Alaska Fisheries Science Center

Protected Species Science Program Review

Theme 1: Information Needs

Protected Resources Information Needs

Alaska Regional Office Protected Resources Division

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What Makes Protected Resources Management (and thus Protected Resources Science) Unique in Alaska?

- All our protected species are marine mammals (so far)
- Arctic issues: climate change, loss of sea ice, increasing oil and gas exploration and development, new shipping lanes, etc.
- Alaska Native subsistence uses and co-management
- Only one state partner, and a big emphasis on state's rights
- Well-informed and actively involved fishing industry
- Challenges of being in Alaska: vast size, limited infrastructure, sparse population

Threatened and Endangered Marine Mammals in Alaska

- Bowhead whale (E)
- Humpback whale (E)
- Fin whale (E)
- North Pacific right whale (E)
- Sperm whale (E)
- Blue whales (E)
- Sei whale (E)
- Western N. Pacific gray whale (E)
- Cook Inlet beluga whale (E)
- Western DPS Steller sea lion (E)
- Ringed seal (T)
- Iliamna Lake Harbor seal (candidate)

(Also visitors from the south: Pacific northwest salmon, green sturgeon, sea turtles)

Non-Listed Marine Mammals in Alaska

- Killer whale
- Beluga whale
- Baird's beaked whale
- Cuvier's beaked whale
- Stejneger's beaked whale
- Eastern N. Pacific gray whale
- Minke whale
- Narwhal
- Harbor porpoise
- Dall's porpoise
- Pacific white-sided dolphin
- Eastern DPS Steller sea lion
- California sea lion
- Northern fur seal
- Bearded seal
- Spotted seal
- Ribbon seal
- Harbor seal
- Elephant seal

Coordination Between NMML and PRD

- "The Region is our #1 customer!"
- Annual NMML-PRD coordination meetings
  - Review status of each other's major activities
  - PRD provides a list of foreseeable products needed within the next 12-18 months, and their relative priorities
  - Recently added discussion of longer term information needs
- Frequent coordination at other times throughout the year
- Protocol for ad hoc requests
- Joint NMML-PRD coordination with Bureau of Ocean Energy Management on annual study plans
- Coordination on annual spending plans and shortfalls

Protected Resources Information Needs in Alaska Aren't Limited to Marine Mammals

- Petition to list Lynn Canal Pacific herring (2007)
- Petition to list 43 coral species (2012)
- Petitions to list pinto abalone (2013)
- Prey field studies for marine mammals that may be prey-limited or may face indirect competition from fisheries:
  - WDPS Steller sea lions (e.g., Atka mackerel tagging studies)
  - Northern fur seals
  - Harbor seals in western Aleutians

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Overview

- Identify marine mammal management priorities
- Identify the science needed to support management
  - Items in blue: funded research
  - Items in red: highest priority unfunded research
- Identify emerging issues and longer term needs

Top 10 Marine Mammal Management Priorities

- Understand and address the factors limiting recovery of western DPS Steller sea lions (especially in the western and central Aleutian Islands).
- Understand and address the factors limiting recovery of Cook Inlet beluga whales.
- Understand and address factors impacting the conservation and management of northern fur seals.
- Minimize marine mammal harassment and injury from anthropogenic noise.
- Develop an understanding of north Pacific right whale population dynamics and seasonal distribution to identify measures to promote recovery.
- Estimate harvest levels and health of subsistence species across rural Alaska communities (e.g. Steller sea lions, ice seals).
- Develop safe and effective measures to deter marine mammals from becoming entangled in fishing gear (e.g. humpback whale, harbor porpoise).
- Develop credible Biological Opinions for high profile ESA section 7 consultations.
- Maintain and improve the quality of stock assessments for effective conservation and management (e.g. ice seals, harbor seals).
- Address the separate and combined effects of climate change and anthropogenic activities on marine mammals.

