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Investigating noise effects on the call amplitude of endangered
Southern Resident killer whales (*Orcinus orca*)

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Anthropogenic sound exposure has been identified as a potential threat to endangered Southern Resident killer whales (SRKWs). Such exposure can mask important biological sounds including those used for social functions. Vocal animals might compensate for increased background noise by calling louder (the Lombard effect). In this study, amplitude compensation was investigated in SRKW communication calls recorded off of San Juan Island, WA, U.S.A. Data were obtained from two calibrated recording systems, a shore-based hydrophone array [V. Veirs, *J. Acoust. Soc. Am.*, **116**, 2615 (2004)] and a boat-based vertical array. Calls were localized using time of arrival differences to estimate range and apparent source levels after background levels were subtracted from the signal. Call levels were calculated assuming spreading loss functions determined from sound propagation observations made in situ. Results demonstrated a positive relationship between call levels and background levels. Costs of such vocal flexibility are unknown, but may include changes in energetic demand and/or communicative functionality. Within the data ranges measured in this study, killer whales communicatively adjusted for fluctuating background noise levels. However, other sounds detected during passive listening (e.g. prey sounds) might be more susceptible to masking effects [Work supported by NOAA and Colorado College].