Post doctorate fellowship to "develop a regional assessment of cetacean abundance and distribution in the Bay of Biscay and Iberian Coast"

Observatoire Pelagis

Observatoire Pelagis (UMS 3462 CNRS – La Rochelle University) is a joint CNRS and La Rochelle University unit[1]. It focuses on the conservation of marine megafauna, including seabirds and marine mammals. It coordinates the National Stranding Network on marine mammal strandings throughout France and French oversea territories; provides expertise on marine mammal conservation to the French Ministry in charge of ecology; design at-survey aerial surveys to collect *in situ* data on marine megafauna; curate, store and make data available to stakeholders and researchers; and carries out research on marine megafauna. The team includes approx.. 20 vibrant and dedicated staff[2].

Observatoire Pelagis is a partner of the CetAMBICion project on 'Coordinated Cetacean Assessment, Monitoring and Management Strategy in the Bay of Biscay and Iberian Coast sub-region'[3]. General objectives of CetAMBICion are to provide and coordinate the necessary scientific expertise and institutional capacity to (i) deal with the issue of non-intentional fishery bycatch of cetaceans and (ii) support the regular assessment of cetacean populations and habitat use, and thus take a decisive step forward towards the achievement of Good Environmental Status (GES *sensu* the Marine Strategy Framework Directive MSFD) in the Bay of Biscay and Iberian Coast sub-region.

Context

The post doctorate will be working on the "Proposal of coordinated subregional assessment, GES determination and monitoring strategy for cetaceans", and more specifically on the task of "Data gathering and joint analysis and identification of data gaps".

The MSFD requires the implementation of monitoring programmes to evaluate and assess the performance of the management measures implemented to achieve GES. Monitoring schemes must ensure that the geographic and temporal coverage of marine mammal populations are sufficient and constant over time and should be cost-effective. Moreover, this trade-off between spatial and temporal coverage should ensure that the effects of spatio-temporal variability on the measured indicators of GES are captured in order to be able to detect changes and identify factors leading to these changes.

Nowadays, many annual at-sea surveys, which formerly focused on estimating fish abundance and/or studying oceanography, have become integrated ecosystem surveys which act as data integration systems by providing the synoptic collection of data on different oceanographic and biological components. Monitoring of marine mammal abundance and distribution requires dedicated surveys over large areas; however, due to the logistics and costs involved, these large scale, dedicated surveys are not taking place annually, leading to few studies which can determine the consistency of spatial abundance, distribution range and habitat relationships over time. The information provided by annual surveys is essential to address

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habitat preferences over time and can complement the less frequent (e.g. decadal) European level dedicated at-sea surveys (SCANS surveys).

Data collected on surveys regularly taking place in the MSFD sub-region Bay of Biscay and Iberian Coast will be collated and, when possible, analysed jointly using state-of-the-art statistical methods such as Density Surface Models[4]. Boat survey data are routinely collected each year following a standard and shared protocol between Member States (MS), which guarantees the interoperability and comparability of these data. A common methodology across MS for the data analysis at a scale commensurate with the MSFD subregion will be sought. Outputs will include writing R[5] scripts to automate data analysis and the seamless production and updating of D1C2 (abundance), D1C4 (distribution), and possibly D1C5 (habitat) with data collected annually in the Bay of Biscay and Iberian Coasts.

Job description

In this context, the candidate will develop and streamline a methodological framework aiming at computing regional indicators of GES for cetaceans in the Bay of Biscay and Iberian Coast sub-region. The post-doctoral missions are to:

- Develop statistical modeling tools to estimate abundance and distribution of cetacean species using state-of-the-art modeling methods;

- Develop an ensemble of reproductible analyses and write re-usable codes in the form of an R package (R Core Team 2021);

- Liaise with other partners (by email, remote visio etc.) to report modelling updates and progress (and setbacks) to make sure that objectives are met by the end of the project; and

- Produce a recommendation report and a scientific paper based on the modelling work achieved.

