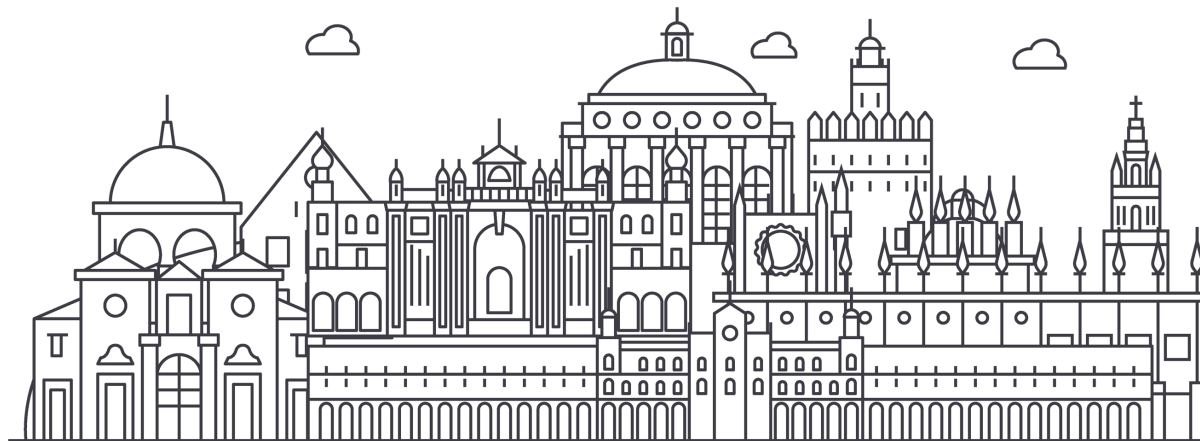




BEeS

The LifeWatch ERIC Biodiversity & Ecosystem eScience Conference

Seville
22-24/05/23



Threats and challenges to biodiversity and ecosystem conservation from an eScience perspective



SERPAM
Servicio de Evaluación,
Restauración y Protección de
Agrosistemas Mediterráneos

*Tracking livestock movements to aid in the environmental management
of the territory. Case studies from SUMHAL project in Andalusia
(Spain)*

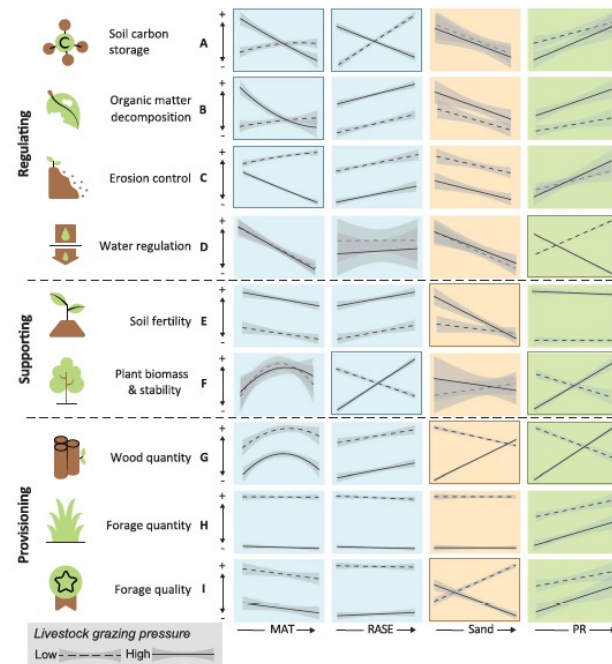
Extensive livestock offers different ecosystem services but also can cause different ecological and socioecological impacts, particularly in semi-arid regions.

Maestre et al. 2022
Science 378

Its proper management is important so that the territory can benefit from them and does not generate socioeconomic and environmental conflicts.

It has been highlighted that the **animals' mobility** is an important factor to consider in the assessment and research on potential impact of grazing on natural systems.

