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Update on the Eastern Pacific Stock of Laaquadan (Northern Fur Seals): Co-management and Conservation Plan updates

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Outline

Quick updates on co-management activities:

- harvest management
- entanglement, marine debris
- sUAS surveys
- VHF



Focus: Conservation Plan Update

- Objectives (4)
- Conservation Actions and Initiatives



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Co-management:

Status and Updates on Laaqudan - Northern fur seals Harvest/Hunt Management

Hunting season Jan 1 - May 31, 2021

- 7 laaqudan hunted
- 1 was struck and lost and 6 were retrieved (3 from Reef and 4 from Northeast Point)
- Island Sentinels were able to collect the 3 snouts

Sub-adult male harvest season July 2-30, 2021

- 7 harvest events
- 132 fur seals were harvested from three different haulout areas: Big Zapadni, Little Zapadni, Polovina and Lukanin
- 131 sub-adult males and 1 female taken



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Co-management: Status and Updates on Laaquadan - Northern fur seals Harvest/Hunt Management

Laaquadan (pup) season Aug 27 - Oct 28, 2021

- 23 laaquadan harvested
- 2 yearlings were also hunted
- All were male pups and yearlings
- Harvested from three haulout or rookery sections: Sea Lion Neck, Little Zapadni, Polovina
- To minimize female mortality the harvest method included capturing, handling, and sexing all laaquadaadan prior to harvest



Co-management: Status and Updates on Laaqudan - Northern fur seals Entanglement/Marine Debris

Entanglement

- Implemented Entanglement Observer Program in 2021
- 11 seals observed over the season, 4 disentangled
- Improving protocol for 2022 season

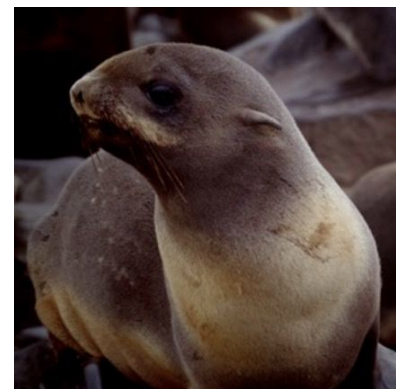
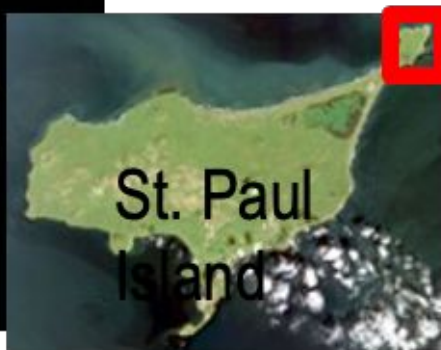
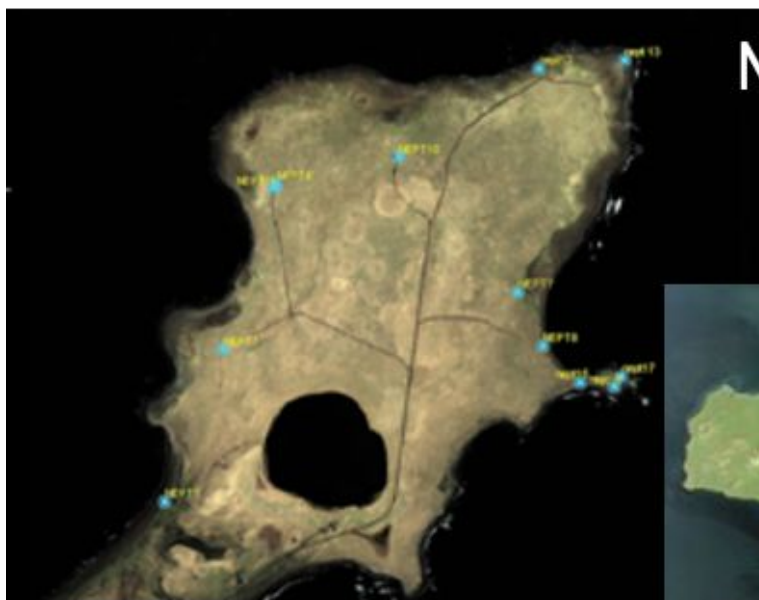
Marine Debris

