

VALONIA OAK (*QUERCUS ITHABURENSIS* SUBS. *MACROLEPIS*) IN GREECE: FROM MYTHOLOGY TO RESEARCH BREAKTHROUGHS FOR A SUSTAINABLE FUTURE

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PURPOSE AND SCOPE

Valonia (*Quercus ithaburensis* subs. *macrolepis*) is a high natural, economical, social, and culturally valued oak species that forms traditional agroforestry systems, mainly silvopastoral, in Greece (Pantera et al. 2018). Livestock has been grazing in the area since the time of Homer, the Roman and Byzantine periods, and continues to this day. The species since antiquity provided wood and acorns, tannins for tannery, and dye production extracted from the acorn cups, and was famous for religious reasons. Through time, these systems' value switched to other uses with more economic value but nowadays it is confined to firewood production and for grazing livestock. Natural regeneration in these systems is affected (besides grazing which is a major factor in limiting valonia oak natural regeneration) by a number of factors with climate change being an important one (Papadopoulos et al. 2017). The impact of climate change on valonia oak silvopastoral systems has not been thoroughly studied apart from one report on climate change that incorporates this species. Based on climate change scenarios, it is estimated that valonia oak is the third species that may face significant decrease to its populations area, scaling up to a loss of 56 percent (Bank of Greece 2011). Based on the same scenarios, in Greece and in the study area in particular, the expected temperature increase, and precipitation decrease, represents a crucial factor affecting the establishment of saplings and young seedlings or even the survival of young and older valonia oak trees. The major goal of the present work was to investigate grazing effects on valonia oak root growth parameters and wildlife species abundance.

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METHODS AND APPROACH

Permanent experimental plots have been established inside the forest since 2014 to evaluate several parameters including soil. The experimental area is located in the Xeromero valonia oak silvopastoral system in western Greece composed of open to relatively open stands with 25 to 50 trees/ha. Twelve rectangular plots covering an area of 40 m² were established and fenced against grazing from livestock and wild animals. In 2023, 12 rhizotrons were established to monitor root growth under different management (grazing). The rhizotrons were constructed by opening small pits of 70 cm by 50 cm by 50 cm size and consisted of four small glasses secured over the pit wall and one big glass (50 cm by 50 cm) against another pit wall. Two months after establishment, root growth was evident in the glasses. Additionally, wildlife cameras were established to monitor biodiversity based on tree density.

FINDINGS AND IMPLICATIONS

Roots were found in all rhizotrons. So far, the management applied does not seem to affect root growth, but more data is expected this year. Currently several vertebrates have been recorded with wild boars being the most abundant (fig. 1). It appears that the highest number of species is recorded in the highest density plots, which are the ones further away from human construction (houses).

There have been increased discussions lately on the preservation of such forests, not only for their valuable ecosystem services provision but also over the right of nature to be protected. Research, such as the study conducted under the framework of the eco2adapt project is valuable because it provides proof of the necessity to protect this forest as a biodiversity hotspot. It also provides measurable data and input to support policy regulations that favor nature preservation and restoration.

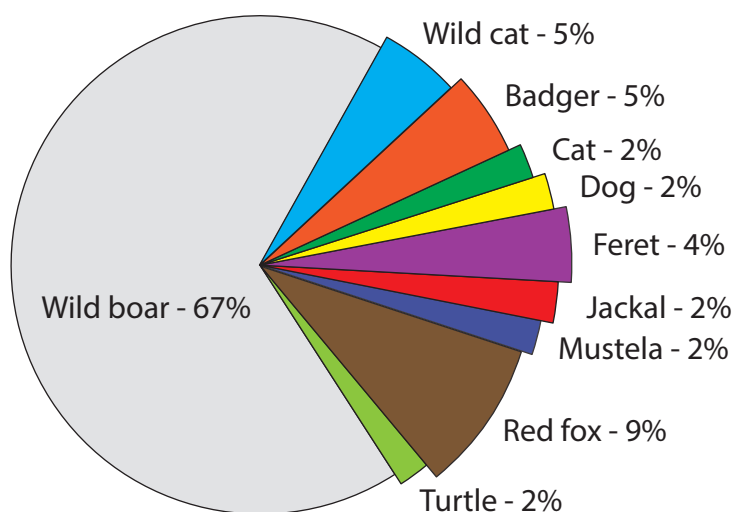


Figure 1—Percentage of total wildlife captured by camera monitoring after one year of camera establishment in the Xeromero valonia oak silvopastoral system in western Greece.

Presently there are more projects related to this oak forest that will provide tools and data for its management such as the AF4EU project that aims to create business models and strengthen extension services. Additionally, in fall 2024 two

more HORIZON EUROPE projects will be launched with dedicated activities in this oak forest: the DRYAD and SUSOIL projects. The DRYAD project will investigate the hydrological aspects and parameters that affect the forest, whereas the SUSOIL project will investigate the soil and carbon balance.

LITERATURE CITED

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