Manzano et al. 2023 Science
[10.1126/science.abq4062](https://doi.org/10.1126/science.abq4062)



WP7. Improving the sustainability of Mediterranean forests and silvopastoral agrosystems under climate change

Sub-projects LWE2103026 and LWE2103027 focus on analyzing the role of traditional silvopastorals in ecosystem biodiversity and in the prevention of forest fires in natural areas of Andalusia



SUMHAL

Sustainability for Mediterranean Hotspots
in Andalusia integrating LifeWatch ERIC



CSIC

CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS



SERPAM

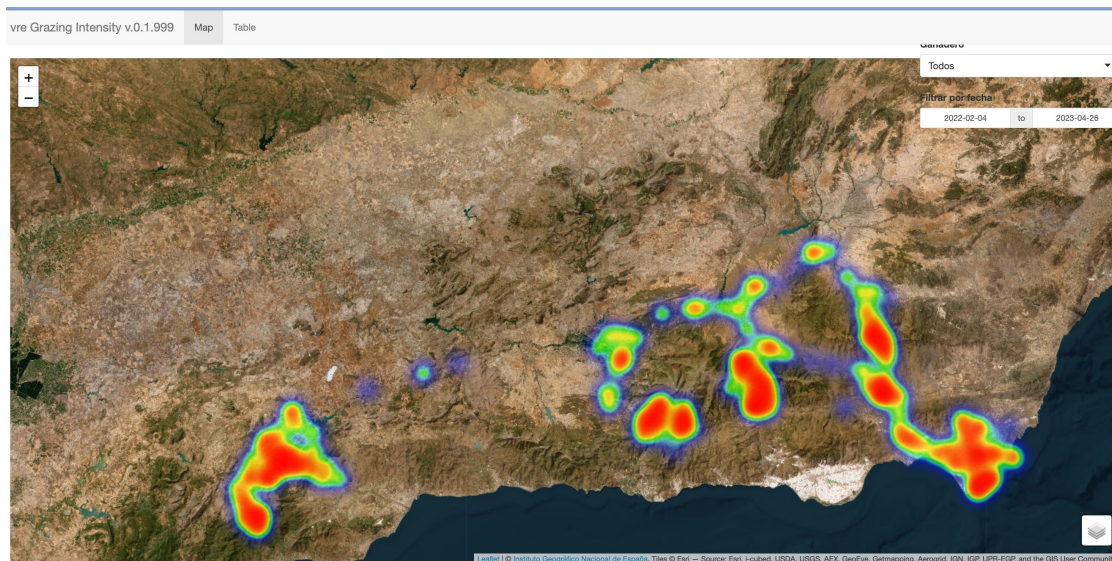
Servicio de Evaluación,
Restauración y Protección de
Agrosistemas Mediterráneos

vre Grazing Intensity

open-source application for managing and visualizing spatial data on livestock movement

Aim

to assist natural resource managers, scientists and farmers in analyzing and planning actions related to livestock and its interaction with biodiversity, fire prevention, and other factors.





BEEs

Seville, 22-24 May 2023

Threats and challenges to biodiversity and ecosystem conservation from an eScience perspective



Potential
Questions /
Interest

How is grazing
intensity and its
effect on plant
communities?



scientist

Potential
Users



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How is grazing
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What is the extent of
grazing intensity and
how does it affect
biodiversity?

Can we use
livestock farming
in the prevention
of forest fires?

Potential
Users

scientist



manager



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How is the
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Where do
livestock areas
typically occur?

Can we use
livestock farming
in the prevention
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Potential
Users

scientist



manager



farmer /
citizen



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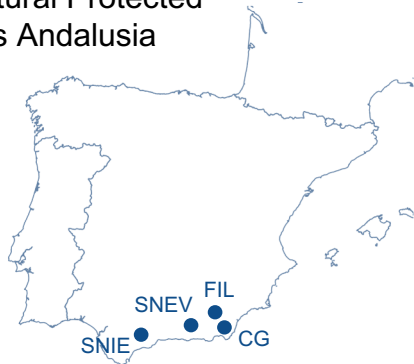
manager



