots)
- Compile/synthesize broad datasets across decades that currently exist; identify stressors over time. (4 dots)
- Collaborate with polar bear scientists to connect polar bear health to the health and availability of their prey (ice seals). (2 dots)

Noise

- Assess noise distribution/define the baseline soundscape of ice seal habitat.
- Assess the acoustic disturbance of fish and other prey species; monitor and document distributional changes of prey species in response to noise.
- Track level A and level B MMPA permits issued in areas occupied by ringed and bearded seals to assess cumulative noise effects from industry projects.
- Determine whether acoustic masking is occurring; create a zone of masking based on known sound sources and ice seal hearing ranges to develop a threshold for noise disturbance.

Health and Disease

- Continue and expand monitoring efforts through the establishment of regionally-based surveillance hubs.
- Conduct continuous monitoring of:
    a. health (disease and parasites, increases or novel exposure, like Avian influenza),
    b. environment (e.g., harmful algal blooms (HABs) and precursors, contaminants).

- Use historical data (e.g., from UMEs) to better understand the connections between a warming climate and changes in sea ice with increases in disease, parasites, and vectors.
- Establish early detection communication pathways to subsistence users about the health of ice seals, especially in light of recent HAB concerns.
- Develop studies that assess changes in the incidence, prevalence, and transmission pathways of disease and parasites in ice seal populations due to changes in sea ice habitat or the use of sea ice habitat.

Vessel Traffic

- Establish a rating system with incentives for improvements in ship design that reduce noise.
- Work with partners to develop recommendations for shipping routes that include buffer zones around biologically important areas (BIAs) and with seasonal restrictions (i.e., during breeding, pupping, etc.).
- Improve data collection and monitoring of ship traffic throughout Alaska through the use of Automatic Identification System (AIS) data, land-based receivers/offshore moorings, and local knowledge.
- Collate/overlay AIS and other vessel data with seal habitat to identify whether interactions are occurring; document and quantify disturbance.
- Establish management units/regionally relevant action plans for vessel traffic (and other stressors) that work to minimize vessel disturbance to seals.
- Increase collaboration with the U.S. Coast Guard to improve vessel monitoring in the Arctic.
- Work with other nations across the species' range on measures related to managing tourism (e.g., cruise ships) and monitoring other vessels that travel through trans-boundary waterways.
- Assess seal haul-outs/haul-out behavior related to vessel traffic disturbance/shipping lane proximity; identify sensitive haul-out areas to avoid and identify better locations for shipping lanes and/or ways to reduce vessel concentration in biologically sensitive areas at a time.
- Develop a conflict avoidance plan (or other adaptive management tool) that can be implemented on a local/community level.
- Continue to work with Indigenous People's Council for Marine Mammals (IPCOMM) and develop actions for vessel disturbance issues.
- Assess effects of ice breakers on multi-year ice and cascading local effects that occur from modification of ice-cover and open-water dynamics.
- Develop bioenergetic models related to vessel disturbance.

- Work with the tourism industry to collect observations on ice seal sightings and responses to vessels.
- Develop a dedicated outreach program to vessel operators regarding ice seal presence and ways to avoid important habitat.

Oil and Gas

- Conduct a cumulative review of required industry monitoring to assess the effectiveness of existing mitigation measures.
- Continue and expand communication centers across the state to improve coordination on spill response, training, and job opportunities.
- Leverage industry projects with monitoring efforts and ice seal surveys; look for positive opportunities to include subsistence users in these processes.
- Build on the successes of previous industry work conducted by Northstar and Shell, and use those successes as a guideline to build partnerships between industry, researchers, and managers.
- Conduct studies to understand acute and chronic noise disturbance of oil and gas activities on ice seals e.g., research sound propagation through snow and ice to better understand received sound levels in ringed seal dens.
- Create and maintain designated "spill free zones" within ice seal habitat.
- Monitor inshore and offshore oil and gas activities to minimize human interactions with ice seals.
- Restrict oil and gas activities in important feeding areas (e.g., "hotspots" like Barrow Canyon and Hanna and Harold Shoals).
- Conduct sampling studies to assess hydrocarbon uptake in bivalves and other benthic prey species.
- Conduct targeted studies/implement scenario planning for effective spill response under varying sea ice conditions.
- Create/develop conservation banks or other compensatory mitigation strategies to offset the adverse effects of oil and gas activities or related oil spill events on ice seals.

Fisheries Interactions

- Assess the effects of noise from fishing vessels, as well as novel gear types on ice seals.
- Assess the effects of commercial fishing further north into the Chukchi sea and other ice seal habitat.
- Continue to monitor ice seal bycatch and increase observer coverage where necessary.

- Establish international agreements to minimize interactions between commercial fisheries and ice seals.
- Conduct studies on commercially viable fish that are also top prey species; identify key prey species for ice seal needs and whether there are adverse consequences due to competition with commercial fisheries.
- Continue monitoring ice seal diet and body condition to understand prey availability and accessibility, and to elucidate broader ecosystem shifts that may increase competition with fisheries or increase interspecies competition.
- Develop indices for adequate prey availability with subsistence users, such as blubber thickness, parasite load, and condition of the coat.
- Evaluate the distribution of forage fish to assess impacts on and changes to fisheries and seal distribution
- Develop sustainable fishing practices and gear modifications to minimize seal interactions
- Reduce marine debris of fisheries origin through removal efforts or prevention initiatives

Predation

- Work with the U.S. Fish and Wildlife Service to assess polar bear predation rates and the relationship of predation rates to the loss of snow and sea ice habitat e.g., is there an increase in polar bear predation on ringed seals due to a reduction in the number and quality of snow lairs?
- Assess the change in the predator landscape; determine whether there is an increase in exposure to existing and/or novel predators (e.g., killer whales, dogs, foxes, wolves, and black or brown bears) due ice seal distributional changes resulting from a decline in sea ice habitat.

