Newsletter Nr. 7

A service to measure and improve biodiversity using satellite data for monitoring, evaluation and optimization of CAP greening initiatives

Horizon Europe Research and Innovation Programme

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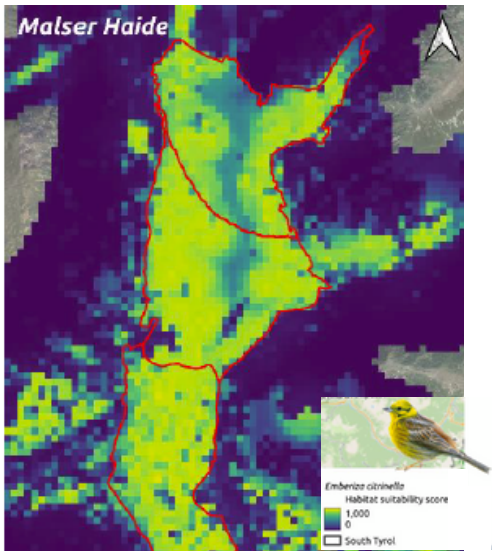
Image source: Atlas der Brutvögel Südtirols 2010-2015



BirdWatch has entered its testing phase. The development of its features and functionalities, at least for the prototype, are now being finalised.

This newsletter issue focusses on our results for and demonstration activities in our project region **South Tyrol**.

Our project partner Eurac Research presented their Earth Observation-based products relevant to explore the farmland environment in the Italian province of South Tyrol. Among others, the BirdWatch platform could help, for example, to identify new areas for bird protection on farmland.

Here, we briefly summarise some of the key takeaways.

In the fall, NPA continued to showcase BirdWatch, this time at the 24th Conference of the Baltic and Polish Paying Agencies, of which Lithuania was the host.
Focus was “Innovations and Technologies – the Driving Force of the Strategic Plan for Agriculture and Rural Development 2023–2027”, which included good farming practices and the use of artificial intelligence.

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FARMLAND BIRD HABITATS IN... SOUTH TYROL

For the province of South Tyrol, two types of habitat models were developed (for a description of our approach, please check out our previous newsletters*!).

Due to the starkly different environment of the European Alps compared to our other project regions, we assumed that we might also need different environmental variables to describe bird habitats in South Tyrol.

Thus, additional, regionalised models were built, putting stronger emphasis on local topography and the distribution of grassland (Figs. 1 & 2).

The Natural Museum of Bolzano as well as the Institute for Alpine Environment allowed us to use their species occurrence data for developing habitat models.

