



Marine Mammal Health and Stranding Congressional Briefing Summary

Background

Marine mammal strandings often occur in populated coastal areas, raising public concerns about their causes and likely human health and economic impacts. Those impacts can be direct (i.e., contact with sick and dying mammals on the beach) or indirect (i.e., water quality or seafood safety). The scientific information gleaned from stranded animals is essential to assessing direct and indirect impacts, as it provides valuable insights into marine mammal health and disease and the integrity of the marine environment.

On August 1, 2013, the Marine Mammal Commission and NOAA's National Marine Fisheries Service hosted a Congressional briefing at the U.S. Capitol Visitor Center in Washington, D.C., to discuss the major trends and issues involved with marine mammal strandings, and the ways in which federal and private stakeholders are working collaboratively to address these challenges.

Moderators

- Dr. Daryl Boness, *Chairman, U.S. Marine Mammal Commission*
- Ms. Donna Wieting, *Director, Office of Protected Resources, National Marine Fisheries Service*

Panelists

- Dr. Frances Gulland, *Commissioner, U.S. Marine Mammal Commission*
- Ms. Nicole LeBoeuf, *Chief, Marine Mammal and Sea Turtle Conservation Division, National Marine Fisheries Service*
- Mr. W. Mark Swingle, *Director of Research and Conservation, Virginia Aquarium & Marine Science Center*
- Dr. Charles Littnan, *Lead Scientist, Hawaiian Monk Seal Research Program, Pacific Islands Fisheries Science Center, National Marine Fisheries Service*

Event Summary

*Note: The summary below presents highlights from individual speaker presentations. Full presentations for each of the panelists below are available via download from the Marine Mammal Commission website:

http://www.mmc.gov/special_events/mmhsrp_briefing/mmhsrp_briefing.shtml

Welcome and Introductions

Ms. Donna Wieting, Director of the Office of Protected Resources, NOAA National Marine Fisheries Service, moderated the briefing. She began the briefing by welcoming the audience members and providing a brief introduction for each of the panelists. Ms. Wieting then turned the podium over to Dr. Daryl Boness, Chairman of the Marine Mammal Commission, to present a few introductory remarks.

Introductory Remarks

Dr. Boness provided an overview of the Marine Mammal Commission and its mission to provide oversight and advice to federal agencies regarding the primary objective of the Marine Mammal Protection Act (MMPA) – to ensure the conservation of marine mammals and maintenance of healthy ecosystems of which they are a part. Dr. Boness discussed the complexity of marine mammal stranding events – they may include individuals or multiple animals over brief or long periods of time, may involve one or more species, and the causes may be direct (e.g. caused by a ship strike, or entanglement in fishing gear) or may be more subtle or a combination of factors, making it difficult to ascertain the cause of the stranding. Dr. Boness also noted the Commission has been a long-standing supporter of the National Marine Mammal Health and Stranding Response Program coordinated by NOAA's Fisheries Service, as it provides crucial data about marine mammal populations and changes in their environment, as well as a mechanism for leveraging public-private partnerships and dealing with impacts of large-scale catastrophic events such as the oil spill in the Gulf of Mexico.

Marine Mammal Strandings and Implications for Ecosystems and Human Health

Dr. Frances Gulland, Commissioner for the Marine Mammal Commission and a veterinarian for the Marine Mammal Center in Sausalito, CA, provided her perspective on trends in marine mammal health and strandings, and the implications for ecosystems and human health. Over the past 15 years, more than 50,000 marine

mammal strandings have occurred along U.S. coastlines, and 7,000 of these animals survived and have been released. While these events understandably raise public concern over the welfare of the animals, they also provide a way for us to better understand their biology and ocean habitats. For example, stomach samples can help scientists understand what kinds of prey marine mammals eat, and hence provide information on various fisheries interactions. Dr. Gulland also noted that marine mammal strandings have implications for human health – these animals are susceptible to many of the same diseases and toxins that humans are. In 2011, 162 seals died in Maine, New Hampshire, Massachusetts, and other areas of the Northeast in an Unusual Mortality Event caused by H3N8 avian influenza virus. Other recent cases of zoonoses, or diseases transmittable between animals and humans, include 25 percent of dolphins stranded in the Gulf of Mexico over the past several years that have tested positive for Brucellosis.

Dr. Gulland also noted that marine mammal health can act as an indicator of ocean change, particularly the impacts of anthropogenic activities such as coastal development, pollution, shipping, or fishing activities. Coastal urbanization can result in increased run-off and introduction of pollutants and pathogens – for example, 11-22 percent of sea otters die of encephalitis, or brain inflammation, caused by two protozoan parasites that occur in terrestrial hosts. Harmful algal blooms, enhanced in some areas by coastal run-off, have resulted in domoic acid poisoning in California sea lions. These animals were affected by eating anchovies and sardines containing the toxin. State public health monitoring typically measures toxin levels in mussels to determine public health risk – the indication of domoic acid poisoning in sea lions arose at least a month before the state found similar levels in its tests.

