Case study 2- Pacific Region: Distribution and demographics of Cuvier's beaked whales in Southern California Bight

Provider: Marine Ecology and Telemetry

Contact: Gregory Schorr

Region: SOCAL, SOAR

Priority species: Cuvier’s beaked whale, Baird’s beaked whale (limited) Humpback whale (limited)

Project years: 2010 - Ongoing (with data on priority species)

Grade: A1

Grade definition

Detailed presentation of data streams that demonstrate the data from this project could provide one or more metric of early warning signs under MSM4PCoD.

Project Summary

The goal of this study is to examine Cuvier's beaked whale habitat use and demographics utilizing various methods including satellite tagging, photo-id, and biopsy. In the beginning surveys funded by the U.S Navy around soar were designed to provide visual verification of acoustic mammal detections on the SOAR hydrophone array, later photo-id was implemented to understand the population structure of Cuvier’s beaked whale and fin whale, followed by the objective to tag individuals to understand the impacts of MFAS.

Relevance to MSM4PCoD

* The data collected under this project have already been implemented in a publication on the abundance of Cuvier’s beaked whale in the SOCAL region, using Capture-Recapture data (Curtis et al. 2020).
* Curtis et al 2020 also incorporated some information on sex and age in their analysis, and while this wasn’t used to improve the precision of estimates, the availability of this information is promising for use in an integrated population model.
* Knowing that we could access abundance estimates for this population of Cuvier’s beaked whale, and that the SOAR region is relatively well studied, this project is suggested to be key for the power analysis and integrated population models under the MSM4PCoD project.

Data availability/Sample sizes

**Visual (boat-based):** Data spanning from 2010 – 2020 is available through the navy website, 1,767.7 hours of survey effort over 24,677.1 km were reported. There is no information on detection probability and data is not available on Obis Seamap.

**Capture-Recapture**: Photo-ID data in the SOCAL region has been reported between 2006-2020, with some information available on catalog size and unique Individuals per survey period. The majority of this data is from Cuvier’s beaked whale, with only two years of data on humpback whale. The supplemental report from the Curtis et al 2020 report includes the image quality, and distinctiveness for each sighting of Cuvier’s beaked whale, as well as an estimate of sex and age.

**Telemetry:** Under this project, location and location/depth tags have been deployed since 2008, primarily on Cuvier’s beaked whale (n=31), but also on Baird’s beaked whale (n=2).

**Remote Tissue Sampling:** Biopsy samples for priority species are limited to Cuvier’s beaked whale (n=20), with samples collected between 2011-2018, analysis of sex has been included in only a few reports, however Curtis et al. (2020) used biopsy data in conjunction with photo-id to sex individuals.

Questions for data holders

* Is there complementary PAM data available from the M3R project?
* Was g(0) assumed to be equal to 1 during the visual boat-based surveys?
* Is there a database available of the analysed biopsy data? What information was extracted?
* How much effort (i.e invested hours) was required to process the capture-recapture data?

References

Curtis, K. A., E. A. Falcone, G. S. Schorr, J. E. Moore, D. J. Moretti, J. Barlow, and E. Keene. 2020. Abundance, survival, and annual rate of change of Cuvier's beaked whales (Ziphius cavirostris) on a Navy sonar range. Marine Mammal Science.