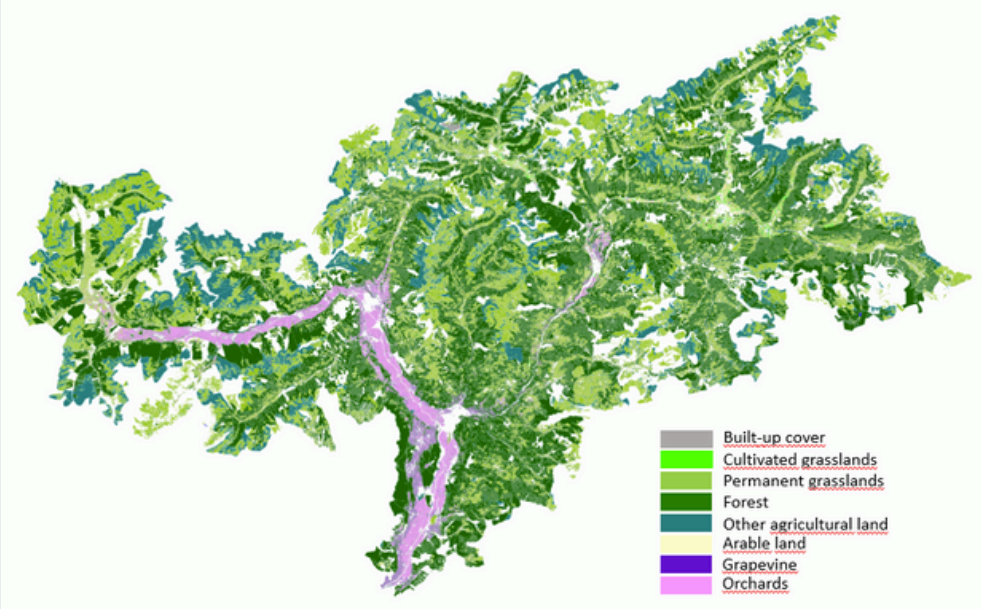

Figure 1: Land cover types across South Tyrol

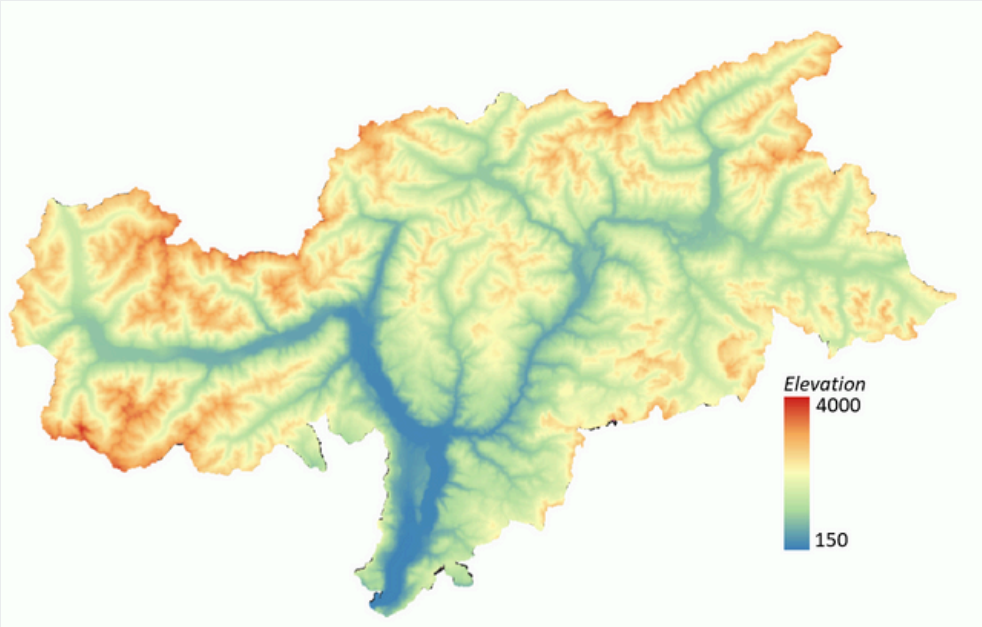

Figure 2: Elevantion across South Tyrol

*Download our newsletters here

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FARMLAND BIRD HABITATS IN... SOUTH TYROL

Agricultural parcel data provided us with the boundaries of farmland as well as with the types of crops grown on them.

Satellite data allowed us to assess the climate conditions and types of land cover in the areas where the birds were recorded and thus also the range of conditions under which they occur.

We calculated the habitat suitability first for the year 2022, as the amount of species data turned out to be highest for that year.

The resulting habitat suitability maps (Fig. 3) indicate pronounced differences between species.

Alauda arvensis (topmost map) finds favourable conditions only at a few locations. In contrast,

