

Experimental assessments of auditory masking for a California sea lion and two Pacific walruses

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The conservation status of walruses (*Odobenus rosmarus*) is influenced by rapid warming of Arctic ecosystems and associated pressures related to anthropogenic disturbance. As the only living species within the isolated odobenid lineage, walruses have no close relatives from which auditory information can be extrapolated. Instead, walruses are typically grouped with otariid carnivores (sea lions and fur seals) in terms of noise exposure criteria. To advance understanding of odobenid hearing in simultaneous noise, we compared behavioral measures of auditory masking for two Pacific walruses and one representative otariid, the California sea lion (*Zalophus californianus*). Detection thresholds were measured outdoors in air at frequencies between 0.2 and 16 or 32 kHz, respectively, in ambient noise conditions and in the presence of octave-band white masking noise. Ambient thresholds were as low as 30 dB re 20 μ Pa for the walruses—more than 20 dB higher than for the sea lion. Critical ratios for the sea lion ranged from 16 dB at 0.2 kHz to 35 dB at 32 kHz and showed a predictable monotonic increase of about 3 dB per octave with increasing frequency. Preliminary data collection with the walruses shows critical ratios from 20 dB at 0.2 kHz to 32 dB at 10 kHz, generally similar to those obtained for the sea lion. Data available thus far suggest that, despite key differences in terrestrial hearing abilities and more than 18 million years of evolutionary separation, odobenid and otariid carnivores can be reasonably grouped with respect to their hearing in noisy conditions.

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