SCIENCES & BIOENGINEERING SCIENCES

The Research Group

Ecology, evolution & genetics

has the honor to invite you to the public defense of the PhD thesis of

Joëlle De Weerdt

to obtain the degree of Doctor of Sciences

Title of the PhD thesis:

Ecology of humpback whales (*Megaptera novaeangliae*) off the Pacific coast of Nicaragua

Promotors:
Prof. dr. Marc Kochzius (VUB)
Prof. dr. Tom Van der Stocken (VUB)
Dr. Phillip Clapham (Seastar Scientific Inc, USA)

The defense will take place on **Friday, October 4, 2024 at 5 p.m. in auditorium I.2.01**

The defense can also be followed through a live stream on
https://bit.ly/PhD_DeWeerdt

Members of the jury

Prof. dr. Iris Stiers (VUB, chair)
Prof. dr. Thomas Merckx (VUB, secretary)
Prof. dr. Kim Roelants (VUB)
Prof. dr. Krishan Das (ULiège)
Prof. dr. Steven Degraer (KBIN)

Curriculum vitae

Joëlle De Weerdt obtained her MSc degree in Biology from the Vrije Universiteit Brussel in 2010. In 2016 she initiated a cetacean conservation project in Nicaragua with her non-profit organization Association ELI-S, and in 2019 began her PhD in the Biology Department at the Vrije Universiteit Brussel. During her PhD, she focused on the population biology and dynamics of humpback whales, with a primary research interest in conservation biology and associated management. Over the course of her PhD, she co-authored 15 peer-reviewed papers and presented 17 oral presentations and posters at 8 international conferences.

Abstract of the PhD research

Understanding population dynamics, habitat use patterns, social behaviour and migratory patterns are key to establishing conservation measures for humpback whales, *Megaptera novaeangliae*, especially for endangered populations such as the Central American Population (CAM) where data are limited and dedicated research is urgently needed. Our study combined citizen science and science-based datasets collected at two coastal sites in northern and southern Nicaragua over multiple breeding seasons from 2004 to 2023. We investigated whether Nicaragua is a breeding area for humpback whales, and if differences in habitat use patterns were identified between northern and southern Nicaragua according to the social groups. The number of individuals that visit Nicaragua were calculated and the presence of spatial structuring was inferred through photographic recaptures between both sites. We further investigated migratory routes and connections by comparing photo-identification data from Nicaragua with the international database Happywhale. A temporal analysis of the recaptures was performed to understand the migratory timing of the animals. We investigated the migratory connection of a different Southern Hemisphere population that was observed by citizen scientists during the wet season (July – October), the Breeding Stock G (BSG). Since different environmental conditions are occurring between the dry and the wet season due to the occurrence of the Costa Rica thermal Dome (CRD) upwelling system in coastal waters, we further investigated how this was influencing abundance and behaviours of the two humpback whale populations. Environmental parameters related to marine productivity included sea surface temperature, chlorophyll-*a* and time-lagged chlorophyll-*a*. This study provided a better knowledge of population dynamics, migratory behaviours, and habitat use patterns and behaviours in relation to dynamic environmental conditions. This knowledge serves as a basis for conservation measures, such as managing whale watching activities, mitigating anthropogenic threats, and planning the future development of Marine Protected Areas.