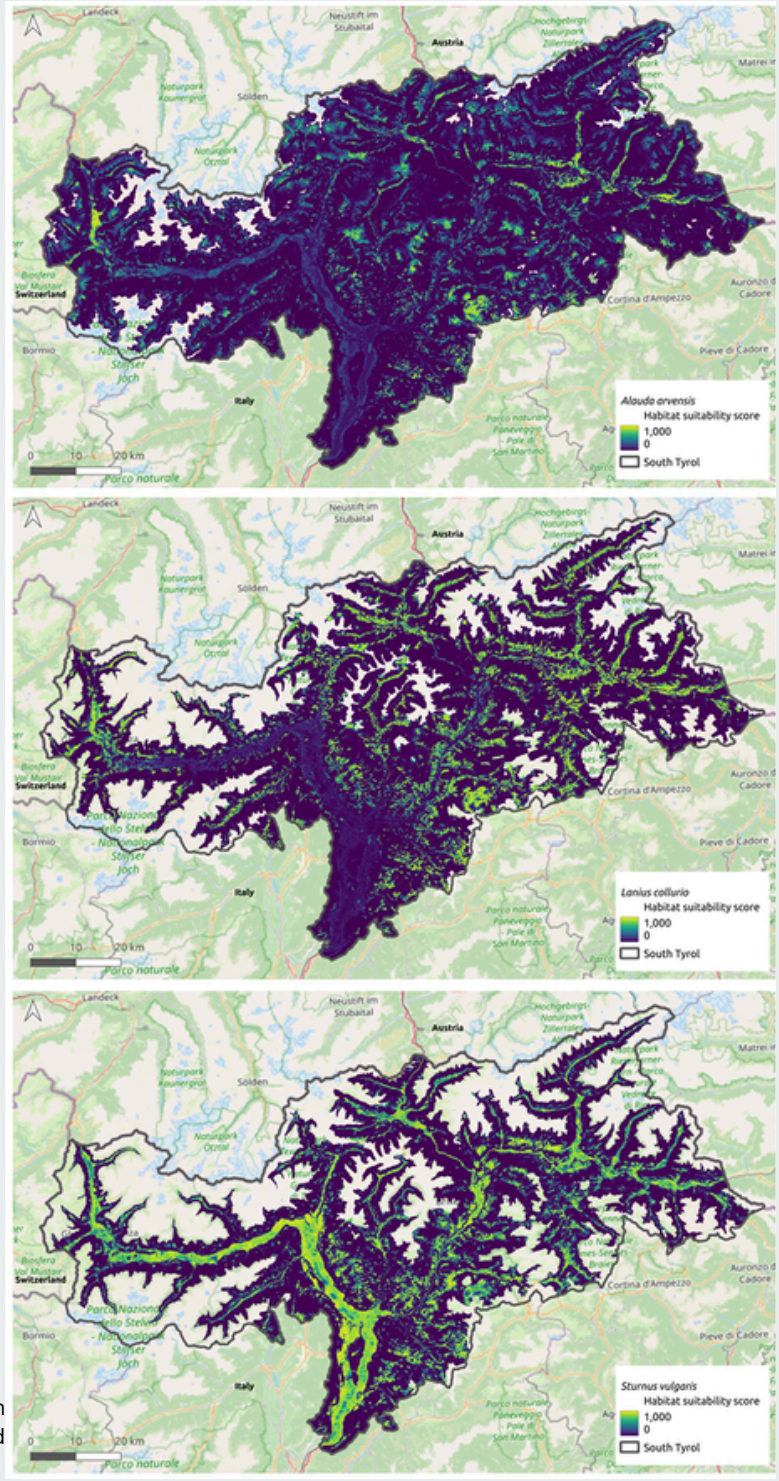

Figure 3: Habitat suitability across South Tyrol, for three different farmland bird species; Background map: Google Maps

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Streptopelia turtur (lowest map) can find many more places suitable for breeding.

Another, more general observation is an abundance of low suitability farmland coinciding with more steeply sloped as well as higher elevated areas (Fig. 2) in the province.

This can reflect both a prevalence of monitoring birds in the lower lying regions of South Tyrol as well as unfavourable conditions, including related to the mowing regimes on the alpine pastures or elevations above a certain threshold.

Interaction with local ornithologists or ecologists can support the interpretation of these maps, helping to determine, which possibility is the most likely.

In Fig. 5, we return to the Mals Heath, which was already the focus in Newsletter #3.

Mals Heath is especially important for farmland birds in South Tyrol (location is depicted in Fig. 4), as it is currently the only area within the autonomous province where farmland bird protection is funded under the EU's Common Agricultural Policy*.

