

## **Diel variation in beaked whale diving behavior: Physiological limitation or predation avoidance?**

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Beaked whales are possibly more susceptible to impacts from mid-frequency sonars than any other cetaceans. Several aspects of their diving behavior have been suggested as potentially related to such susceptibility. Cuvier's and Blainville's beaked whales are among the longest/deepest diving cetaceans. Deep foraging dives, often exceeding an hour in duration, have substantially slower ascents than descents, and have been reported to be followed by an extended period of progressively shallower "bounce" dives. It has been questioned whether these "bounce" dives may serve as recompression dives to reduce the likelihood of gas embolisms. We hypothesize that if such dives and the slow ascent rates serve a physiological function, they should occur following long deep dives throughout the day and night. We examine diel patterns of behavior in six Blainville's (126 hours day; 129 hours night) and two Cuvier's (19 hours day; 15 hours night) beaked whales using time-depth recorders. For Blainville's beaked whales, deep (>800 m) dive rates were similar between the day (mean=0.38 dives/hour, SD=0.09) and night (mean=0.46 dives/hour, SD=0.09), and there were no significant differences in depths, durations, ascent rates or descent rates for deep dives between the day and night. Shallow (100-600 m) dives occurred significantly more often during the day (mean=1.59/hour, SD=0.54) than at night (mean=0.26/hour, SD=0.20). Series of progressively shallower "bounce" dives were only documented to follow the deep, long dives made during the day; at night whales spent more time in shallow (<100 m) depths. Similar patterns were found for the Cuvier's beaked whales. Our results suggest that such "bounce" dives do not serve a physiological function, although the slow ascents may. This diel difference in behavior suggests that beaked whales may spend more time away from surface waters during the day to avoid near-surface, visually oriented predators such as tiger sharks or killer whales.