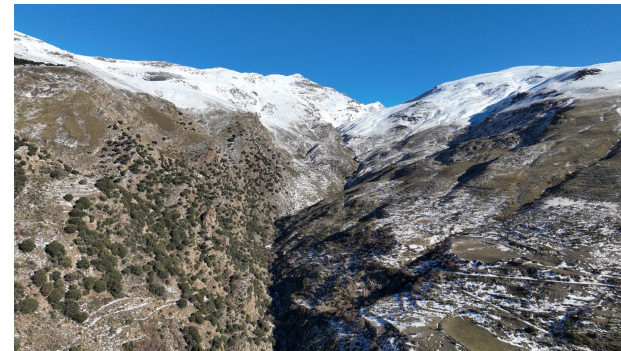
farmer /
citizen



4 Natural Protected areas Andalusia



Sierra Filabres



Sierra Nevada

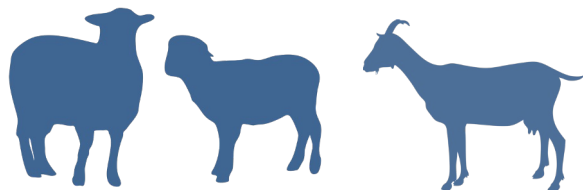
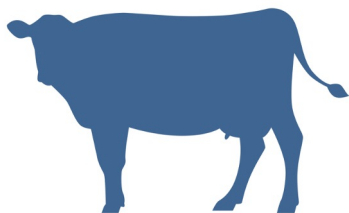
Cabo de Gata-Níjar