The success of the protection measures can be inferred from our habitat suitability maps (Figs. 3 and 5), where the Mals Heath shows fairly consistently higher habitat suitability values compared to other areas in the province.

Additionally, the distribution of suitability values (Fig. 5) appear to reflect the three mowing regimes, predetermined for the area.

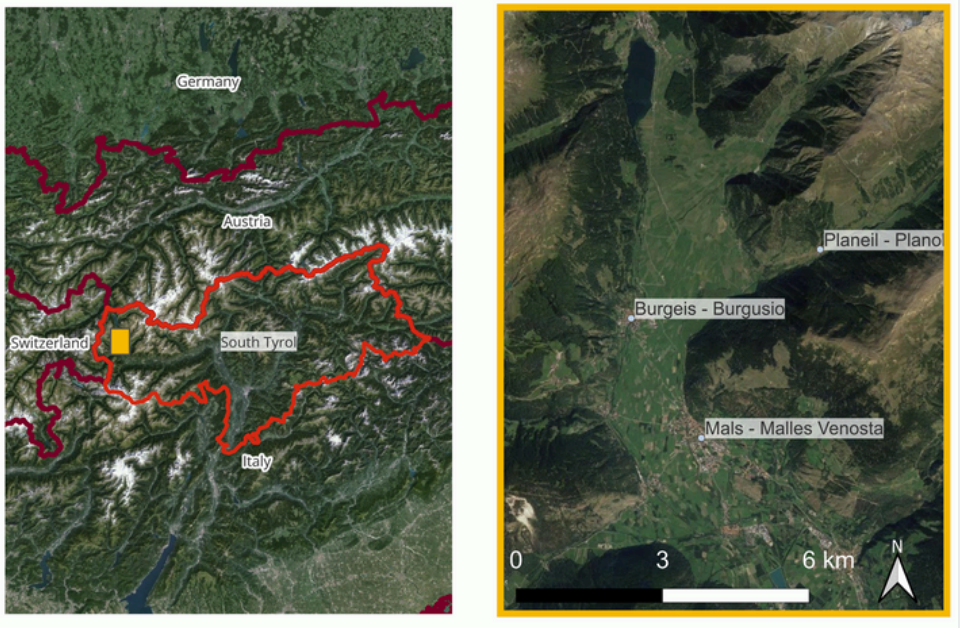

Figure 4: a) Location of the Mals Heath within South Tyrol; b) close-up of the area of the Mals Heath; Background map: Google Satellite

