PhD Position at Doñana Biological Station – CSIC

"Implementation of a participatory and dynamic social-ecological systems approach to the monitoring of the Doñana region"

Application: September-November 2025

Start: early 2026

Funding: PIX2025 Predoctoral Fellowship (Spanish Ministry of Science)

Duration: 4 years

Summary of the PhD project

The **social-ecological system (SES) approach** emerged from the need to explore the interactions between human systems and ecosystems from a holistic perspective. SES are defined as complex **integrated systems of humans in nature**, resulting from a co-evolutionary process, which are dynamic, non-linear, hierarchically structured, self-organizing and adaptive. Most problems associated with **global change** are also characterized by complex dynamics and interactions, the study of which poses a **challenge** for **traditional scientific approaches**. Therefore, the SES approach is **crucial for addressing global change challenges** to lead to better ecosystem health and human quality of life. Within SES research, **participation** can help create in-depth common understanding of positive and negative feedbacks between elements of the system, and foster collective action to restore it. Involving stakeholders in **participatory SES modeling** in particular, has proven to support comprehensive understanding of systems functioning and its social-ecological resilience, identifying the causes of system behavior and helping decision-makers envision the potential consequences of their actions. The **Doñana** area in particular is an outstanding example of a critically **threatened natural area**, where the highest international **protection** standards coexist with severe **anthropic drivers of unsustainability** such as intensive agriculture and mass tourism. However, in Doñana, and particularly at EBD-CSIC, the main historical focus has been on **biophysical** research.

In this context, the **overarching objective** of the PhD will be **to implement a dynamic social-ecological systems approach**, based on **participatory** and **trans-disciplinary** tools, that can

support decision making towards the **adaptive transformation of Doñana** as a European benchmark for environmental **sustainability**, social **equity** and **resilience** to global change.
In particular, the following **specific objectives** are proposed:

O1) to identify, with the support of an interdisciplinary team of experts, the most relevant **socio-economic, cultural and governance data sources and data bases** related to human-nature interactions and socio-environmental conflicts in the area of influence of Doñana, as well as the values they relate to;

O2) to **systematize and incorporate** the data scoped in O1 into the **Doñana ICTS** architecture;

O3) to design a **participatory system dynamic model of Doñana SES** where the interactions between biophysical, cultural, socio-economic and governance variables are depicted; and

O4) to set up a virtual public **decision support system**, based on the model in O3 and populated with ICTS data (including that scoped in O1-O2), which can contribute to monitoring the social-ecological impacts of different policy solutions.

Candidate's profile

- Master (completed or near completion) in environmental sciences, ecological economics, political ecology, environmental anthropology, or similar inter- or trans-disciplinary approaches.
- Proven interest and experience in inter- or trans-disciplinary settings between the social and natural sciences, mixed-methods approaches (quali- and quantitative) and social participation techniques.
- Previous experience and/or training in system modeling and in group facilitation will be highly valued.
- Good command of Spanish and English.
- We are keen to support diversity and equity in academia, so candidates contributing to it will be very welcome.

Advisors profiles

- **Elisa Oteros Rozas** studies socio-ecological systems and their challenges by applying or developing theoretical tools from conservation biology, geography, rural sociology, ecological economics, political ecology, and environmental anthropology in interdisciplinary and transdisciplinary teams and projects. Her main lines of research are: 1) the study of agri-food systems as socio-ecological systems, including the socio-cultural assessment of ecosystem services and biodiversity in agroecosystems, from the

perspective of agroecology; 2) pastoralism and extensive livestock systems; 3) the political ecology of wildlife conservation and protected areas, including conflicts of land use and values; and 4) socio-ecological resilience and adaptation to global change. Participatory and gender approaches are usually transversal in her work. Initially trained in Biology, she holds a Master's Degree in Ecology and a PhD in Ecology and has training and extensive experience in social research methods, quantitative and qualitative data analysis such as meta-analysis, social network analysis, interviews and group facilitation.

- **Jennifer Leonard** focuses her research on understanding how environmental changes affect genetic diversity in natural populations, exploring both the generation of biodiversity through divergence and speciation, and its loss through population decline and extinction. Her work primarily centers on small mammals and carnivores of Southeast Asia (Sundaland) and the Holarctic Quaternary, combining genetic data with ecological, morphological, and isotopic analyses to address fundamental questions in evolution and conservation biology.

What is offered

- A 4-year fully funded PhD contract.
- A vibrant, innovative and friendly working environment at Doñana Biological Station in Seville (Spain).
- Access to inter- and trans-disciplinary national and international research networks, including participation at conferences and at least one research stay abroad.
- Support of several aligned research projects.

How to proceed if interested

We are identifying potential candidates ahead of the official call, expected in September-October 2025. If interested, please send an email as soon as possible to elisa.oteros@ebd.csic.es and jleonard@ebd.csic.es (subject “PhD Application PIX2025”) including your CV, a motivation letter and the contacts of one or two researchers with whom you have collaborated, as references.