Marine mammal strandings can provide data on the efficacy of efforts to mitigate harm and mortality to marine mammals from human ocean uses. Dr. Gulland noted that the effectiveness of ship speed reductions can only be determined if stranded whales are examined to determine whether their cause of death was a collision with a ship. Similarly, the effectiveness of measures to reduce the impacts of fishing gear and sonar or blast injuries can be monitored by examining stranded animals.

Marine Mammal Health and Stranding Response Program

Ms. Nicole LeBoeuf, Chief of the Marine Mammal and Sea Turtle Division at NOAA's Office of Protected Resources, presented an overview of NOAA's Marine Mammal Health and Stranding Program (MMHSRP). The MMHSRP was established in 1992 by Title IV of the MMPA, and includes a diverse set of activities that include stranding response; rehabilitation and release; entanglement response; health, risk, and injury assessments; disease and unusual mortality event (UME) investigations; tissue bank

development and quality assurance; the Prescott Grant Program; and oil spill preparedness and response. Ms. LeBoeuf presented each of these components of the MMHSRP, including work to aid the investigation of a Northern Gulf of Mexico UME, which has resulted in 1,026 stranded cetaceans (5% live, 95% dead) since 2010, most of which have been bottlenose dolphins. As part of the MMHSRP, the Prescott Grant Program coordinates the review and selection of grant applications and administers awards. Between 2001 and 2012, 471 grants were awarded to stranding network partners in 25 states, two territories, and the District of Columbia. The Atlantic Large Whale Entanglement Response program studies large whale entanglement in fishing gear, focusing primarily on the critically endangered North Atlantic right whale. The program also helps disentangle small cetaceans, such as dolphins, from fishing gear.

Perspective from the National Marine Mammal Stranding Network

Mr. W. Mark Swingle, Director of Research and Conservation at the Virginia Aquarium & Marine Science Center, provided a perspective from the nation's Marine Mammal Stranding Network. The Stranding Network is composed of more than 100 organizations, mostly private and non-profit volunteer groups, and covers all coastal states of the U.S., including Hawaii, and territories such as Puerto Rico. The Network's members respond to more than 5,000 marine mammal strandings each year, and the number continues to grow.

As Mr. Swingle noted, the Network members provide the "boots on the ground" for NOAA Fisheries and the MMHSRP. Operating at the grassroots level with networks of professional staff and trained volunteers, Network members operate on a 24/7 basis and are the first responders to marine mammal stranding events, and first to encounter the clues to emerging diseases, anthropogenic threats, and environmental impacts. Marine mammal stranding events naturally capture public attention, and therefore, attention from the media. Network members also represent the public face of the MMHSRP, and can provide powerful conservation learning experiences for the public during their response activities. With assistance from the MMHRSP, network members have the trained personnel and equipment needed to respond to large whale strandings, mass stranding events, or even large-scale environmental disasters such as the Deepwater Horizon Gulf oil spill. Mr. Swingle also noted that the Prescott Grant Program has supported around 100 organizations, and since it was established as a matching grant program, it has leveraged nearly \$15 million in non-federal funding to support marine mammal health and stranding response. The Network also provides data collection and sampling, to help NOAA monitor the effectiveness of regulations and other protections for marine mammals to minimize harm from fisheries interactions, ship strikes, and Naval training exercises.

The Role of MMHSRP in the Recovery of Hawaiian Monk Seals

The final panelist, Dr. Charles Littnan, Lead Scientist for the Hawaiian Monk Seal Research Program at NOAA's Pacific Islands Fisheries Science Center, talked about how the MMHSRP has helped recovery efforts for one of America's most endangered marine mammals, the Hawaiian monk seal. The Hawaiian monk seal is critically endangered, the population has been in decline since the 1950s and there are currently only around 1,100 seals left. Dr. Littnan noted that there are two distinct conservation challenges for Hawaiian monk seals – in the remote, uninhabited Northwestern Hawaiian Islands where most of the population lives, ecological conditions have deteriorated to the point where seals are struggling to survive, whereas in the Main Hawaiian Islands, a small but growing population of seals must contend with human interactions and the threat of disease. The primary objective of NOAA's Hawaiian monk seal program is to identify and mitigate sources of mortality for seals, whether through translocations of juvenile seals to areas of higher survival, or captive care and rehabilitation, and medical care in the wild. The MMHSRP has played a critical role in Hawaiian monk seal recovery efforts – nearly 40 percent of all interventions are related to health and stranding issues, and nearly 30 percent of all Hawaiian monk seals alive today are so due to NOAA's efforts. Dr. Littnan pointed out that the monk seal program also benefits indirectly from having a coordinated, national stranding response program. The MMHSRP develops expertise outside of Hawaii that can be imported and applied to monk seals, for example best practices in captive care and emergency response for pinniped species, and disease detection in other marine mammals such fur seals that may pose a threat to monk seals.

