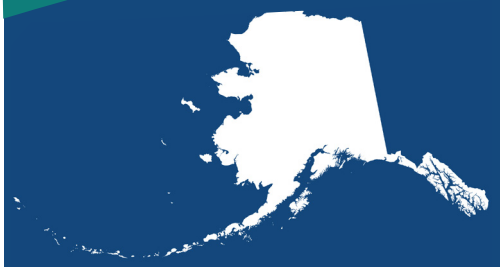
NOAA Fisheries Service
Alaska Fisheries Science Center



Protecting
Conserving
Managing
Marine Resources
in
Alaska

The **Alaska Fisheries Science Center** is a scientific research organization responsible for the development and implementation of NOAA's scientific research on marine resources in Alaska waters. Our research focuses on more than 250 fish and 42 marine mammal stocks off the coasts of the Bering Sea, Gulf of Alaska and Aleutian Islands.

National Marine Fisheries Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

Ringed Seal

Phoca hispida

Length 1.2 m (4 ft) *
Weight 54.4 kg (120 lbs)*
Age 43 years old**
*average
**maxiumum

Range/Habitat

Ringed seals live in polar regions from about 35°N to the North Pole. In Alaska waters, and depending on ice cover, they are found throughout the Beaufort, Chukchi and Bering Seas as far south as Bristol Bay in the southern Bering Sea. These seals use sea ice to rest, give birth, and molt. As such, they are sensitive to changes in the environment that affect the timing and extent of sea ice formation and breakup. Ringed seals prefer areas with high ice cover, either in fast ice along coastal areas, or in the interior ice pack, away from the ice edge. They are believed to remain associated with ice throughout the spring and summer; therefore, their seasonal distribution is constrained by the seasonal advance and retreat of sea ice in the Bering Sea.

Diet/ Role in Ecosystem

The diet of ringed seals includes shrimp, amphipods, euphausiids, squid, sculpins, and arctic cod.

Reproduction

Ringed seals give birth to pups in snow caves (lairs) underneath the snow in shorefast ice in early April.

Population

Reliable estimates for the current minimum population size, abundance and trend of the entire population of ringed seals in Alaska are unavailable. A rough estimate for the number of ringed seals in Alaska is 3.3-3.6 million, based on aerial surveys conducted in the Chukchi and Beaufort Seas during 1985-87. In 1999-2000, the ringed seal population in the Chukchi Sea was estimated at 252, 488 seals.

Research

The Alaska Fisheries Science Center (AFSC) conducted aerial surveys in 1999-2000 to assess ringed and bearded seal distribution and abundance in the Chukchi Sea. Ringed seals were captured and instrumented with satellite tags to assess haulout behavior during the surveys. Aerial surveys of ringed seals were also conducted south of St. Lawrence Island in March 2001.

The population structure of ice-associated seals (bearded, ribbon, ringed and spotted seals) is poorly known, but recent evidence suggests that the pan-arctic ringed seal population may be made up of many demographically isolated stocks. In 2005, AFSC and University of Alaska, Fairbanks, researchers initiated a study to determine whether ringed seals returned to the same breeding locations in successive breeding seasons. The study used satellite-linked data recorders and analyzed genetic samples for homozygosity. If ringed seals remain in isolated populations, results would indicate that permanent immigration rates are low, and therefore ringed seals are more susceptible to the extinction of subpopulations.

Management

The best way to conserve and provide stewardship of marine mammal populations that are critical to the subsistence lifestyle of Alaska Natives is through a full and equal partnership between the federal agency with management authority and Alaska Natives using that resource. The AFSC is responsible for scientific research and stock assessments of ice seals in Alaska, and therefore has expertise and data relevant to many issues of concern of ice seal co-management partners. Recent workshops have resulted in the creation of an ice seal co-management committee consisting solely of representatives of Alaska Native tribes. The AFSC is an active participant in their meetings and is interested in developing a committee where both NMFS and Alaska Natives are equally represented. AFSC staff participates in co-management workshops and meetings to present scientific findings and advice relevant to ice seal ecology and harvest management, and provides financial support for genetic analyses on the stock structure of the four species of ice seals using tissues collected during field research projects.

Issues

Ringed seals are a critical component of the Alaska Native subsistence harvest. There is significant annual variation in harvest numbers; however, the effect of the subsistence hunt on ringed seal populations cannot be assessed, because there are no current and reliable population dynamics and ecological data for these seals. Abundance, population discreteness, annual survival and reproductive rates in the Alaska population (together with information on food habits, seasonal movements, distribution, and habitat requirements for breeding, foraging, and molting) are all unknown, and are essential to making sound management and conservation decisions. Current knowledge of vital rates in ringed seals is insufficient to allow for timely detection of changes in population trends. Without reliable estimates of ringed seal abundance, impacts of human activities on the populations cannot be assessed.

Ecological data is particularly important with regard to the effect of global warming and the resulting change in Arctic ice habitat. A reduction or change in ice cover would directly affect the survival of ringed seals, since they depend on seasonal ice for breeding and haul-out substrate.

Finally, the effect of interactions with commercial fisheries (both direct, such as entanglement in nets, and indirect, such as competition for resources) are not well known. However, given that there is little overlap between the distribution of commercial fisheries and the distribution of ringed seals, it is possible that commercial fishery impacts may be minor. This may change, however, as fisheries continue to move farther northward.

For more information

Species information
http://www.afsc.noaa.gov/nmml/species/species_ringed.php

Research at AFSC:
http://www.afsc.noaa.gov/nmml/species/species_ringed.php#research

Management:
http://www.fakr.noaa.gov/protectedresources/seals/ice.htm

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Questions or Comments?
email: afsc.outreach@noaa.gov