*Learn more about bird protection on Mals Heath

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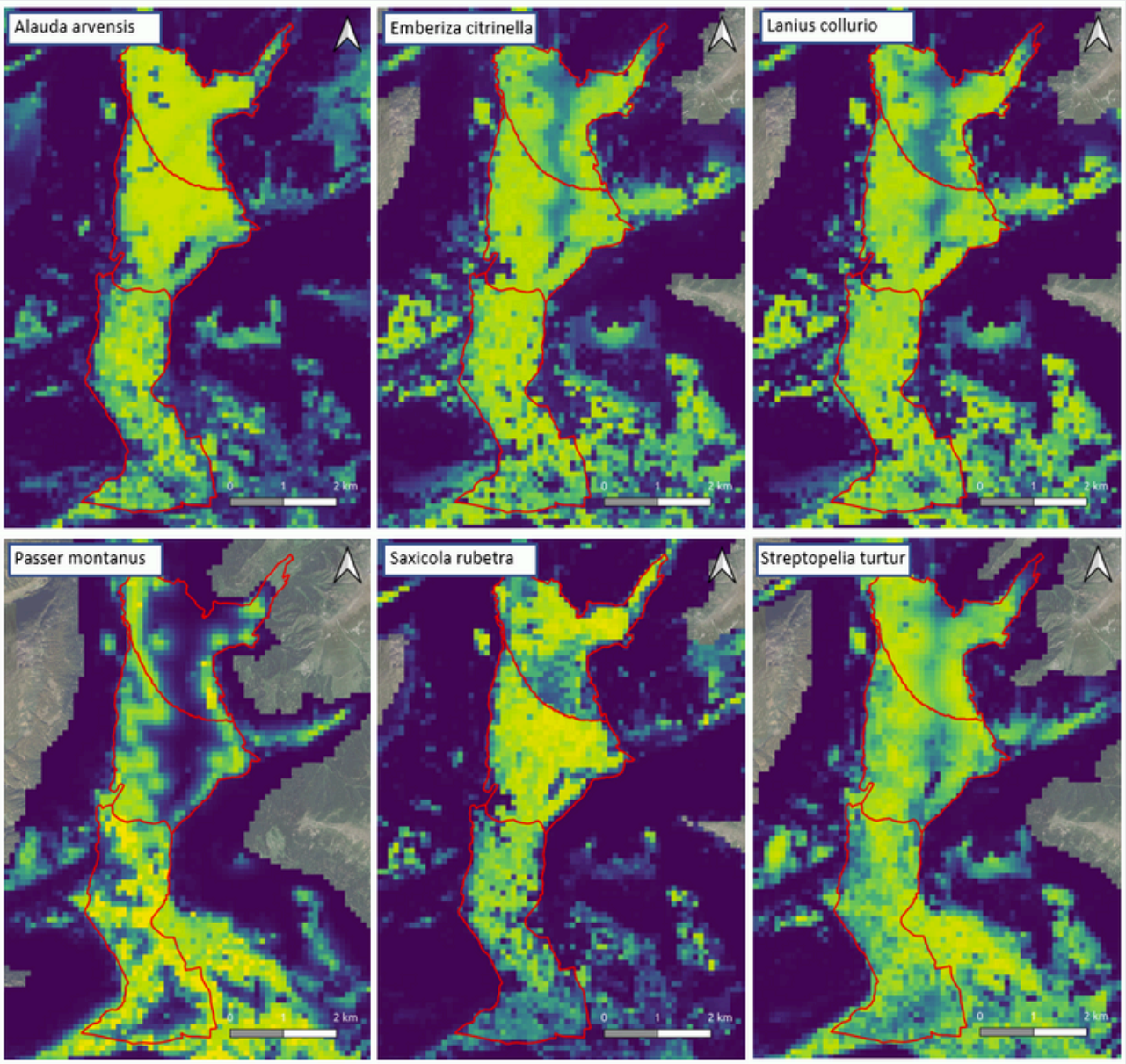

Figure 5: Habitat suitability of the Mals Heath for individual bird species; Red lines delineate the different sub-zones for which different initial mowing dates are mandatory;
Background map: Google Satellite

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In December, BirdWatch, along with other examples of Eurac Research's research and development activities, was presented to potential users in South Tyrol.

The goal was to introduce the participants to Eurac Research's range of research and development activities aiming to provide a holistic picture of the fragile Alpine environment.

The presentation started out with an overview of satellite sensors used to derive environmental parameters, followed by an explanation on how satellite data can be used to detect mowing events, an important aspect in South Tyrol, where grassland is abundant.

Then, the focus was shifted towards bird protection, by introducing attendants to the protection programme for meadow birds breeding on the Mals Heath.

Here, too, mowing events were derived using satellite data, both with freely available medium and commercial high resolution imagery.

The presentation finished by introducing the audience to the BirdWatch platform (Fig. 6).

