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Dear Editors-In-Chief,

We are pleased to submit our manuscript for our research article titled “Inferring sperm whale (*Physeter macrocephalus*) sex and developmental stage using aerial photogrammetry” by Ana Eguiguren (corresponding author), David Gaspard, Christine M.K. Clarke, and Hal Whitehead for consideration in Scientific Reports.

Uncrewed aerial vehicles (UAVs) have been adopted in the last decade by field researchers across taxa by offering a privileged vantage point for observing animal behaviour and obtaining morphological measurements with minimal disturbance. This technology has been particularly valuable for studying cetaceans in the wild, whose typically large body sizes and sub-aquatic lives make direct measurements and close inspections challenging. The field of UAV-based photogrammetry has progressed rapidly, enabling researchers to obtain reliable measurements of total body length [1], body condition [2], and reproductive status [3], which provide essential information for our understanding of individual and population-level health, demographic structure, and reproductive potential.

In our manuscript, we developed a novel methodology for inferring the sex and developmental stage of sperm whales (*Physeter macrocephalus*)using UAV-based photogrammetry. Our approach integrates historical whaling data on the growth and sexual dimorphism of sperm whales with Bayesian theory to compute the posterior probability that individuals belong to either sex. Our method provides an effective and low-cost means of obtaining valuable information to understand sperm whales’ complex behavioural development and evaluate their demographic structure. We believe our paper will be of broad interest to your readership, as it provides a novel but easily accessible application of UAV-photogrammetry. Moreover, it can be easily adapted to other sexually dimorphic species where field-based age-class and sex determination is challenging.

We confirm that this work is original and has not been published elsewhere, except as a preprint in BioRxiv (<https://doi.org/10.1101/2025.10.17.683129>), nor is it currently under consideration for publication elsewhere.

We have identified the following possible suitable reviewers for our work based on their expertise in the field of UAV-photogrammetry applied to cetaceans:

* Dr. Frederik Christiansen, Aarhus University, [f.christiansen@ecos.au.dk](mailto:f.christiansen@ecos.au.dk)
* Dr. Fabien Vivier, University of Hawaii, [fvivier@hawaii.edu](mailto:fvivier@hawaii.edu)
* Dr. Chloe Robinson, Ocean Wise Conservation Association, [Chloe.Robinson@ocean.org](mailto:Chloe.Robinson@ocean.org)

We have not identified referees that we would like excluded from reviewing.

Sincerely,

Ana Eguiguren (she/her)

Corresponding Author

Ph.D. Student

**References**

1. Burnett JD, Lemos L, Barlow D, Wing MG, Chandler T, Torres LG. 2019 Estimating morphometric attributes of baleen whales with photogrammetry from small UASs: A case study with blue and gray whales. *Mar. Mammal Sci.* **35**, 108–139. (doi:10.1111/mms.12527)

2. Christiansen F *et al.* 2020 Population comparison of right whale body condition reveals poor state of the North Atlantic right whale. *Mar. Ecol. Prog. Ser.* **640**, 1–16. (doi:10.3354/meps13299)

3. Robinson CV, Visona-Kelly BC. 2025 A geometric morphometric approach for detecting different reproductive stages of a free-ranging killer whale *Orcinus orca* population. *Sci. Rep.* **15**. (doi:10.1038/s41598-025-86793-3)