the central eastern and southwestern areas of the polynya. Both of these areas are thought to have elevated levels of biologically productive due to mixing and upwelling. The highest density of seals was seen in the central eastern area of the polynya (2.76 seals/km^2 of ice). These observations suggest that ringed seal distribution in the North Water Polynya is neither random nor even, but likely determined by variations in biological productivity.

Aerial Hearing Sensitivity in Pinnipeds: A Comparison of Free-Field and Headphone Thresholds

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Several studies have investigated the aerial hearing sensitivity of pinnipeds using a variety of experimental procedures. It is difficult to make comparisons between studies because it is unclear how methodological differences may have affected measurements of hearing sensitivity. The recent acquisition of a hemi-anechoic test chamber allowed us to measure aerial hearing sensitivity in quiet, free-field conditions and make comparisons with results obtained with headphones for the same subjects (Kastak and Schusterman, 1998, JASA, 103). In this study, absolute aerial hearing thresholds were determined using a go/no-go testing procedure in both free-field and headphone listening conditions at 400 and 800 Hz for a harbor seal (*Phoca vitulina*). For audiometric testing using headphones, the subject wore supra-aural headphones secured in a neoprene harness. Signal levels were calibrated with a probe microphone at the entrance of the auditory canal. For free-field measurements, signal levels were calibrated at the position corresponding to the center of the subject's head, with the subject removed, using the same probe microphone. Auditory thresholds for both conditions were defined at the signal level corresponding to 50% correct detection. Results showed that the free-field thresholds were significantly lower than thresholds obtained with headphones by 33.3 dB at 400 Hz and by 12.3 dB at 800 Hz. Further investigations in air will reveal potential differences between free-field and headphone thresholds in a California sea lion (*Zalophus californianus*) and a northern elephant seal (*Mirounga angustirostris*). The direction of these differences between free-field and headphone thresholds are consistent with human data and are most likely attributed to experience, differences in calibration procedures, sound diffraction by the head and body, and masking effects of external and internal sources of ambient noise. We conclude that hearing sensitivity in marine mammals is likely under-estimated when headphones are used or when free-field conditions are noise limited.

Habitat Use by Harbor Seals at the Klamath River Mouth, California

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Pacific harbor seals (*Phoca vitulina richardsi*) are amphibious marine predators, spending time on land and in the water. Much of what we know about harbor seal ecology and habitat use is based on shore counts and remotely tracked seals at sea. This study is one of the first to comprehensively describe seal terrestrial and aquatic habitat use at a river mouth. My objective was to infer the role of harbor seals in their ecosystem by documenting seasonal changes in seal abundance and diet and determining if seals were concentrated in certain microhabitats. During weekly surveys I recorded seal abundance, distribution, and behavior on an hourly basis. Results are based on 90 survey days and 445 scat (June 1998 to August 1999). Up to 500 seals were present in the spring at protected haul-out sites and in the estuary, but much of the foraging took place at sea, as evidenced by habitat use patterns and the predominance of marine prey in the diet. A smaller but more constant number of seals, averaging 20, utilized the river mouth habitat and were concentrated along the edges and eddies. It is notable that the numbers of seals in terrestrial and aquatic habitats were not correlated. Seal diet was diverse, with a total of 38 species of marine and anadromous prey identified in scat, consuming mostly osmerids, pleuronectids, petromyzontids, and gadids. Salmonids occurred in 6% of scat in the summer and 16% in the fall. Time and tide had minor effects on seal abundance in some habitats, while human presence exerted a consistently negative effect on seal abundance in all habitats. Abundance, diet, and habitat use patterns suggest that harbor seals at the Klamath were not congregating at this river mouth primarily to take advantage of anadromous prey. The majority of seals utilized the river as a refuge for resting and breeding. A subset of the seal population foraged at the river mouth, utilizing edge microhabitats. These microhabitats may reach an effective carrying capacity at a much lower level than the terrestrial habitat, causing seal abundance to fluctuate independently on land and in the water.

Fine-Scale Foraging Behaviour of Antarctic Fur Seals: Prey Field Observations from a Digital Camera

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Diving behaviour of marine mammals is increasingly being studied, but identifying foraging among recorded dives often requires several assumptions. For example, energetic analyses of Antarctic fur seals (*Arctocephalus gazella*) assume that time spent at depth can be used as a proxy for foraging success. We test this assumption using a digital video camera linked to a time-depth recorder to record prey field images in conjunction with diving behaviour. During the austral summer 2000-2001, this system was deployed on six lactating female fur seals at Bird Island, South Georgia, each for a single foraging trip. The camera was triggered at depths over 10 m. Five deployments recorded still images (640 x 480 pixels) at 3-sec intervals (total 8288 images), the other recorded movie images at 0.2-sec intervals (total 7598 frames). Memory limitation (64MB) restricted sampling to the first 1.5 days of 5-7 day foraging trips. An average of 8.6% of still pictures (2.6 - 11.3%) showed krill (*Euphausia superba*) distinctly, while at least half the images in each deployment were empty. In one deployment, krill images were recorded within 2.5 hours (16 km, assuming 1.8 m/s travel speed) of leaving the beach. Five of the six deployments also showed other fur seals foraging in conjunction with the focal animal. Krill swarms were sometimes very dense (>3000/m^3). The distribution of depths of krill observations generally matched that of time spent at depth by the seal. At a finer scale, using krill presence as a measure of success, most isolated dives were unsuccessful, while the success of dive bouts was correlated with their number of dives. The presence of non-foraging dives suggests that time spent in bouts would be a more accurate proxy for foraging success than simply time spent at depth. This system will generate exciting new avenues for interpretation of diving behaviour.

Importance of Contextual Saliency on Vocal Imitation by Bottlenose Dolphins

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A previous experimental study (Reiss and McCowan 1993) on dolphin vocal learning documented the process and pattern of vocal imitation in bottlenose dolphins. This previous study demonstrated that dolphins spontaneously imitate novel signals when paired with salient environmental events. The acquisition process of the dolphins' imitations paralleled both the avian and human vocal development literature. Yet this past study did not directly test whether specific contingencies were necessary for vocal imitation by dolphins. The purpose of the present study was to investigate the effects of contextual saliency on vocal imitation and acquisition in bottlenose dolphins. Over a six-month study period we experimentally exposed two infant male bottlenose dolphins and their mothers to six novel computer-generated whistles that were either unpaired or paired with specific contextual events (preferred toy objects). The results demonstrate that acoustic exposure alone was sufficient for spontaneous vocal imitation to occur but that the context affects the timing, extent and quality of vocal imitation by bottlenose dolphins. Imitations of computer signals paired with preferred toys occurred earlier (required fewer exposures), were generally