Sierra de las Nieves

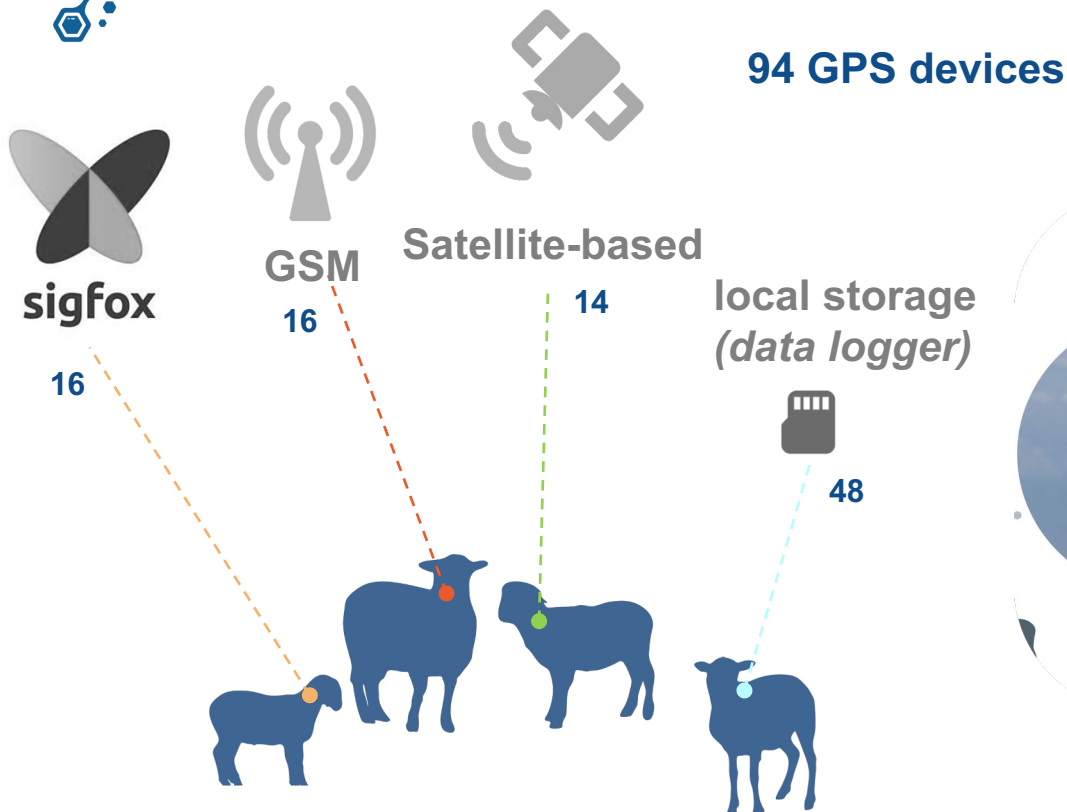


14 herds

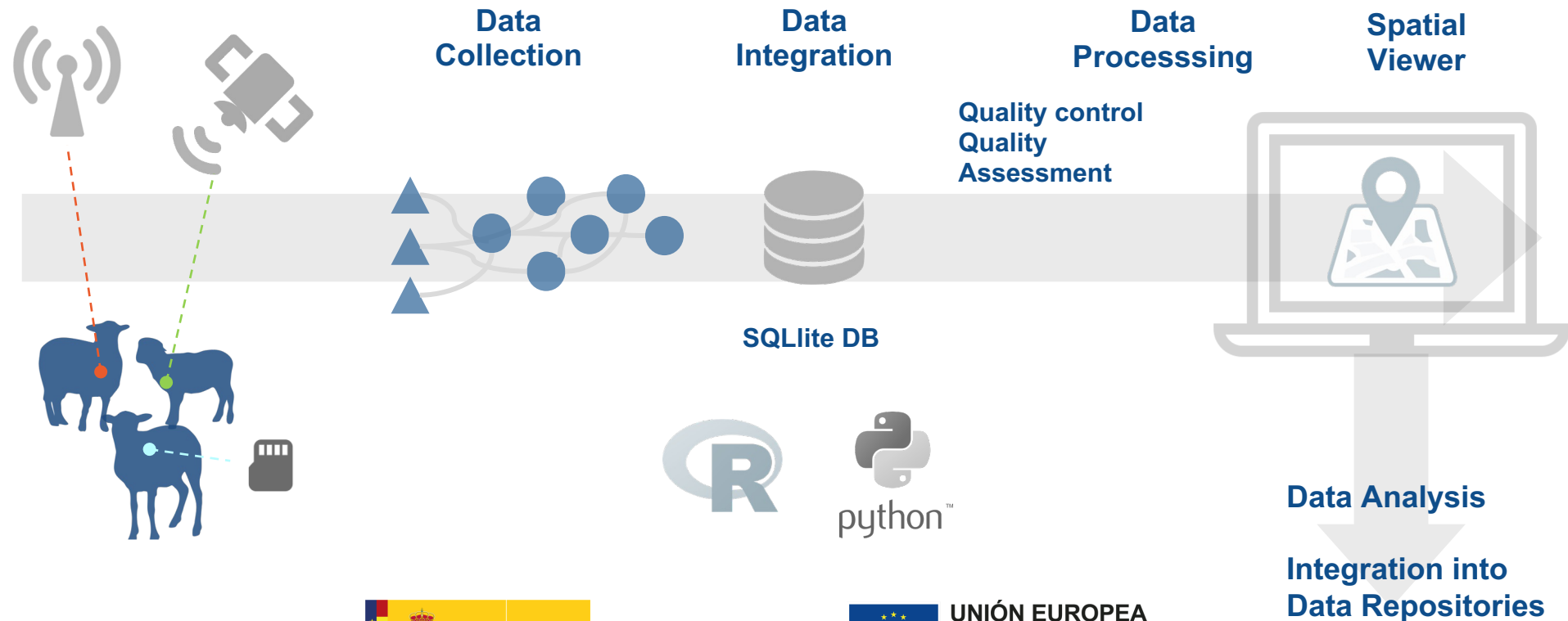


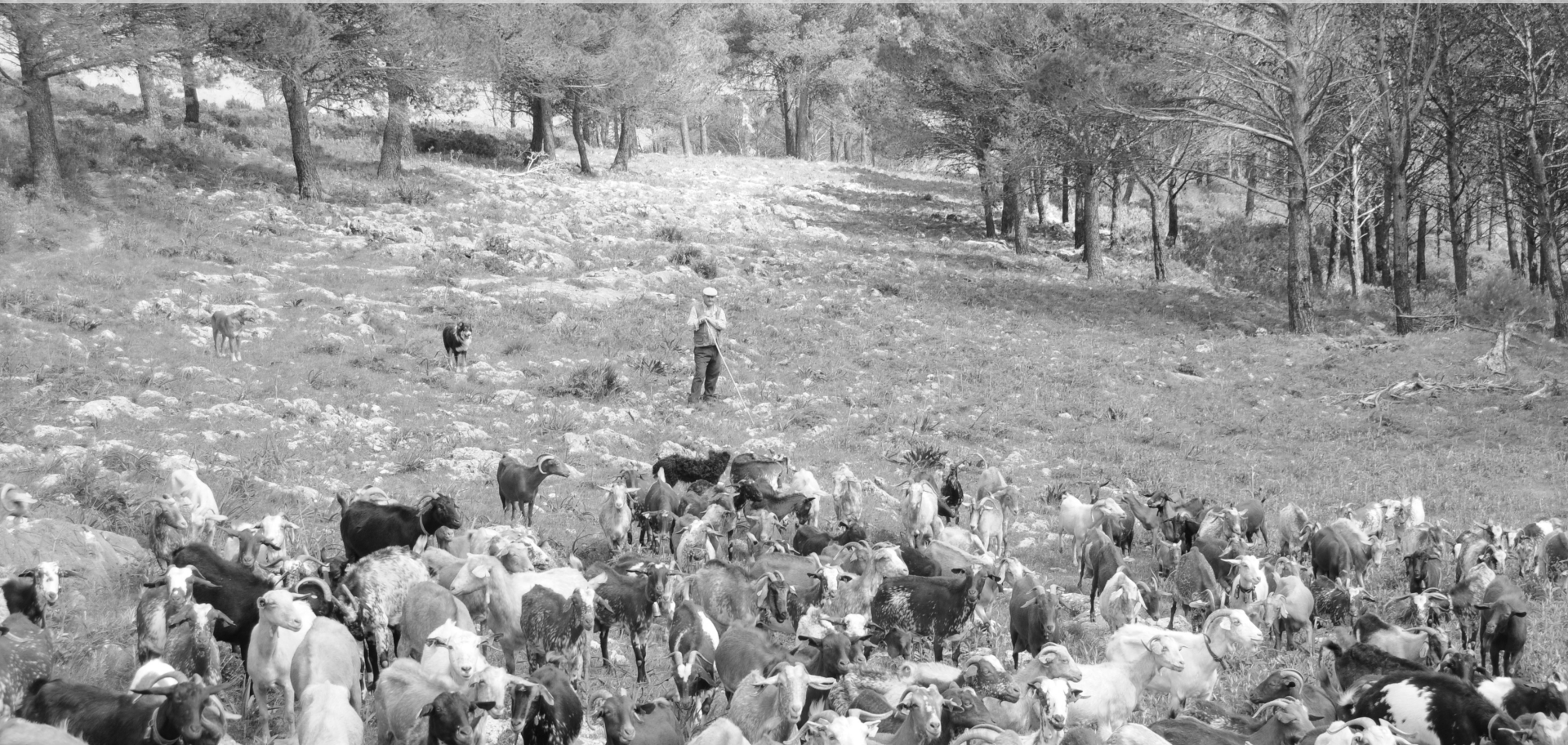
Herd sizes
300 – 1500 heads





Credits: M. Tognetti; DigitAnimal





Preventive Livestock Grazing (RAPCA programme)

Goat and sheep farmers are rewarded for helping with biomass reduction in fire-prone landscapes.

The RAPCA programme is a payment scheme that rewards shepherds for services of biomass control and fuel break maintenance on public forest land at high risk of wildfires. The reward is dependent on the size of the area, success, and difficulty of the effort.

