

Group structure and mating strategies of Cuvier's (*Ziphius cavirostris*) and Blainville's (*Mesoplodon densirostris*) beaked whales off the island of Hawai'i

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Why is this interesting?

- Small, long-term resident populations of Cuvier's and Blainville's beaked whales exist off Hawai'i Island
- Little is known about their mating systems or group structure worldwide

What we did:

- We used photo ID to examine group structure & sighting histories of adult Cuvier's & Blainville's beaked whales off Hawai'i Island
- We estimated age class & determined sex using sighting history, markings, morphology (presence of erupted teeth in males) and calf presence
- We examined group composition for age & sex-related differences among individuals & between species

What we found: site fidelity differs between sexes

- Adult females of both species were encountered significantly more frequently than adult males and showed more long-term site fidelity
- Adult sex ratios were not significantly different from 50:50 for either species, but adult female Blainville's were re-sighted significantly more frequently than males
- Sample sizes were similar for both species, however Blainville's were typically found in larger groups:

	Blainville's	Cuvier's
# Times seen	97	89
Span of years	29	25
Mean group size	3.2	2.0
Group size range	1-10	1-5



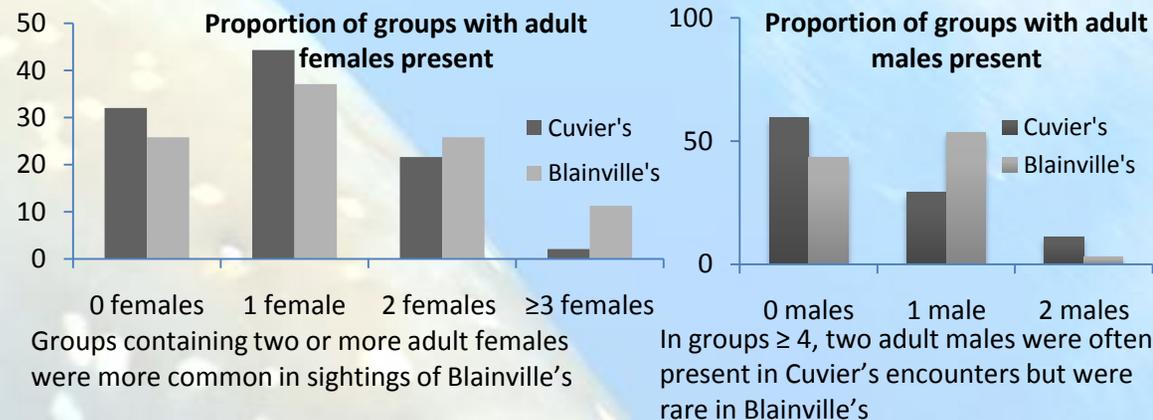
Erupted teeth (seen above covered in stalked barnacles) are diagnostic of adult males for both species

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What we found: group size & composition differs between species

- Blainville's often traveled in larger groups composed of multiple females and rarely with more than one adult male, while Cuvier's traveled in smaller groups often with multiple adult males
- Males present in the same encounter for either species typically avoided each other & one male generally had more prominent teeth & scarring



Differences in group size & composition reflect different mating strategies

- Our study supports female defense polygyny as a potential mating strategy for Blainville's in Hawai'i .
- However, unlike studies elsewhere, multiple adult males in Hawai'i were occasionally seen in the same group, suggesting some geographic variation exists
- Our observations of Cuvier's traveling in multi-male groups when females are present support emerging evidence that sperm competition may play an important role.
- However, the presence of erupted teeth in males and extensive scarring from agonistic encounters is contrary to other species demonstrating sperm competition, suggesting Cuvier's may employ a uniquely modified system

References

- MacLeod, C. D. 2010. The relationship between body mass and relative investment in testes mass in cetaceans: Implications for inferring interspecific variations in the extent of sperm competition. *Marine Mammal Science*, 26: 370–380.
- McSweeney, D.J., R.W. Baird and S.D. Mahaffy. 2007. Site fidelity, associations and movements of Cuvier's (*Ziphius cavirostris*) and Blainville's (*Mesoplodon densirostris*) beaked whales off the island of Hawai'i. *Marine Mammal Science* 23:666-687.

For more information see www.cascadiaresearch.org/hawaii.htm