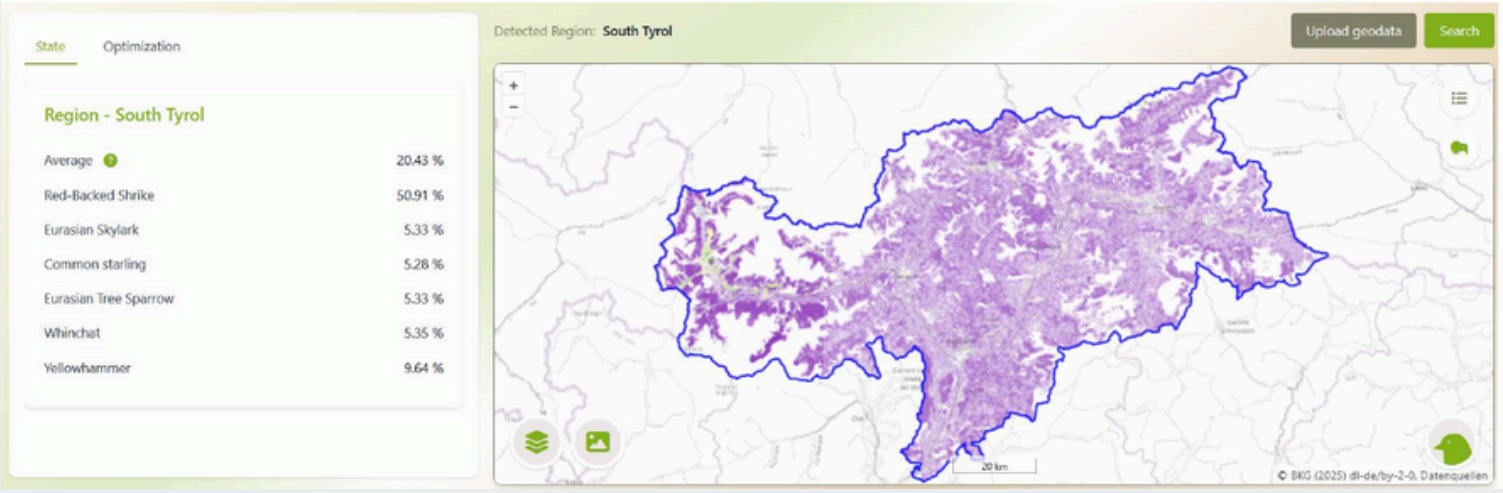

Figure 6: Frontend view of the BirdWatch platform, as shown to the participants at the stakeholder event organised by our partners at Eurac Research

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DEMONSTRATING!... IN SOUTH TYROL

Eurac showcased region-specific results, consisting of a time series of habitat models, stretching from 2017 to 2024, and discussed the rationale behind spatial optimisation for bird protection and the shaping of environmental policies.

In particular, this included a reflection on the question of how to achieve species protection goals efficiently, and within the limits of available funding.

Apart from helping to identify hot spots and regions requiring action, habitat suitability can be an input for the assessment of any trends in a region and to evaluate the success or failure of implemented measures.

The aim of the presentation was to verify these assumptions regarding the potential of BirdWatch to support policy-making and evaluation.

For example, due to the success of the Mals Heath, a 2nd, similar programme is being considered. Species-specific habitat suitability maps can help identify candidate areas and subsequently assess any changes, once measures are being implemented.

The latter can, e.g., take the shape of a timeseries analysis to identify changes (Fig. 7).

Overlaying timeseries for different bird species can shed light on divergent trends, potentially due to activities or measures favouring one species over another.

Maps like this can serve as a common discussion base between, e.g., policy-makers, farmland managers and ecologists, to disentangle the factors leading to trends in habitat suitability and adjust policies and agri-environmental measures accordingly.

This was also confirmed by participants at Eurac's workshop. The platform was regarded as a potentially very valuable tool for farm advisors, supporting them in their daily work.

Institutional representatives were very satisfied with BirdWatch's habitat suitability maps and see its potential in supporting the implementation of the EU Nature Restoration Law.

