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NOAA Fisheries Kicks Off Hawaiian Monk Seal Vaccination Drill

From July 15 through July 17, the Hawaiian Monk Seal Research Program (HMSRP) of the NOAA Pacific Islands Fisheries Science Center will be conducting a vaccination drill spanning Oahu and the Northwestern Hawaiian Islands.

Certain virus-borne infectious diseases could potentially devastate the population of Hawaiian monk seals if an outbreak ever occurs, bringing the critically endangered animal even closer to extinction.

To combat this potential threat to Hawaii's state mammal, HMSRP has developed a response plan for the emergency vaccination of the Hawaiian monk seals in both the main and Northwestern Hawaiian Islands, which HMSRP may enact if it discovers a seal with a suspected or confirmed case of an infectious viral disease.

This vaccination response plan is in addition to the regular vaccination efforts HMSRP staff will conduct on the seals they handle during research activities in the future.

The drill will help HMSRP train staff and volunteers for a real emergency vaccination, see how many monk seals can be vaccinated within two days, and identify any gaps in the protocols, communications, and data collection procedures of the response plan.

The looming threat of viruses

Morbilliviruses, a family of viruses that includes measles in humans and canine distemper virus, are the main viral threat to Hawaiian monk seals that HMSRP is targeting. The program is also looking at West Nile virus as a potential issue.

To date, morbilliviruses have not infected any Hawaiian monk seals, but the viruses have caused massive die offs of other phocids (various seals of the family Phocidae characterized by short fore flippers, hind flippers specialized for swimming, and the absence of external ears).

In 1988, for example, phocine distemper virus wiped out about 70 percent of the population of harbor seals in Europe's North, Baltic, and Irish seas. In 2002, another outbreak of similar magnitude erupted among the harbor seals in the North Sea.

Canine distemper virus — which can actually affect a wide range of non-canine species, including some primates, pandas, ferrets, raccoons, and phocids — has also ravaged seal populations. It killed up to 10,000 Baikal seals in the late 1980s, and another 10,000 Caspian seals during an outbreak in 2000.

There are other types of morbilliviruses that can also pose a threat to seals, such as cetacean morbillivirus.

Morbilliviruses are spread through the air, and can be passed from seal to seal through sneezing. A seal can also catch it from other animals, such as through interactions with dogs.

"But it doesn't have to be from dogs," says Michelle Barbieri, HMSRP health program coordinator. "If there's a dying whale on the beach that is sending the virus out into the air, an adjacent seal might catch it."

Morbilliviruses typically affect the lungs and brain of sick animals, resulting in symptoms that can include:

- Respiratory difficulties from pneumonia
- Abnormal behavior
- Skin lesions
- Brain infections

HMSRP has identified a potential vaccine for morbilliviruses, which tests on captive Hawaiian monk seals show to be safe for the pinnipeds.

West Nile virus, on the other hand, is only transmitted through the bites of mosquitos. The virus is not present in Hawaii and not known to have affected any wild marine mammals, but it is present in southern California and has killed a captive monk seal in Texas, suggesting it's a potential threat to Hawaiian monk seals.

Preparing for the worst

From 9am to 11am HST on July 15, the first official day of the drill, HMSRP will be holding a webinar to describe the purpose of the vaccination plan and drill, illustrate its implementation, discuss known limitations, and answer questions submitted real-time via email or in person at the Inouye Regional Center on Ford Island, Honolulu.

Following the webinar, drill participants will receive further instruction and training about their respective duties during the next two days of the exercise.

On July 16, HMSRP staff members and volunteers — 40 on Oahu and 15 in the Northwestern Hawaiian Islands — will break into groups and search for seals in predetermined zones.

They will identify each seal found using tags and known seal-specific markings, and then determine if the seal should be vaccinated or not. In a real-world scenario, for instance, nursing pups, sick seals, and seals vaccinated within the last 21 days would not be vaccinated.

They will photograph and log each seal, and determine the best plan of action for vaccinating the seals (particularly important in cases where there are multiple seals in a single area). However, no seals will actually be vaccinated during the drill.

Group members will report all "vaccinated" seals back to folks in the command center on Ford Island, who will be keeping track of the overall vaccination progress. The command center will also be taking calls from group members, answering any vaccination questions and helping to resolve any issues.

This scenario will be repeated again on July 17, during which group members will have to take more precaution regarding which seals they "vaccinate" to make sure they don't double-up on any animals.

This two-day field procedure will not only inform HMSRP about how many seals can quickly be vaccinated, but also help answer the question of how many days are really necessary to vaccinate all of the seals in Hawaii.

"That's one of the questions we still have hanging in the balance," Barbieri says. "It will be probably answered by seeing how many seals we can vaccinate in day two compared with day one."

Importantly, she adds, the morbillivirus vaccine requires a booster shot (given about a month after the initial shot), and the drill will also help HMSRP prepare for widespread booster administration.