Understand and Address the Factors Limiting Recovery of Western DPS Steller Sea Lions (especially in the western and central Aleutians)

Management Issues

- Revise the 1993 Critical Habitat designation
- Complete new Biological Opinions as needed to assess potential competition between sea lions and commercial fisheries (the nutritional stress hypothesis) – remains extremely contentious
- Implement actions in the Recovery Plan

Science Priorities

- Estimate abundance and trends
- Estimate age-specific survival and reproductive rates
- Use data from tagged animals etc. to define important foraging areas (especially during non-breeding season), weigh hypotheses for the lack of recovery, and evaluate the efficacy of fishery management measures
- Investigate foraging behavior of adult females in the areas of greatest decline (central and western Aleutians)
- Assess prevalence of disease and potential role of contaminants in affecting survival or reproduction
- Determine age-specific survival and reproductive rates in the Russian component of the wDPS
- Expand use of Unmanned Aircraft Systems to collect count data and photograph brands in the western Aleutians

Understand and Address the Factors Limiting Recovery of Cook Inlet Beluga Whales

Management Issues

- Finalize and implement the Recovery Plan
- Improve response capabilities for live and dead strandings
- Consult with federal agencies on development activities to minimize impacts; Improve understanding of key life history and biological parameters to make those reviews more effective
- Maintain Alaska Native support for refraining from harvest while the population rebuilds

Science Priorities

- Continue to estimate abundance and trends
- Update analyses of population viability and extinction risk
- Investigate effects of anthropogenic activities including cumulative acoustic effects
- Understand foraging ecology and prey habits, especially in winter
- Continue photo-identification studies to better understand life history parameters (e.g., reproduction rates, calf survival) and social structure (e.g., group dynamics, cow/calf relationships)
- Develop a biopsy program to address recovery-related data gaps, and link data with the photo-identification catalog

Understand and Address Factors Impacting the Conservation and Management of Northern Fur Seals

Management Issues

- Develop new subsistence harvest regulations for St. Paul Island
- Provide an adequate presence in the Pribilofs for effective co-management and enforcement
- Develop a better understanding of the potential for direct or indirect fishery interactions

Science Priorities

- Estimate abundance and trends
- Assess age-specific survival and reproductive rates
- Understand effects of winter migration on survival and reproduction
- Understand foraging ecology/food habits
- Assess baseline levels of disease and condition indices
- Sample subsistence-harvested animals for disease studies

Minimize Marine Mammal Harassment and Injury from Anthropogenic Noise

Management Issues

- Address the effects of increasing oil and gas exploration and development in the Beaufort Sea, Chukchi Sea, and Cook Inlet
- Address other sources of acoustic impacts (coastal construction, vessel traffic)
- Identify species-specific acoustic thresholds for harassment and injury and authorize takes under ESA and MMPA

Science Priorities

- Monitor and assess received levels of noise at various locations (e.g., Arctic, Cook Inlet)
- Conduct studies to understand the biological significance of changes in behavior due to anthropogenic noise, and the effects of repeated harassment

Develop an Understanding of North Pacific Right Whale Population Dynamics and Distribution to Identify Measures to Promote Recovery

Management Issues

- Address effects of shipping (ship strikes and noise from traffic that is likely to increase through the Bering Strait) and other potential threats (e.g. entanglements)

Science Priorities

- Conduct visual and acoustic surveys in the central Gulf of Alaska and Bering Sea to assess current occurrence and distribution
- Deploy satellite tags on right whales to understand movements, habitat use, and migratory destinations
- Collect biopsy samples for genetic analysis

Estimate Harvest Levels and Health of Subsistence Species Across Rural Alaska Communities (e.g. Steller sea lions, harbor seals, ice seals)

Management Issues

- Provide adequate financial support for Alaska Native Organizations to help monitor subsistence harvests and participate in bio-sampling via co-management
- Provide sufficient NMFS staff support for co-management

Science Priorities

- Monitor harvests to provide insights about levels, timing, areas, and effort, and changes in these parameters over time.
- Collect and analyze tissue samples from harvested marine mammals to provide information on the diet, demography, physiological condition, contaminant load, and vital rates of harvested animals.

Develop Safe and Effective Measures to Deter Marine Mammals from Becoming Entangled in Fishing Gear (e.g. humpbacks, harbor porpoise)

Management Issues

- Develop clear guidance regarding acceptable deterrence mechanisms for listed and non-listed species
- Develop credible estimates of the frequency and severity of interactions between marine mammals and commercial fisheries

Science Priorities

- Summarize fishery-related serious injury/mortality and population information in the Stock Assessment Reports to advise on the population-level impacts of fishery interactions
- Continue to implement the Alaska Marine Mammal Observer Program to assess interactions
- Conduct surveys of harbor porpoise in Southeast Alaska to understand the abundance and trends of animals in areas of active commercial fishing
- Monitor entanglement rates of humpback whales through photographic scarification analysis

Develop Credible Biological Opinions for High Profile ESA Section 7 Consultations