- Postponed 2021 NOAA- funded marine debris clean-up due to Covid-19 restrictions
- tentatively planning for April – May 2022 clean-up
- Collaborating with St. George Island on 2022 clean-up (and backhaul of historical supersacks)



Co-management: Status and Updates on Laaqudan - Northern fur seals VHF

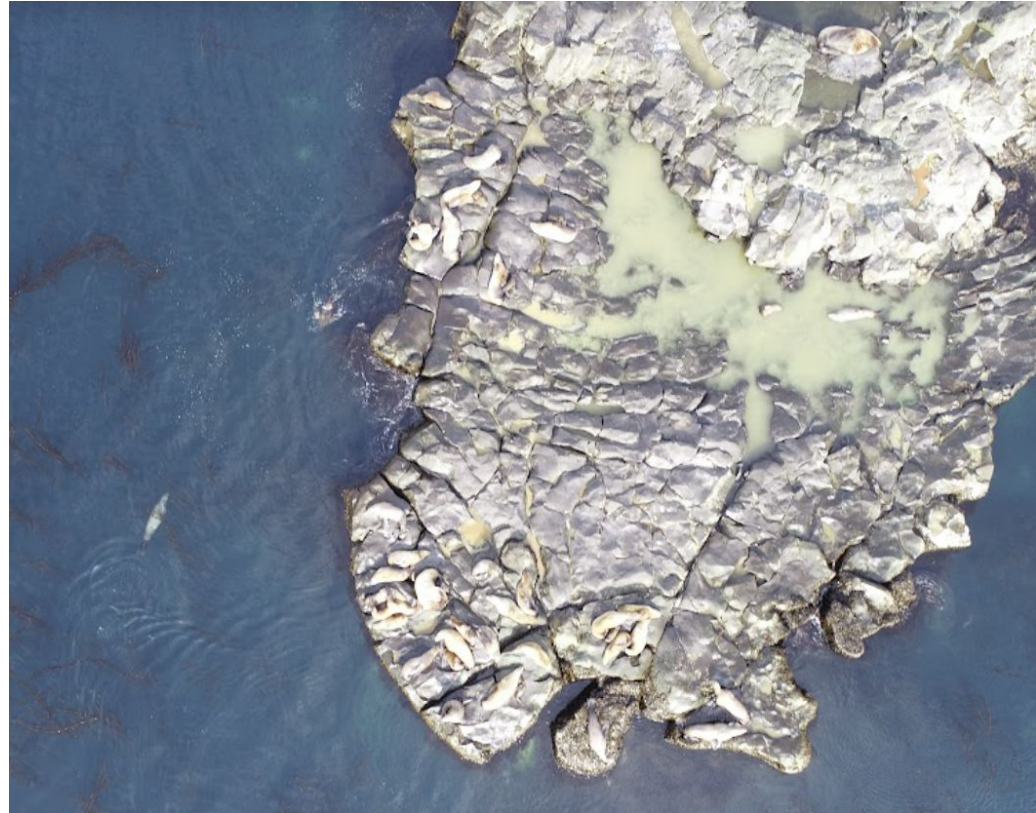
- Postponed work to 2022 (again)
- Will tag up to 50 female NFS at NEP in 2022, 2023 (beyond?)
- Receivers have been in place at NEP since 2021
- Continue to download VHF receiver data (across the island)



Co-management: Status and Updates on Laaqudan - Northern fur seals sUAS (drone) Surveys