Next Steps

The following actions will continue or commence:

- Conduct monthly co-management meetings with ISC regarding recovery planning and other ice seal issues;
- Outreach to additional regional hubs and communities, including a presentation on recovery planning at the *Strait Science* lecture series;
- Additional virtual public meetings, as needed;
- Draft the Beringia DPS Bearded Seal and Arctic Ringed Seal Recovery Plans and Recovery Implementation Strategies (RIS)
- Release the Recovery Plans for peer review and public comment
- Incorporate comments and finalize Recovery Plans and Implementation Strategies
- Work with partners to implement recovery actions

Appendix

NOAA Fisheries

Ice Seal Recovery Planning Workshop Agenda

January 23-24, 2025

BP Energy Center, Spruce/Willow Rm

1014 Energy Court, Anchorage, AK 99508

9 am – 4:30 pm

Thursday, January 23, 2025

Introduction to recovery planning and ice seals; Brainstorm Session 1 (open to the public)

Virtual Meeting Link: meet.google.com/ybu-qsjf-bzn

Call in #: (US) +1 559-715-1136 PIN: 439 566 531#

- Welcome remarks (Anne Marie Eich, NOAA Fisheries) ..... **9:00 am**
- Land Acknowledgement (Anne Marie)..... **9:05 am**
- Brief overview of workshop agenda, protocols, safety briefing, restrooms (Chelsey Young & Kristin Mabry, NOAA Fisheries)..... **9:10 am**
- Participant introductions in room and virtual (Chelsey & Kristin)..... **9:15 am**
    - Name and affiliation
- Overview of the recovery planning process (Kristen Koyama, NOAA Fisheries) **9:30 am**
    - Description: Overview of recovery and recovery plans; the 3-part recovery framework; pieces of a recovery plan that will be addressed during the workshop; how recovery plans are used
- Recovery in the context of climate change (Mike Runge, USGS)..... **10:00 am**
    - Description: Reflections on the Polar Bear Conservation Management Plan (2016), which is both an ESA Recovery Plan and an MMPA Conservation Plan. The challenges of limited jurisdiction, a quickly changing environment, and uncertainty will be discussed, as will the opportunities provided by a committed set of partners.

BREAK 10:30 am

- Introduction to ringed and bearded seal 5-year reviews and overview of threats (Mike Cameron, NOAA Fisheries)..... **10:45 am**
    - Description: Basic history and high-level overviews of the findings of the Ringed and Bearded Seal 5-yr status reviews and Marine Mammal Lab research.
- Current and future ringed and beard seal research efforts (Alaska Department of Fish and Game)..... **11:25 am**
    - Description: ADF&G will present an overview of ringed and bearded seal population status including abundance, diet, body condition, growth rate, pregnancy rate, age at maturity, and pup survival past weaning since the 1960s based on samples from the Alaska Native subsistence harvest. Current information on harvest sustainability and trend, parasites, contaminants, and disease will also be presented.
- State of the Arctic (Rick Thoman, University of Alaska)..... **11:55 am**
    - Description: The marine environment in the seas around Alaska are changing quickly with the seasonality, thickness and extent of sea ice changing and ocean surface temperatures warming. This presentation will look at some of the trends that are underway and what the coming decades may bring to the ocean climate system.

LUNCH ON YOUR OWN 12:20 pm

- Ice seals and subsistence culture (Cyrus Harris & TBD, Ice Seal Committee).. **1:30 pm**
- Breakout Session #1 (Chelsey & Kristin)..... **2:00 pm**
    - Brainstorm recovery criteria for climate change, sea ice decline, and resulting habitat loss and access to prey

BREAK 3:00 pm

- Group discussion and report out of Breakout Session #1 (Chelsey & Kristin).... **3:15 pm**
- Public comments/questions, wrap-up, outlook for Day 2 (Chelsey & Kristin).... **4:15 pm**

Friday, January 24, 2025

Recovery criteria and action development and future planning (open to the public)

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- Recap of Day (Chelsey & Kristin)..... **9:00 am**
- Group Discussion: Brainstorm recovery actions for climate change, sea ice decline, and habitat loss and access to prey (Chelsey & Kristin)…… **9:30 am**
- Group Discussion: Prioritize recovery actions for climate change, sea ice decline, and habitat loss and access to prey (Chelsey & Kristin)…… **10:30 am**

BREAK 10:45 am

- Breakout Session #2 (Chelsey & Kristin)..... **11:00 am**
    - Brainstorm recovery criteria for other threats: vessel traffic, oil and gas, fisheries interactions, noise, disease

LUNCH ON YOUR OWN 12:15 pm

- Group Discussion and report out of Breakout Session #2 on vessel traffic, oil and gas, fisheries interactions, noise, disease (Chelsey & Kristin)..... **1:30 pm**
- Group Discussion: Brainstorm recovery actions for vessel traffic, oil and gas, noise, fisheries interactions, disease **(**Chelsey & Kristin**)**..... **2:30 pm**

BREAK 2:45 pm

- Group Discussion (cont'd): Brainstorm recovery actions for vessel traffic, oil and gas, noise, fisheries interactions, disease **(**Chelsey & Kristin**)**..... **3:00 pm**
- Group Discussion: Prioritize recovery actions for vessel traffic, oil and gas, noise, fisheries interactions, noise (Chelsey & Kristin)..... **3:45 pm**
- Recap (Chelsey & Kristin)..... **4:00 pm**
    - Outline path forward, discuss additional opportunities for partner input and engagement

- Public comments/questions (Chelsey & Kristin)..... **4:15 pm**
- Thank Yous and Adjourn (NOAA Fisheries Staff)..... **4:30 pm**