Question and Answer Session

Following the panelist presentations, the briefing concluded with a short question and answer session moderated by Ms. Wieting. The following are highlights of questions raised by audience members and answers from the panel.

- *What new strategies are needed to deal with the recent rise in marine mammal strandings, and what kind of Congressional Response is needed to help deal with these events?*

Regardless of what happens with the future of the MMHSRP, people will continue to respond to marine mammal strandings because of the public's interest in marine mammals, animal welfare, etc. – the real question concerns the capacity of the response organizations, and what quality of care the animals would receive. For example, if no care facility is available, then animals might have to be euthanized. Or if a care facility is available, would the animals receive poor care because there is not enough training? These are the sorts of questions

that will be faced. One area where Congress could help is the need for a coordinated, national strategy for integrating health assessments with ecosystem monitoring. It sounds complex, but a simple way to think about it is in terms of an analogy to human health. Without a coordinated, national stranding framework, it is like having an emergency ward without having something like the Centers for Disease Control (CDC). For example, when people start getting sick from a food-borne pathogen, the CDC can take this information and create a map to see patterns across the country. This is what is currently missing with assessing marine mammal health. To get to that next step, it will take a coordinated national strategy with some investment and support from Congress.

- *Could you speak a little more to the importance of the Prescott Grant Program in the day-to-day work of the Stranding Network, and what capacity might be lost without future funding?*

In terms of what the program has done for members of the Stranding Network, it has really been transformative – the Prescott program was really a game changer and elevated the professionalism in the network, it improved members' ability to collect data, and it improved the agency's (NOAA's) ability to utilize the network's resources in better ways, to provide better stranding information. The data collected during stranding events today are much different than the data collected 15 years ago, and a lot of that is a result of the Prescott stranding grant program. In terms of funding, many of the Stranding Network members have been pondering this question. Prescott program grants are a significant portion of the budget for a lot of organizations, for example it's around 25-30 percent of the annual operating budget for the Virginia Aquarium & Marine Science Center's stranding response program. That percentage is higher for some other organizations, which may not survive if the program goes away. Prescott grant funding does not provide anywhere close enough to fund the entire marine mammal stranding network, however it does provide an important contribution from the federal side and creates a partnership between the Network and the federal government for marine mammal protection and resource management.

- *Regarding the determinations with stranded animals in terms of their ultimate fate, i.e. whether they are euthanized, and whether they are eventually returned to the wild – who makes those decisions and what is the process for coordinating that decision-making?*

The veterinarian who is responsible for the animal's care and rehabilitation ultimately makes the decision based on the animal's medical status and whether it is treatable or not (and hence whether it should be euthanized) and if treatable,

whether it is releasable once it has recovered from its ailments. There are situations where an animal recovers, it can eat and move around, but would not be able to survive in the wild. For example, in California, responders often see animals that are blinded by a gunshot. The animals have slowly gone blind over time, so that they were able to adapt to their condition and are able to find their way around a pen or a pool. However, they would not be able to successfully migrate or catch fish in the wild and survive. So the veterinarian would declare the animal non-releasable due to medical reasons, and then NOAA and the care center would try to find a home for that animal, placing it in a suitable display or research facility. There are places that want to provide a home for these animals, and they apply to NOAA and describe their reasons for wanting to host the animal, the housing they can offer, etc., that's how it works.

- *A presentation was recently given about how the Hawaiian monk seal recovery program is using "Critttercam" to better understand the food that monk seals eat – how will that information be used in the recovery of Hawaiian monk seals?*

Primarily, that project is approaching recovery from a different angle, trying to address some myths and misconceptions in terms of the seals and what they are eating. There is this idea of monk seals coming back to the Main Hawaiian Islands – some fishermen and ocean users don't quite understand what the impact of these seals will be as the population continues to grow. So there are some concerns, but often the concerns have been magnified and perpetuated by misconceptions about what seals eat and do not eat. So NOAA has partnered with National Geographic and community members and NGOs to start putting cameras on the backs of seals. It's been incredibly powerful to dispel this idea that monk seals eat everything they see, and are depleting fisheries, and the classic seal vs. fishermen type of tension. The project is very early in terms of sharing the data, but its going to be going on for the next couple of years, and hopefully it will temper a lot of the fears and animosity in the Main Hawaiian Islands and will cut down on the events of intentional harassing, harming and killing of the seals that we're seeing right now.