To achieve these goals, the candidate will work with data collected onboard oceanographic surveys carried out by France, Spain and Portugal, as well as other ship and aerial surveys, both international (CODA, SCANS) and national (SAMM). These data are already collected and formatted so that data analysis can start at the time of recruitment of the candidate. The candidate will develop codes written in the R language, and ideally bundle them into a R package for reproducibility and ease of re-use. This R-package will be made available to all partners at the end of the CetAMBICion project.

The post-doctorate will be supervised by Dr. Matthieu Authier[6] and punctually by other researchers involved in the CetAMBICion project. Dr. Authier is an expert in statistical modelling of biodiversity data, notably of marine mammals and seabirds. The Pelagis Observatory is dedicated to the acquisition of biodiversity data on marine megafauna in all French waters (including oversea France). Being recruited by La Rochelle University, the post doctorate will benefit from the environment provided there, and will be in touch with a lively team of diverse staff all dedicated to the conservation of marine megafauna. La Rochelle is a lively and

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[4] Miller, D.; Burt, M.; Rexstad, E. & Thomas, L. (2013) Spatial Models for Distance Sampling Data: Recent Developments and Future Directions. Methods in Ecology and Evolution, 4, 1001-1010

[5] R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org/

[6] https://www.observatoire-pelagis.cnrs.fr/pelagis/the-team/matthieu-authier/?lang=en

agreeable city situated on the Atlantic seaboard of France[7]. It has an airport[8] and a fast train station (2h00 away from Paris by TGV, 1h30 away from Bordeaux or Nantes by regional trains or car).

Profile and skills

Initial training
PhD in ecology, environmental sciences or statistical ecology.

Specific knowledge and experiences
Required:
- Strong experience in spatial analyses and statistical modelling of transect-based surveys (distance sampling, generalized additive modelling[9], density surface modelling).
- Good programming skills for data analyses (notably R)
- Good knowledge on the different methods used to monitor the marine megafauna and their limitations (inferences which can be made, analytical methodologies, fieldwork constraints).
- Good English oral and writing skills (scientific publications, reports, workshops and conferences).

Desirable:
- Broad knowledge on cetacean species in the Bay of Biscay and Iberian Coasts subregion.
- Knowledge of environmental policies and conservation issues in the context of the European Marine Directive Strategy Framework.
- Knowledge on marine ecosystem functioning and especially on marine mammals and seabirds.
- Knowledge on reproducible workflows and the creation of R packages

Professional Qualities
- Scientific rigor.
- Spirit of initiative and multidisciplinary openness.
- Taste for applied research.
- Ease of expression, argumentation and communication in a partnership context.
- Taste for teamwork but ability to work autonomously as well.

Practical information
- **Type of contract:** temporary CDD "Contrat à Durée Déterminée »
- **Duration of the contract:** 12 months
- **Status:** Post-doctoral fellow
- **Workplace:** The successful candidate will be, sanitary conditions permitting, hosted at La Rochelle University. They will also take part in CetAMBICion workshops and meetings, physically if sanitary conditions are adequate.
- **Starting date:** 02/11/2021
- **Deadline for application:** 30/09/2021

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[7] https://www.larochelle.fr/
[8] https://www.larochelle.aeroport.fr/en/
[9] Pedersen, E. J.; Miller, D. L.; Simpson, G. V. & Ross, N. (2019) Hierarchical Generalized Additive Models in Ecology: an Introduction with mgcv. PeerJ, 7, e6876

La Rochelle University is an equal opportunity employer that is committed to diversity and inclusion in the workplace[10].

How to apply
- Applications must consist of a **CV** (max. 2 pages) and a **cover letter** (max 2 pages).
- To apply, please send an email to mauthier@univ-lr.fr with 'CetAMBICion WP2 post-doctorate application' in the heading. For further information, contact same.
- Interviews will be carried out in early October.