Ruiz-Mirazo et al. 2012; Varela et al. 2018

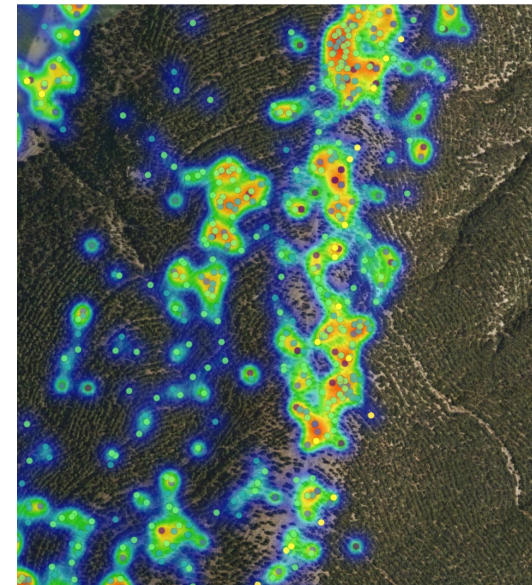
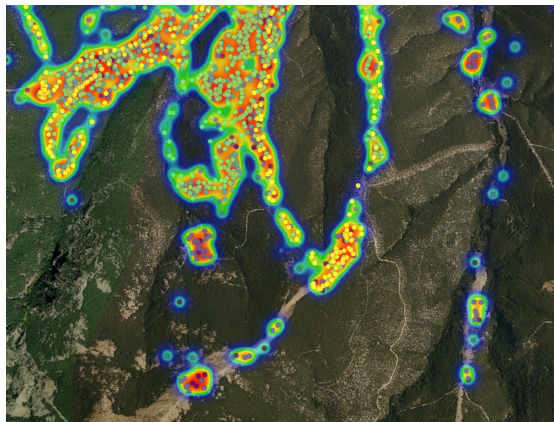
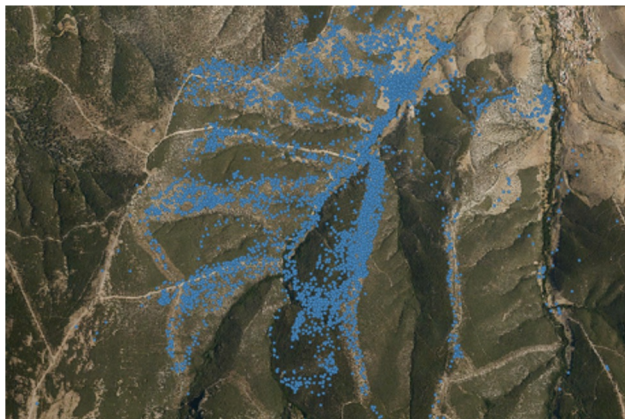


Graziers are required to consume a certain amount of vegetation growth annually, namely 90 % of herbaceous plants and 75% of shrubs. Contracts are made with the local environment and water agency, who also assess fuel breaks suitable for the programme, and the results of the grazing, leading to payments.

