RESEARCH LINE AND TRAINING PROGRAM

The research will be developed in the framework of project **Increasing the resilience of High Nature Value pastoral systems hosting wild and domestic ungulates (**RESILGRAZE), aimed at developing evidence-based, adaptive management strategies that optimize the balance between pastoral livestock farming, wildlife conservation, ecosystem services, and ecosystem resilience in Europe's (Mediterranean- and temperate-climate) Atlantic ecosystems facing climate change. The project will obtain and analyze field, remote-sensing and animal movement data, with the aim of fostering the development of adaptive co-management programs focusing on the design, implement and monitoring management interventions, in four iconic Natural Protected Areas within that region: Doñana National Park (DNP), Serra de Xistral (SX), Lauwersmeer (LW) and Cairngorms (CG). Key ecosystem services targeted by the interventions include carbon storage, soil fertility, pasture production, water provision, prevention of forest fires – and, more generally, the conservation of biodiversity.

The grantee will participate in the design, execution and analyses of field and remote-sensing surveys at the different sites (with a larger effort devoted to the two Spanish sites, DNP and SX), including (i) vegetation composition, plant production and consumption, and C and N stocks; (ii) animal behaviour, movement and space use the analysis of images obtained with camera-traps and drones, combined with movement data obtained with GPS collars; and (iii) food selection, digestion efficiency and body condition by ungulates, using biochemical (cortisol) and barcoding analyses of faecal samples. Emphasis on these different aspects will be decided while designing the work-plan, in the first trimester of the work period.

The PhD student will be co-supervised by the two senior researchers of the research team, Luis Santamaría and Jaime Fagúndez. He will also receive the support of the two senior members of the research team (Silvia Pérez-Espona and Chris Smit), which will offer their centers and research facilities be visited during two of the three research stays abroad planned. In principle, he/she will enroll in the PhD programs available at Universidad Palo de Olavide in Sevilla (Programa de Doctorado en Medio Ambiente y Sociedad), where LS has been a lecturer for the last six years. The program includes a broad spectrum of training activities that, in addition to more traditional program of lectures, includes annual PhD-student symposia, seminars, alumni meetings and business-orientation events. It also offers annually mobility grants, complementary those offered by this funding agency, which will be sought for the development of international stages and training actions.

Following the requirements of mobility of the PhD program, the PhD student will be expected to attend a minimum of two top-quality international courses, such as those addressing animal movement ecology (such as Marx Plank's AniMove and University of Amsterdam's Animal Movement Analysis**)**; and to make at least two international stages (e.g., at the aforementioned research centers of the two other senior researchers of the project). The PhD student will also benefit by the numerous support activities offered by EBD-CSIC, which include weekly seminars by first-line international researchers; the opportunity to receive annual supervision by a (international) steering committee; access to EBD's and CSIC's training activities, including the annual course in animal welfare for research; and several courses of high relevance for his/her research topic (e.g. remote sensing, GIS, UAVs, experimental design, statistical analyses, modelling).

TRAINING CAPACITY OF THE SUPERVISORS AND RESEARCH TEAM

The research project that the PhD student will develop will be related to a broader assessment of the long-term effects of climate change on plant-herbivore dynamics and ecosystem function (e.g., carbon and nutrient dynamics) at multiple-spatial scales, ranging from the individual to the landscape level and including the interplay between aquatic and terrestrial ecosystems. The project activities and results will represent a suitable departure point from which the PhD student will be able to add in-depth studies of the effects of ungulates on other elements of the (aquatic and terrestrial) ecosystems placed along the project's broad latitudinal gradient, and the impact of climate change thereupon. The student will surely benefit from the scientific excellence, interdisciplinarity and internationality of the research and working teams in developing such topics, which are in the cutting edge of current research in ecology, biological conservation and climate change. Furthermore, the two co-supervisors proposed of the research team have no current compromises to supervise other PhD students; hence, they will avail of sufficient time to provide an adequate supervision to the one requested here.

Theses completed or in progress within the scope of the research team (last 10 years).

The senior members of the research team have formed, independently, a high number of researchers who successfully defended their PhD or MSc theses. All PhD these mentioned below have obtained outstanding marks and resulted in high quality scientific papers. Luis Santamaría has supervised and 13 MSc theses and 8 PhD theses. Jaime Fagúndez has supervised 1 PhD thesis and 6 MSc theses. Since 2018, he is the Coordinator of the UC's Master in Terrestrial Biodiversity. The two senior researchers of the work team are also committed to participate actively in the supervision of the PhD: Chris Smit has supervised 7 PhD theses and is currently supervising 5 more, whose defense is planned before the end of the year. He has also supervised 48 MSc theses, 38 of them in the last 10 years. Silvia Pérez Espona is the coordinator of the MSc program in Applied Conservation Genetics with Wildlife Forensics at the University of Edinburgh. She has supervised 31 MSc theses and is currently supervising 2 PhD students.

CV OF SUPERVISORS

Luis Santamaría: https://spatialecologygroup.blogspot.com/p/cva-luis-santamaria_16.html

Jaime Fagúndez: https://pdi.udc.es/es/File/Pdi/QV8CK