Management Issue

- Respond to an increasing number and complexity of requests for section 7 consultation, and improve the scientific rigor and efficacy of our Biological Opinions (high profile actions include oil and gas exploration and development in the Beaufort and Chukchi seas and Cook Inlet, and periodic changes to fishery management in the Aleutian Islands)

Science Priorities

- Provide marine mammal density estimates for the Arctic to help assess effects of proposed activities, sometimes in areas and months that have not been surveyed
- Assess behavioral reactions of denning ringed seals to oil exploration activities
- Provide expertise on the effects of novel stressors
- Provide supporting analyses for Biological Opinions as needed

Maintain and Improve the Quality of Stock Assessments for Effective Conservation and Management (e.g. ice seals, harbor seals)

Management Issues

- Monitor stocks of ringed, bearded, ribbon, and spotted seals as sea ice recedes to detect changes and consider protective measures as appropriate
- Identify factors affecting harbor seal declines in the western Aleutian Islands

Science Priorities

- Complete data analysis from ice seal aerial surveys in the Bering Sea in FY13
- Use abundance and distribution surveys in conjunction with satellite data records to investigate ice seal ecology and determine effects of climate and anthropogenic effects
- Tag bearded seals in the Chukchi Sea to understand seasonal movements
- Conduct aerial surveys for ice seals in the Chukchi Sea
- Conduct aerial surveys for harbor seals in the western Aleutian Islands
- Conduct ship-based studies of harbor seals in the western Aleutians to understand ecology, distribution, and movements
- Convene international workshop on methods for population genetic structure of ice-associated seals

Most Alaska stock assessments are Tier 1 (no data available), some are Tier 2, none are Tier 3.

Address the Separate and Combined Effects of Climate Change and Anthropogenic Activities on Marine Mammals

Management Issues

- Incorporate climate change considerations into listing decisions, conservation measures, recovery planning, Biological Opinions, etc.
- Develop a better understanding of the separate and combined effects of climate change and anthropogenic activities on various species and their interaction

Science Priorities

- NMML is conducting various studies of distribution and movements, vital rates, and habitat use for a very few marine mammal species that would be relevant to addressing this topic. NMML would need an excellent understanding of these biological features, and an understanding of the natural variability in these features over many years, to address this issue.
- To address this management need, NMML would require:
  - Time series of key population parameters and vital rates during periods (or locations) with & without anthropogenic impacts (unavailable for nearly all Alaska species)
  - Focused studies on correlations between environmental features and vital rates
  - Focused studies on correlations between anthropogenic activities and vital rates
  - Develop models of cumulative effects of multiple anthropogenic activities over space and time

Marine Mammal Science & Management: Emerging Issues and Longer-term Needs

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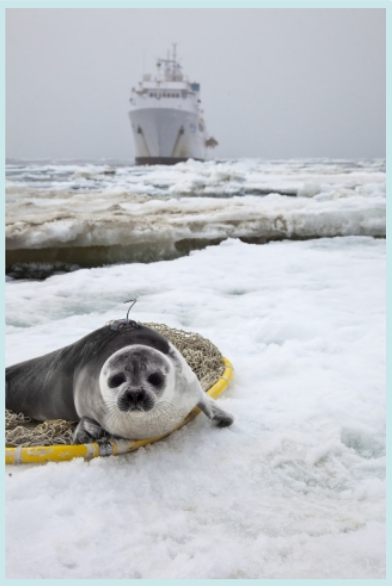

- Changes in the Arctic (i.e. climate change, loss of sea ice) and ensuing impacts to marine mammals – direct impacts due to habitat changes and indirect impacts due to increases in human activities such as oil & gas, shipping, fishing
- Increasing number of petitions under the ESA
  - Recent: ice seals; Lake Iliamna seals; pinto abalone; humpback whales
  - Future(?): northern fur seals; western Aleutian Islands harbor seals; others
- Possible status review to consider downlisting bowhead whales under the ESA?
- Increasing number and complexity of ESA section 7 consultations
- Increasing needs and expectations for tribal consultation on marine mammal issues
- Continued and increasing needs to support international marine mammal activities (e.g. International Whaling Commission, Arctic Council, U.S. bilaterals with Russia and Canada)
- Further resource limitations (budgets, ship time, etc.) constrain the timeliness of obtaining scientific products and making management decisions
- Increasing number of lawsuits on ESA/MMPA actions
- Oil spill preparedness!

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Questions?

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http://www.alaskafisheries.noaa.gov/protectedresources