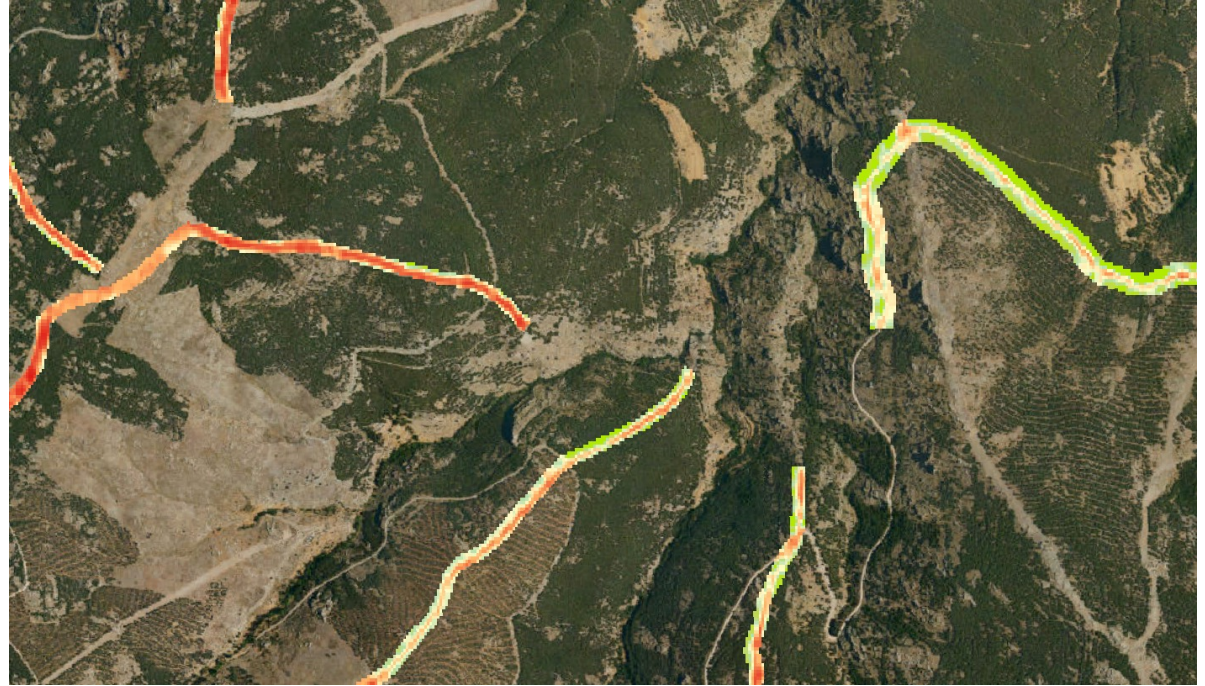
Monitoring of the livestock services is done once a year by field monitoring



This app could offer to technicians who carry out field evaluation, a tool that helps to have a spatio-temporal approach that improves the evaluation of the service provided by livestock.



Combination with assessment
of vegetation in the firebreaks
using remote sensing



Antirrhinum charidemi Lange

Critically Endangered



One the main threat is the high pressure by goat livestock

Distribution of *Antirrhinum charidemi* Cabo de Gata-Níjar (Almería, Spain)

