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Scientists Study Weaned Gray Seal Pups on Muskeget and Monomoy Islands

Marine mammal researchers are capturing, tagging, sampling, and releasing weaned gray seal pups on islands near Cape Cod and Nantucket this week. They hope to learn more about the influenza A virus in the gray seal population and fill out a picture of pup movements while gathering samples that will reveal more about stock health, gray seal ecology, and habitat use. Data gathered will also be used to model the population and detect demographic changes.

The eight-day field study is jointly led by researchers from NOAA's Northeast Fisheries Science Center (NEFSC) and MIT. Field work is being conducted January 11-18 on Muskeget Island off Nantucket and on Monomoy National Wildlife Refuge near Chatham on Cape Cod. Researchers hope to sample and flipper-tag 200 pups: 150 on Muskeget and 50 on Monomoy.

Gordon Waring, who heads the seal research program at the NEFSC's Woods Hole Laboratory, is a co-chief scientist for the project. Other lead scientists include Wendy Blay Puryear and Mandy Keogh of MIT. Keogh, a visiting research scientist with the Jonathan Runstadler lab at MIT, is leading two field research teams on Muskeget, and Waring is leading the team on Monomoy.

"The 2015 work continues a long-term collaborative project to understand the health and population of gray seals," Waring said. "We hope to expand sampling at other pupping sites in U.S. waters in future years."

Muskeget, a privately owned and uninhabited island several miles northwest of Nantucket, is the largest gray seal breeding and pupping colony in the U.S. Nearby Monomoy National Wildlife Refuge, an island near Chatham on Cape Cod, is also a primary gray seal haul-out on the U.S. East Coast although the number of pups born there is much lower than on Muskeget.

Gray seals and harbor seals are the most common seal species on Cape Cod and the Islands; gray seals are resident year-round while harbor seals are primarily seasonal residents, present from fall through early spring before migrating north in the summer.

Mid-December to early February are prime pupping months for gray seals. Gray seal pups that have been weaned remain on the islands for several weeks until they molt or shed their white coat, known as lanugo, for a darker fur coat or pelage.

During the course of the study field researchers are rotating among the two teams on Muskeget and one at Monomoy. The teams will capture pups on land; no captures will be made in the water.

Once captured, each weaned gray seal pup is measured and weighed. Biological samples, including blood, mucus swabs, hair and skin, are being taken for use in health assessments and in stable isotope, contaminant and genetic research. All seals are being outfitted with numbered flipper tags for identification. One to three seals are also being fitted with satellite tags that gather and report data on movements and behavior over time.

Once the biological sampling and tagging work is completed, the seals are released. The entire process for each seal, from capture to release, usually takes about 10-15 minutes, or up to 30 minutes if a satellite tag is attached.

Many of those on the scientific team, including Waring and other NEFSC staff, worked together in January 2014 on similar studies on Muskeget involving weaned gray seal pups. MIT scientists Jonathan Runstadler, Wendy Blay Puryear and Nichola Hill are studying influenza viruses in seals and how research in wild animals can benefit public health. The Runstadler laboratory has been studying weaned gray seal pups on Muskeget Island each January since 2013; 99 were sampled in January 2013, and 103 pups were sampled in 2014.

Several years ago a large number of young harbor seals were found dead along the New England coast, and an avian influenza virus was present and isolated. Outbreaks of the influenza A virus, one of three types of influenza viruses, have occurred in dogs, horses, pigs and marine mammals. The presence of influenza A in seals was first recognized in 1980 and appears to be associated with intermittent mortality events along the northeastern Atlantic coast. While illness and death due to influenza is not commonly reported in marine mammals, the population level significance of influenza A in marine mammals is unknown.

Puryear has studied virus-host interactions for more than 12 years and recently joined the MIT team where she has begun studying gray seal pups to understand the basic immunology, evolution and ecology of influenza viruses in the wild. Information gathered from studies of gray seals and other animals will help researchers understand the ecological relationships that drive transmission and persistence of influenza in wild species. That understanding may help develop predictive models and ultimately vaccines and other strategies to help mitigate future threats of influenza to human and animal populations.

“Wild waterfowl, shorebirds and gulls are recognized as a natural reservoir for influenza viruses which have frequently spilled over to and become established in other species, including humans,” said Runstadler. “Marine mammals share habitat with many of these species and appear to carry numerous strains of influenza. Our work aims to understand how the evolution and adaptation of influenza virus is being impacted by seals and their interaction with birds in the environment.”

All personnel handling seals wear protective gear and take precautions when collecting samples from marine mammals in any research effort, and this study is no exception.

The Cape Cod National Seashore’s National Park Service is providing a boat, operator and some equipment to assist with the team working at Monomoy. The refuge is also allowing the team to stay at the island’s lighthouse. Along with a small boat from the NEFSC’s Woods

Hole Laboratory, two local boat operators with knowledge of the shoals around Muskeget are volunteering their services to transport personnel and equipment between Nantucket and Muskeget for the field study.

The scientific team comprises researchers from NOAA's Northeast Fisheries Science Center (NEFSC), Massachusetts Institute of Technology, Mystic Aquarium, New England Aquarium, Marine Mammals of Maine, University of Connecticut, University of Rhode Island, University of New England, Riverhead Foundation for Marine Research and Preservation, National Park Service, National Marine Life Center, and Woods Hole Oceanographic Institution/Northwest Atlantic Seal Research Consortium.

The team has a marine mammal scientific research permit issued by NOAA's National Marine Fisheries Service (#17670-02) to the Northeast Fisheries Science Center, and Monomoy National Wildlife Refuge special use permit (#53514-130003) to work on that island.

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Related links:

Seal Research at NEFSC: http://www.nefsc.noaa.gov/psb/seals/

Influenza A in Marine Mammals Fact Sheet (NOAA pdf): mmflu.pdf

2013 Gray Seal Tagging in Chatham:
http://www.nefsc.noaa.gov/psb/seals/GraySealCapture2013.html

Scientists to Try Cape Cod's First Tagging and Sampling Effort on Adult Gray Seals:
http://www.nefsc.noaa.gov/press_release/2013/News/NR1305/

Seals: http://www.nefsc.noaa.gov/ecosys/ecology/ProtectedSpecies/Pinnipeds/

Gray seals: http://www.nmfs.noaa.gov/pr/species/mammals/pinnipeds/grayseal.htm