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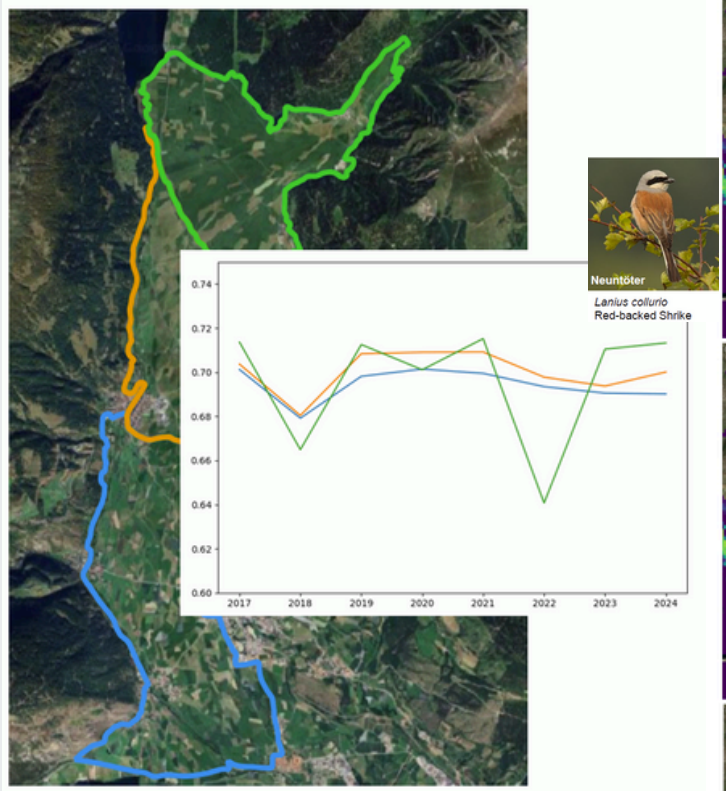

Figure 7: Average habitat suitability per mowing regime (colour-coded) and year for the Lanius collurio;
Background map: Google Satellite

