ECOSYSTEMIC IMPACT OF WILD BOAR BY OCCUPANCY MODELING AND APPLICATION OF A NOVEL TRAP SYSTEM: EFFICIENCY AND EFFECTS ON ANIMAL WELFARE.

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Wild boar can be considered one of the most problematic wildlife species in the entire world today. The issues related to agricultural damages, loss of biodiversity, habitat degradation, disease (ASF), and human conflicts combined with the wide distribution around the globe put this animal in the spotlight in wildlife management.

This project aims to analyze the wild boar ecosystemic impact on the other species using Occupancy modeling and find the best removal tool to manage this issue by evaluating a novel trap system.

The study will take place in the Presidential Estate of Castelporziano (RM), a 6000 ha fenced area characterized by a high variety of different habitats and biodiversity.

Since 2017 in the Estate a camera trap standardized survey has taken place twice a year. The sampling design consists of 80 camera traps distributed along an 800 m square grid that recording for 15 days. Then, every year since 2001, a Line Transect Distance Sampling (LTDS) survey has been carried out to obtain a wild boar (and other ungulates) density estimate.

In the first year of the PhD project, the goal is to set a Density Surface Model, using LTDS dataset, to obtain a local wild boar distribution. In the second year, this distribution will be used as a covariate in the occupancy model of the other target species to see the effect of wild boar on their distribution. During the third year, a multi-species occupancy model will be carried out to evaluate the complex interactions between the analyzed species.

The knowledge acquired through ecological studies can highlight the impact of wild boar on other species. But, after that, finding the best possible tool for managing the removal actions in controlling wild boar densities is essential. In this scenario will take place a novel trap system evaluation: the "Pig Brig Trap System".

The system consists of a circular net that, using a process conceptually similar to that used in fish nets, allows animals to enter but not to exit.

Using the marked-animal sample present in the Estate (collected during an annual capture-mark-recapture activity since 1996), the study aims to evaluate this trap in comparison with the traditional animal-activated traps already present in the area.

The evaluation will focus on:

- animal welfare: analyzing the effects of trapping events in the different trapping systems. A long-term stress evaluation will be carried out to analyze the mortality of animals captured in different traps through the years, while a short-term evaluation will consider the external damages and blood stress indicators.
- efficiency evaluation: focusing on trap avoidance probability (monitored using camera traps) and individual capture probability, estimated by observing the single marked-animal probability of being captured.