Harbor seal surveys July-August, 2022
Otter Island



Steller sea lion survey July, 2022
Walrus Island



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Conservation Plan revision

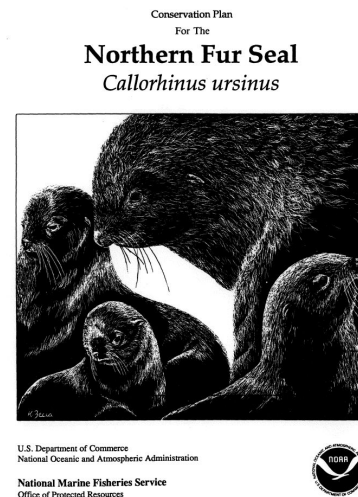
- Created team from the Regional Office to initiate background review and update
- Finalized Terms of Reference Agreement with co-managers and non-NOAA stakeholders interested in Plan revision
- Convened 3 workshops to review, reorganize, revise draft “Conservation Actions” and “Initiatives”



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Conservation Action workshops outcomes

- “Conservation Objectives” remain the same (4)
- Many “Conservation Actions” remained similar
- Reorganizing /restructuring to reduce duplications
- Renamed “sub-actions” to “Initiatives”



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Objectives

Objective 1. Identify and reduce human caused mortality of the Eastern Pacific stock of northern fur seals.

Objective 2. Assess and avoid or mitigate adverse effects of human related activities on or near the Pribilof Islands and other habitat essential to the survival and recovery of the Eastern Pacific stock of northern fur seals.

Objective 3. Continue and, as necessary, expand research and management programs to monitor trends and detect natural or human-related causes of change in the northern fur seal stock and habitats essential to its survival and recovery.

Objective 4. Coordinate and assess the implementation of the conservation plan, based on implementation of conservation actions and completion of high priority studies.



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Objective 1. Identify and reduce human caused mortality of the Eastern Pacific stock of northern fur seals.

A. Improve understanding of the sources, fates, and effects of marine debris

B. Improve assessments of incidental take of NFS in commercial fishing operations

C. Evaluate harvests for subsistence uses



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1. A. Improve understanding of the sources, fates, and effects of marine debris

A.1 Assess entanglement rates and continue disentanglement program to reduce mortality and harm to fur seals entangled in marine debris

A.2 Remove and incorporate surveys of marine debris in northern fur seal habitats



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1. A. Improve understanding of the sources, fates, and effects of marine debris

A.3 Develop and implement efforts to support education and enforcement of marine debris reduction and prevention

- Determine the sources of marine debris and identify methods of reducing or mitigating the source(s) For example: Continue and expand programs that encourage reduced use of materials that are commonly found entangling NFS (e.g., packing bands)
- Continue, develop, expand and implement efforts to support education and enforcement to prevent and reduce the amount of marine debris in marine and terrestrial fur seal habitats.



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1. B. Improve assessments of incidental take of fur seals in commercial fishing operations

B.1 Implement and evaluate fishery and marine mammal observation programs in the North Pacific Ocean and Bering Sea

Initiatives

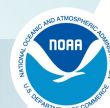
- Continue observation programs in the northern fur seal habitat to continue to estimate the level of incidental take and to identify changes in fishing gear or practices that might reduce fisheries-related mortalities
- Review existing and future data collected from fisheries observer programs to assess, and account for the effects of incidental take in the northern fur seal stock assessment
- Evaluate the opportunity to gather biological data from fur seals taken in fisheries, for use in determining the impact of incidental take.



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Objective 2. Assess and avoid or mitigate adverse effects of human related activities on or near the Pribilof Islands and other habitat essential to the survival and recovery of the Eastern Pacific stock of NFS.

- A. Develop and expand the implementation of co-management agreements with Tribal governments and Alaska Native Organizations
- B. Advise and consult with the relevant action agencies and industries to ensure taking is authorized and effects are minimized
- C. Conduct studies to quantify effects of human activities (e.g. research, hunting, tourism, vehicles, discharges, facilities) at or near breeding and resting areas
- D. Undertake conservation or management measures as necessary to eliminate or minimize adverse effects on fur seals or their habitat
- E. Assess and monitor pollutants
- F. Quantify relationships between fur seals and fisheries**



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2. F. Quantify relationships between fur seals and fisheries