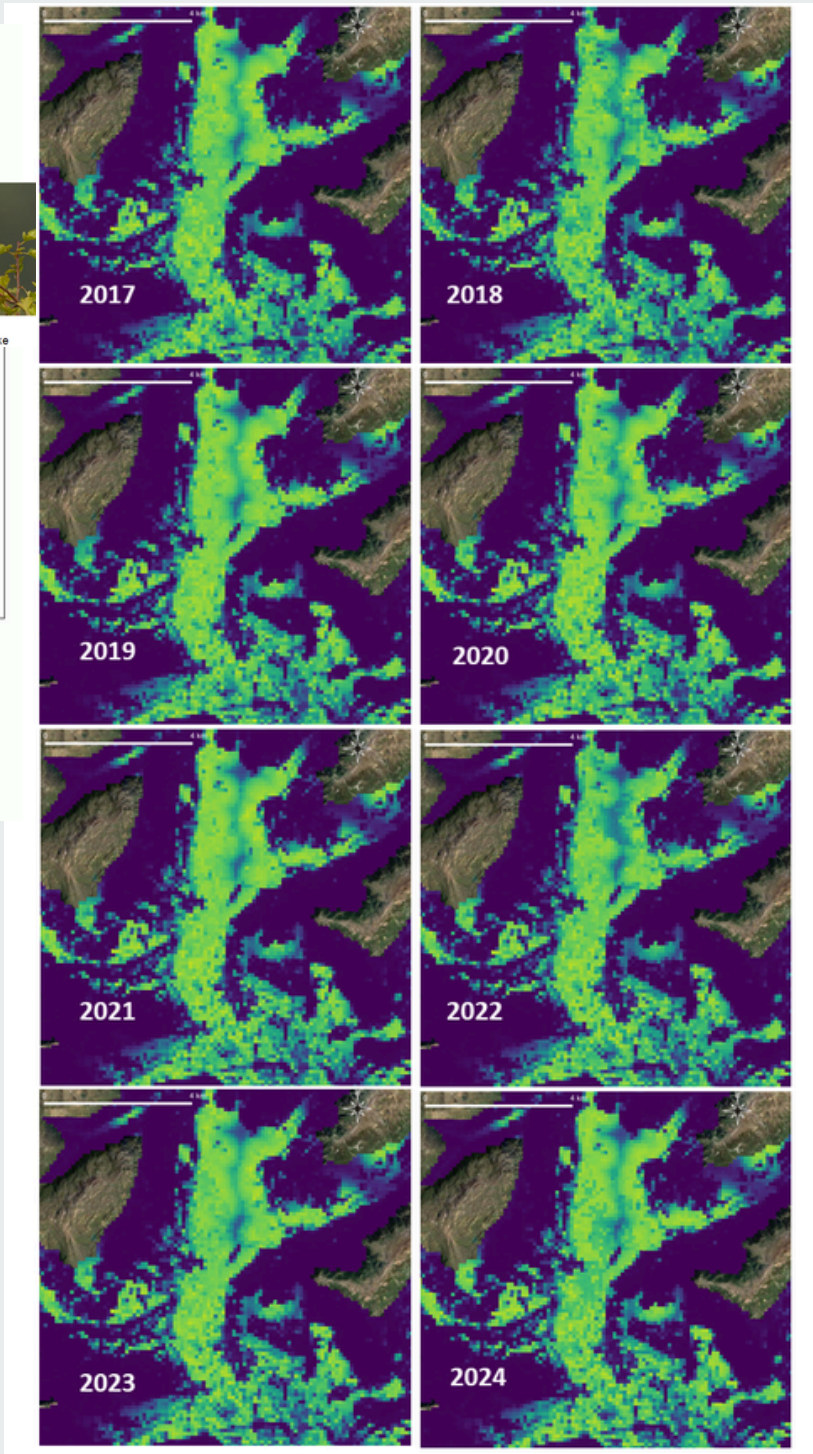

Figure 8: Mals Heath' habitat suitability for the Lanius collurio, calculated for the years 2017 to 2024;
Background map: Google Satellite

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BIRDWATCH AT THE CONFERENCE OF THE BALTIC AND POLISH PAYING AGENCIES

On 24–26 September 2025, our project partner NPA invited the paying agencies of the Baltic States and Poland to the conference "**Innovations and Technologies – the Driving Force of the Strategic Plan for Agriculture and Rural Development 2023–2027**".

The conference was dedicated to current issues in the agricultural sector, innovations and sharing experience in supporting the administration.

NPA's Director Fortunatas Dirginčius welcomed the conference participants and emphasized that today, when implementing the Strategic Plan for Agriculture and Rural Development of Lithuania 2023–2027, many tasks are being accomplished by robots and automated systems.

He also referred to the new monitoring tools available to both policy-makers and farmers.

Presentations included those by NPA's Director Forunatas Dirginčius on digital solutions in implementing the Strategic Plan and of the Latvian paying agency representative about shared Earth Observation platforms, insights from private innovation providers (e.g., image classification, use of Sentinel-2 data).

Representatives of the paying agencies from Lithuania, Latvia, Estonia and Poland (Fig. 8) discussed the digital and information technology solutions used in their activities and stressed their importance in administering support measures.

NPA Deputy Director Tomas Orlickas focused on the NPA's international projects, the interplay of support measures under the Strategic Plan, and lessons learned through its implementation. The international projects present elements integrated in an overall digital ecosystem that includes parcel delineation, crop classification, and remote sensing, supporting Lithuania's CAP Strategic Plan and more biodiversity-sensitive agricultural policy.

Tomas Orlickas also highlighted the BirdWatch project, positioning it as a source for farmland biodiversity indicators for spatial planning and spatio-temporal analyses, provided in the shape of an online platform.

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Figure 9: Participants at the 24th Conference of the Baltic and Polish Paying Agencies which took place in Lithuania in 2025; Source: NPA

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VITO - Vlaamse Instelling voor Technologisch Onderzoek
https://vito.be/en

National Paying Agency under the Ministry of Agriculture of the Republic of Lithuania
https://www.nma.lt

Bioland e.V.
https://www.bioland.de/

Agro Digital Solutions
https://www.agrodigitalsolutions.eu

Research Institute for Nature and Forest
https://www.vlaanderen.be/inbo/en-gb/homepage/

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