and synthesizes globally available marine mammal occurrence information within a single conceptual framework and can be a useful tool to prioritize areas that warrant intense research and management focuses.

## A Voluntary Mechanism of Protection from Airborne Noise in a Harbor Seal

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We conducted two series of experiments designed to assess the effects of noise on hearing sensitivity in a harbor seal (*Phoca vitulina*). In the first series, temporary threshold shifts (TTS) were induced at octave-band noise levels of about 97 dB SPL (re 20 μPa) and above. Onset of TTS was determined to be at a sound exposure level of about 131 dB SEL (re (20 μPa)$^2$s), and growth of TTS was determined using a modified exponential model to be between 1.5 and 2 dB/dB of noise. In the second test series, conducted more than one year after the first, no significant TTS was observed at noise levels of up to 106 dB SPL. Results of further experimentation showed that TTS onset had shifted to approximately 158 dB SEL, while growth of TTS and baseline hearing sensitivity remained essentially the same as in the earlier test series. Observations made during noise exposure showed that in the second series of experiments, the subject was able to open and close the opening to the external auditory meatus. Closure of the meatus during loud noise events may explain the nearly 30 dB difference in sound exposure levels needed to induce TTS, and suggests that some pinnipeds may learn to utilize protective mechanisms to reduce their exposure to environmental noise. This finding is important in light of concerns about the effects of anthropogenic noise on marine mammals.

## Effects of Commercially-Available Acoustic Alarms, Designed to Reduce Small Cetacean Bycatch in Gillnet Fisheries, on the Behaviour of North Sea Fish Species

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World-wide many cetaceans drown incidentally in fishing nets. To reduce the unwanted bycatch in gillnets, pingers (acoustic alarms) have been developed that are attached to the nets. In the European Union pingers will be made compulsory in 2007, as long as their use does not reduce the fishermen's catch and does not disturb non-target fish species. In this study, the effects of seven presently commercially-available pingers on the behaviour of five North Sea fish species in a tank were quantified. The species tested were: sea bass (*Dicentrarchus labrax*), pout (*Trisopterus luscus*), thicklip mullet (*Chelon labrosus*), herring (*Clupea harengus*), and cod (*Gadus morhua*). The fish were housed as single-species schools of 9-13 individuals in a tank. The behaviour of fish in quiet periods was compared with their behaviour during periods with active pingers. The results varied both between pingers and between fish species. Sea bass decreased their speed in response to one pinger and swam closer to the surface in response to another pinger. Mullet swam closer to the bottom in response to two pingers and increased swimming speed in response to one pinger. Herring swam faster in response to one pinger, and pout and cod (close relatives) showed no behavioural responses to any of the pingers. Of the seven pingers tested, four elicited responses in at least one fish species, and three elicited no responses. Whether similar responses would be elicited in these fish species in the wild, and if so, whether such responses would influence the catch rate of fisheries cannot be derived from the results of this study. Based on the limited number of fish species tested, the present study suggest, that the higher the frequency of a pinger, the smaller the chance that its sounds have an effect on the behaviour of fish.

## HAL Meets Flipper: Modeling of Marine Mammal Vocalizations in High-dimensional Semantic Space

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The Hyperspace Analog to Language (HAL) model analyzes language in humans by encoding the complex statistical, grammatical, and semantic regularities in language input using a global lexical co-occurrence learning algorithm. HAL has been used to account for a broad range of cognitive phenomena and has been shown to be robust over a variety of languages (Burgess 1998). HAL and a Simple Recurrent Network (SRN; Elman 1990) were used to quantify contextual relationships in marine mammal vocalizations, primarily that of the bottlenose dolphin (*Tursiops truncatus*). Networks such as these are able to incorporate contextual relationships both before and after each "word," and are able to incorporate behavioral context with vocalizations. Some challenges to building these models will be discussed, and preliminary data will be presented. *References: Burgess, C. 1998. From simple associations to the building blocks of language: Modeling meaning in memory with the HAL model. Behavior Research Methods, Instruments, & Computers 30:188-198.; Elman, J. L. 1990. Finding structure in time. Cognitive Science 14:179-211.*

## Skiff Surveys of Northern Sea Otters Within Tribal Boundaries in Alaska

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Since 1998, TASSC has worked with Alaskan Tribal Governments to count northern sea otters (*Enhydra lutris kenyoni*) in their Tribal boundaries to determine sea otter population trend. These surveys are conducted via skiff using standardized methods by traveling along the shoreline. One aspect of the skiff survey is the incorporation of local and traditional knowledge into survey design. Native peoples have information passed on to them by their fore-fathers who have hundreds of years marine mammal observation within their Tribal boundaries. From 2003 to 2005 TASSC worked with eight tribes in the following areas on these surveys: Cordova, Yakutat, Unalaska, Craig, Hydaburg, Port Graham/Nanwalek, Port Heiden and Chignik Lagoon. The surveys were conducted by trained Tribal members in proximity to their local communities. In 2005, approximately 1324.4 miles of coastline were surveyed. Cordova, Yakutat and Unalaska and Port Graham have the longest time series of data. Cordova began their surveys in 1998; Yakutat, Unalaska and Port Graham/Nanwalek began their surveys in 1999, 1999 and 2000 respectively. Results from Cordova, Unalaska and Port Graham indicate a gradual increase in the amount of sea otters sighted since the surveys began. Yakutat survey data shows a stable to a slightly decreasing trend. However, shoreline counts are influenced by Yakutat Bay being shallow enough where otters congregate in the middle of the bay. In Chignik Lagoon, surveyed were conducted in the spring of 2003 and 2004, and the fall of 2004. The spring surveys show a stable trend over that time period. No trend can yet be determined for Craig, Hydaburg, or Port Heiden. During 2005, Craig surveyed 239.1 miles of coastline sighting 963 otters. Hydaburg surveyed approximately 112 miles sighting 437 otters. Port Heiden surveyed in the summer and fall of 2004, sighting 20 and 53 otters respectively.

## Humpback Whale (*Megaptera novaeangliae*) Site Fidelity on Jeffreys Ledge and Mount Desert Rock: Biological and Physical Oceanographic Influences

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