F.1 Assess interactions between fur seal prey resource use and fisheries

- Identity species and age classes of commercial and non-commercial prey consumed by NFS and the temporal and spatial overlap of fur seals and fisheries
- Analyze and review relevant information regarding the distribution and abundance of NFS prey resources, commercial exploitation of fur seal prey, and the energetic requirements of fur seals to determine the necessary resources for the recovery of the fur seal population
- Measure effects of fishing on prey (both commercial and non-commercial) composition, distribution, abundance, and schooling behavior



2. F. Quantify relationships between fur seals and fisheries

F.1 Assess interactions between fur seal prey resource use and fisheries- *Continued*

- Model effects of fishing on commercial and non-commercial prey composition, distribution, abundance, and schooling behavior, evaluating model sensitivity, validity and conformity to known data sets, and
- Fully incorporate the energetic requirements of fur seals into multispecies stock assessments, ecosystem models, and fishery management plans.
- Develop methods to evaluate the effects of existing fisheries closures and other management actions on northern fur seals into fishery management strategies to better balance economic, social, and biological objectives.



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2. F. Quantify relationships between fur seals and fisheries

F.2 Report fishery interactions

- Continue and expand reporting systems to provide information relevant to the status of exploited fish stocks and the recovery of the fur seal population.
- Evaluate examining stomach contents of seals taken incidentally in fishing operations, stranded and dead on the rookeries.



Objective 3. Continue and, as necessary, expand research and management programs to monitor trends and detect natural or human-related causes of change in the NFS stock and habitats essential to its survival and recovery.

A. Monitor and study changes in NFS populations

B. Improve assessment of the effects of disease

C. Describe and monitor NFS habitats and occupancy of those habitats

D. Identify and evaluate ecosystem changes



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3. A. Monitor and study changes in NFS populations

A.1 Estimate stock vital rates

A.2 Continue regular counts of adult males and estimates of pup production on St. Paul, St. George, and Bogoslof Islands

A.3 Monitor and study changes in diet, foraging behavior, and physiology



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3. A. Monitor and study changes in NFS populations

A.3 Monitor and study changes in diet, foraging behavior, and physiology

Initiatives

- Continue studies to identify species and age classes of prey consumed by fur seals during the summer breeding and winter non-breeding seasons using scat and other biogeochemical analyses (e.g., eDNA, stable isotopes, fatty acid analysis).
- Expand diet studies to include all age/sex-classes of animals (adult females, adult males, and juvenile fur seals).
- Continue to examine the movement patterns and space use of all age/sex-classes during the breeding and non-breeding seasons, including foraging effort, dive patterns, and factors related to rookery departure and return dates.
- Continue to improve estimates of energy requirements for all age classes and sexes of northern fur seals (see McHuron et al. 2020 for initial analysis). Energy requirements by age class and sex can be refined using captive studies, historical estimates, and current diet and foraging studies. These estimates should be applicable and accessible for ecosystem models.



3. A. Monitor and study changes in NFS populations

A.3 Monitor and study changes in diet, foraging behavior, and physiology

Initiatives-Continued

- Examine maternal attendance patterns during the breeding season including foraging trip durations, pup provisioning cycles, energy transfer, and how they relate to pup growth, condition, and survival.
- Continue studies to examine links between diet, foraging behavior, and general condition, health, reproduction, and survival.
- Examine relationships between in food habits, foraging behavior, physiology of all sex/age-classes and changes in oceanographic and atmospheric conditions within foraging habitat (Objective 3 Action C.3) and in relation to fisheries interactions and other anthropogenic disturbances (Objective 2 Action F.1).



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3. A. Monitor and study changes in NFS populations

A.4 Promote joint research and collaborative programs

Initiatives

- Continue and expand comparative studies of fur seals on the Commander Islands, Robben Island, Bogoslof Island and San Miguel Island to evaluate population differences with the Pribilof Islands fur seal populations.
- Foster comparative research between northern fur seals and other Bering Sea and North Pacific marine species.