- *There was some discussion on the panel about zoonosis, and transmission of disease between animals and people. Are there real public health risks from animals that wash up on the beach, and what's the best methodology for disposal?*

Yes, there are definitely real public health issues – there are many cases where people have gotten sick. There are lists out there of diseases that are transmittable between marine mammals and people. In terms of disposal of dead

animals, the best thing is to bury it so it doesn't come back. If you tow an animal out to sea, it might float back. So burial and incineration are the best methods, neither of which is really easy if you're talking about a large whale.

- *In terms of the impacts of sound produced by underwater seismic surveys, is there is any sort of toolkit for understanding whether underwater sound was involved with an unusual mortality event (UME)? Or is the UME process not the right framework to use for identifying impacts, if the hearing loss or injury to an animal occurs over a longer period of time, and would not result in a large scale UME?*

With respect to assessing the impact of sound to the animal, there have been really two types of health impacts that have been observed. The first example is the dramatic events you usually see where groups of animals have washed up on shore in response to sound, whether sonar, or air guns – these have actually been outside the U.S. in places like the Bahamas or the Canary Islands. Often they are certain species that are known to be particularly susceptible, such as species of beaked whales. In those cases, if the strandings had happened in the U.S., it would have been declared a UME. When that happens, the animals would be very thoroughly necropsied. All their tissues are examined, and they have a MRI or CT scan to detect gas bubbles or embolic histology – those are effective ways to detect damage and are what is underpinning of some of our knowledge of impacts of sound on deep-diving animals. It appears these animals develop a bends-like syndrome in response to being disturbed and then they are not completing their usual decompression dives, so it is a combination of a behavioral response resulting in the bends and then death. Again, this is the example of an unusual dramatic event with a cluster of 3 or 4 whales. NOAA has a panel of experts who are called in to look at potential causes of a UME event – it's almost like a "CSI" kind of approach. These people try to understand what could have been the impact, and what could have been the effects, that could have caused the animals to strand.

The second concern is the effect that the general increase in ocean noise, whether from ships, or sonar noise, is having on an animal's hearing ability. Really the only way you can get at hearing ability, is by testing a live animal. It's an opportunistic process, and thus happens slowly, one animal at a time. The marine mammal community is slowly building up data on what are the hearing ranges and abilities of these different species, and there are great differences between species. For some species there are a few animals in captive settings, such as the Navy's marine mammal program where we can learn about their normal hearing,

but otherwise it is a slow process – you have a stranded animal and an opportunity to test its hearing.

This is another example of where we really need to have a nation-wide health monitoring effort that is coordinated on the national scale. This is another benefit of Prescott grants, when NOAA has a national grant program, it plays a really important coordinating role by collecting marine mammal health data in a central location. Stranding Network members are the first responders to these types of events, and have protocols in place where they can take specific samples from animals that are known to be potentially susceptible to sound. This is the benefit of a functioning stranding network – it is a monitoring and assessment tool, and provides samples and other materials for marine mammal researchers that are studying these issues in depth. In general, the MMPA tends to focus its direction to NMFS toward the mitigation of interactions between fisheries and marine mammals, and rightfully so, but this particular aspect of the MMPA (the MMHSRP) recognizes that threats to marine mammal conservation and recovery go far beyond fishery impacts, and help provide important information on other threats like ship strikes and hearing loss from noise – things that are often much harder to detect than animals caught in a fisherman's net.

Closing remarks

Dr. Boness ended the briefing by providing some closing thoughts and observations on the issues discussed. He noted that stranded animals provide valuable and essential data that help us understand ecosystem health and marine mammal health, and basic life-history information for some species that are otherwise difficult to study in the wild. For some species like Hawaiian monk seals, stranding response programs can be an important tool in the recovery of endangered marine mammals. Strandings can provide important information on the effectiveness of marine mammal conservation and mitigation measures, such as gear restrictions, time/area fishing closures, or ship speed regulations. Strandings can also provide valuable information about pollutants and diseases in our watersheds that can lead to health issues with marine mammals and also have impacts on human health. Dr. Boness also noted that as part of the MMHSRP, the Prescott Grant Program has provided valuable support for marine mammal health and stranding response efforts, and facilitated private-public partnerships, leveraging public funding to obtain matching private funding. He ended by indicating there is a critical need for a national strategy to deal with marine mammal health and stranding information and to incorporate it into a broader ecosystem framework.