

### Spatial distribution of the southern form of the short-finned pilot whale (*Globicephala macrorhynchus*) in the North Pacific

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The spatial distribution of the southern form of the short-finned pilot whale in relation to the oceanographic (temperature and salinity at surface, 100 and 200 m depth) and the topographic variables (depth, slope, and distance to coast), was investigated using generalized linear models (GLMs) and Ecological Niche Factor Analysis (ENFA) with median, geometric mean, and multinomial algorithms. These models were applied to sighting survey data collected during summers between 1983 and 2006 in the North Pacific Ocean. The spatial distribution of the pilot whale was estimated within the subtropical gyre by these models. Among the environmental variables used to construct the habitat models, the temperature at 200 m contributed most to both GLM and ENFA. This corresponds to the facts that the species mainly feeds on mesopelagic prey and the axis of the Kuroshio, in the northwestern part of the subtropical gyre, is characterized by its temperature at 200 m (14°C). The area under the receiver operating characteristic curve derived from GLM was higher than those from ENFA with three algorithms, whereas the Boyce Index tended to be higher with ENFA than with GLM. These results suggested that GLM defined the core habitat well and ENFA more correctly estimated the suitable habitat. The links between the habitat of the pilot whale and its physical environments were further supported by the mesoscale analyses. The habitat models indicated interannual variations in the coastal habitat of the pilot whale off southern Japan, which were significantly correlated with the path patterns of the Kuroshio. It is considered that spatial and temporal variability in the oceanographic environment influences the distributional patterns of the southern form of the pilot whale both directly or indirectly through its effect on the food webs in the Kuroshio region and the entire subtropical region.

### Differences in melon-headed whale (*Peponocephala electra*) whistle characteristics between sympatric populations in Hawaii

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Melon-headed whales (*Peponocephala electra*) are found throughout the tropics, primarily in pelagic waters but with some being found near-shore around oceanic islands. This species is considered to be sensitive to sound, with one near-mass stranding event in Hawaiian waters associated with a naval exercise. However, relatively little is known of the acoustic behavior of this species. Here we combine multiple passive acoustic tools, including suction-cup attached acoustic tags (DTAGs) and a broadband recorder, the DMON, to gather baseline, broadband bioacoustic behavior data for melon-headed whales. Further, two distinct melon-headed populations are compared: the Kohala resident population (KRP) and the Hawaiian Islands population (HIP). DMONs recorded from a towfish and drifter buoy setup. Three animals were tagged, two from the KRP population (estimated group sizes 280 and 350

individuals) and one from the HIP population (estimated group size of 350 individuals). In total, 1096 and 329 whistles have been identified from the KRP and HIP tag recordings, respectively. Analyses included spectral and temporal characteristics of the whistles, variability of these signals and whistle type categorizations. Data suggest variation between melon-headed whale populations in whistle duration (mean: KRP – 0.99 s; HIP – 0.75 s), start frequency (mean: KRP – 5.1 kHz; HIP – 5.8 kHz), end frequency (mean: KRP – 4.8 kHz; HIP – 11.5 kHz), peak frequency (mean: KRP – 5.5 kHz; HIP – 7.6 kHz), and centroid frequency (mean: KRP – 7.7 kHz; HIP – 10.1 kHz). No overlap in whistle type was apparent between or within populations, which suggests that individual animals may produce semi-stereotyped calls. These are the first broadband comparisons of melon-headed whale signals. The whistle characterization differences suggest automatic detection and classification algorithms can be used to identify melon-headed whales in Hawaiian waters.

### Demographic Structure and Social Behavior of the Unique Mediterranean monk seal (*Monachus monachus*) colony of the colony of the Island of Gyaros

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The Mediterranean monk seal is one of the most endangered and least understood marine mammals on the planet. Fewer than 600 individuals are estimated to survive, the majority of which at remote and inaccessible locations in Greece. Following the discovery in 2008 at the island of Gyaros of one of the most important populations of the species, we set out to document the demographic structure, behavior, and habitat use and suitability of this population during the reproductive season of 2011, using infrared cameras and field surveys. In six months of systematic monitoring efforts we recorded more than 90,000 images, identified at least 25 different individuals of all sex and age classes and documented two births, aggressive interactions between females, fostering and suckling events. During our field surveys we documented also on several occasions monk seals using open beaches for resting and suckling pups. Based on the results of the study we conclude that the local monk seal population of Gyaros is not composed of solitary individuals, as is generally thought to be the case throughout the distribution of the species in the eastern Mediterranean Sea, but that it has retained the social structure of a colony, similar to the one observed at the well-studied colony of the species at Cabo Blanco. This is only the first case of a monk seal colony in the eastern Mediterranean Sea and vividly exemplifies the importance of Greece in the conservation of the species. The information from this study has been used by the Hellenic Government in the establishment of a 3-mile no-fishing zone at the island of Gyaros. Within the framework of the EU LIFE+ NATURE “CYCLADES” project, MOM and WWF Greece have designed a scheme of concrete conservation and management actions in order to secure the preservation of the species at Gyaros.

### Bottlenose Dolphin (*Tursiops truncatus*) Habitat Use Within St. Catherines Sound, Georgia

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St. Catherines Sound, GA, is one of the last remaining relatively undeveloped areas on the United States East Coast. Because of the low levels of anthropogenic stressors, this study hopes to