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3. C. Describe and monitor fur seal habitats and occupancy of those habitats

C.1 Compile and evaluate available terrestrial habitat-use data

C.2 Compile and evaluate available at sea habitat-use, food habits and available fish resource data

Initiatives

- Investigate various surveys and platform of opportunity sighting data to reliably estimate the at-sea density of northern fur seals.
- Investigate the consistency of habitat use over time; incorporate climate predictions (e.g. ACLIM 1 & 2) of environment and fish to assess potential impacts to eastern stock.
- Examine fish stock assessment information and resource availability and relationships to fur seal at-sea habitat use, diet, foraging behavior



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3. C. Describe and monitor fur seal habitats-*cont'd*

C.2 Compile and evaluate available ... data

Initiatives-cont'd

- Characterize the seasonal and temporal relationships among prey resource availability, oceanographic conditions and fur seal foraging.
- Evaluate the practicality of sampling fur seals at sea by various methods in selected parts of their range
 - Focus on detecting changes in diet (prey size and species composition), in condition, growth rates, pregnancy rates, or other biological variables.
- Pelagic sampling designs need to incorporate changes in the quantity or quality of available food (prey) resources.
- Coordinate food habits and foraging location studies with oceanographic surveys to identify and characterize fur seal feeding areas in the Bering Sea, Gulf of Alaska, and the North Pacific Ocean.



3. C. Describe and monitor fur seal habitats and occupancy of those habitats-cont'd

C.3 Conduct oceanographic and fish surveys related to pelagic fur seal habitat use

Initiatives

- Study the natural influences on fish distribution and fur seal feeding ecology in the summer and winter to determine if additional studies are needed to delineate and characterize areas of special biological importance to NFS
- Study the distribution and abundance of commercial and non-commercially utilized NFS prey



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3. D. Identify and evaluate ecosystem changes

D.1 Evaluate carrying capacity

D.2 Continue and regularly evaluate Pribilof Islands Sentinels Program

- Continue standardized data collection through Sentinels Program to enable comparisons among geographic areas and different times of years (standardized protocols developed with NMFS, reviewed/updated annually, new protocols developed as needed)
- Expand the Sentinels Program to other locations Evaluate the Sentinels database regularly and generate meaningful summaries and reports; complete five year (?) reviews of data to evaluate patterns/trends

D.3 Compile and evaluate existing physical environmental data as it relates to fur seal prey distribution and abundance

- **Compile and evaluate existing oceanographic, climate, and environmental data for the Bering Sea and North Pacific**

D.4 Select appropriate environmental indices

- Select the most appropriate environmental indices and sampling schedules, and initiate periodic, long-term sampling programs to detect changes and monitor trends in key components and characteristics of essential fur seal habitats



D. Identify and evaluate ecosystem changes-*continued*

D.5 Quantify environmental effect on fish stocks and fur seal behavior, foraging, and productivity

Initiatives

- Study effects of environmental conditions and climate on pup survival, condition, weaning, and migratory behavior.
- Study effects of environmental conditions and climate on lactating female survival, condition, foraging behavior, weaning, reproduction, and migratory behavior.
- Determine ecosystem linkages between fur seals, other top predators, and the dynamics of commercial and non-commercial prey species (i.e., osmerids, cephalopods).



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D. Identify and evaluate ecosystem changes-*continued*

D.6 Ecosystem modeling

- Determine and undertake such studies and ecosystem modeling as may be necessary based on Objective 3, actions A.2, C.2, C.3, D.3, D.4, D.5, and Objective 2, actions F.1 and F.2 to fill critical data gaps concerning the nature, magnitude, or possible effects of natural changes or long-term trends in the marine ecosystem throughout the northern fur seal range.



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Objective 4. Coordinate and assess the implementation of the conservation plan, based on implementation of conservation actions and completion of high priority studies.

- A. Establish a dedicated Conservation Plan Coordinator position
- B. Develop and implement education and outreach programs
- C. Develop and promote international conservation efforts
- D. Enforce existing regulations



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Next Steps

- peace and love
- Continue comanagement meetings and communication to advance fur seal conservation
- Continue meetings and communication with stakeholders to revise Conservation Plan
- Anticipate draft plan release for public comment in 2022
- Monitor 2022 field season for co-management activities



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Qaġaasakuq, Thank you!



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