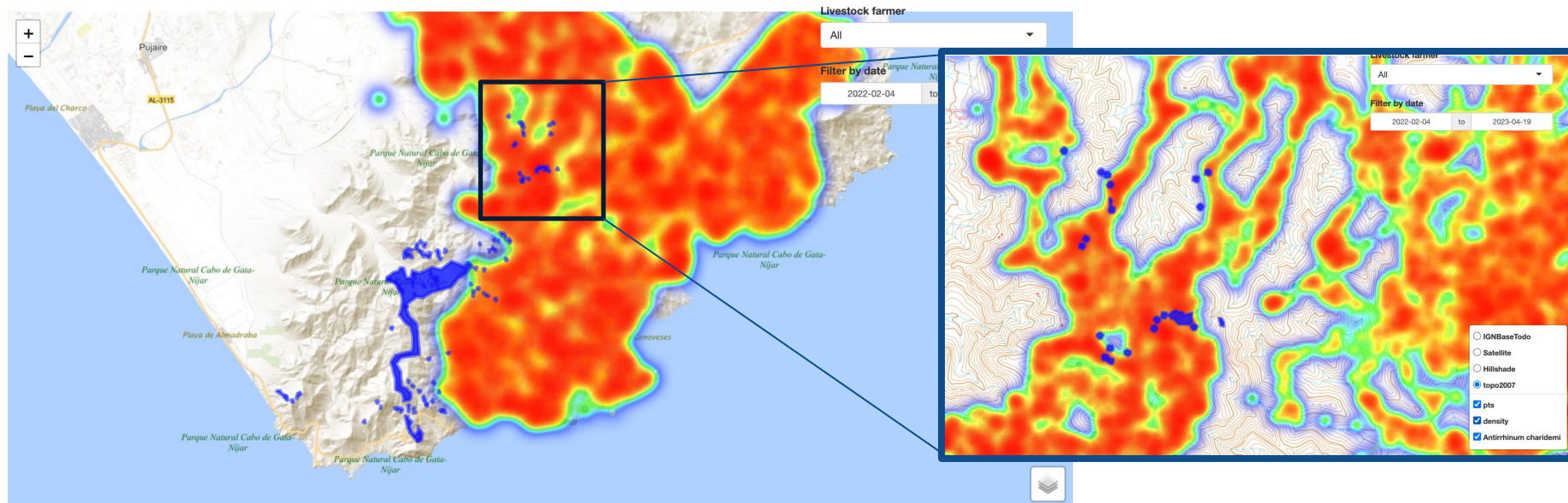


The app could aid to natural resource managers to know more precisely what populations of this plant species is more impacted by the goat livestock

Livestock and Biodiversity

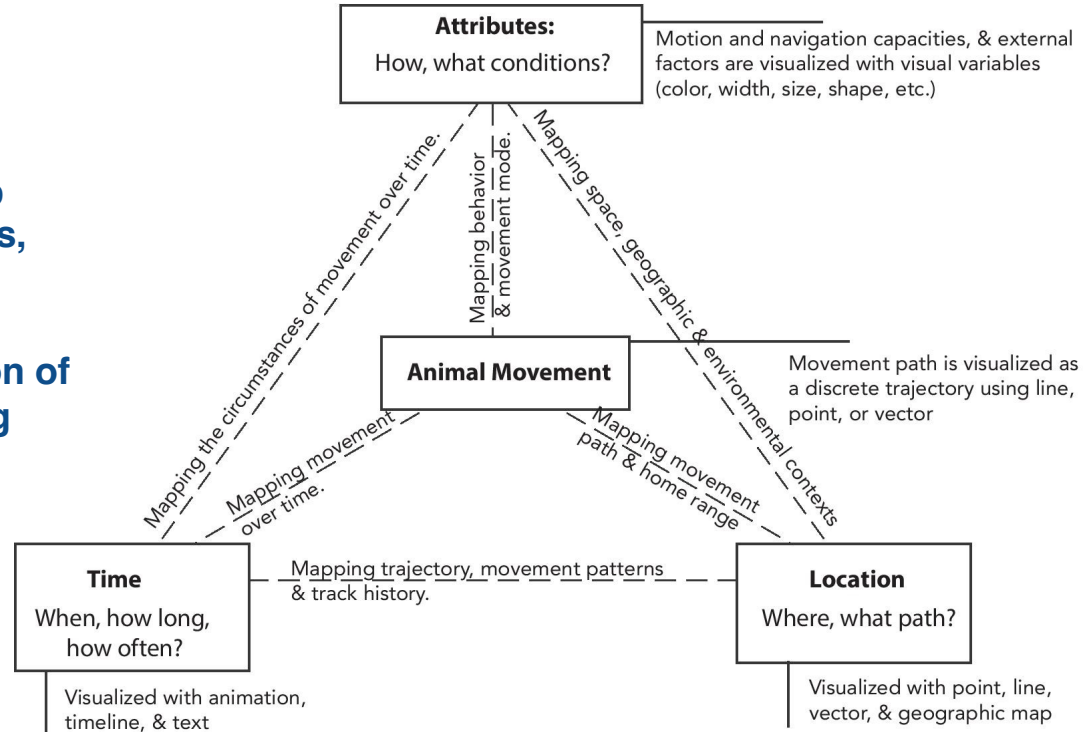
Map

Table



Next steps

- Generate a stable version of the app that can be directly used by managers, scientists and livestock farmers
- Compute and show other information of interest derived from GPS positioning data such us:
 - Mapping movement paths
 - Temporal pattern of movments
- Integration into data repositories (eg. movebank)


 Dodge et al. 2021. 9:55 (*Animal movement*)

Thank you!

This work received funding from MICINN (FEDER funds) within the LifeWatch ERIC - SUMHAL project (SUMHAL, LIFEWATCH-2019-09-CSIC-13, POPE 2014-2020) (<https://lifewatcher-eric-sumhal.csic.es>).





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