



# **D1.1 Minutes of the Kick-Off Meeting**

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**Deliverable for the Horizon Europe Project BirdWatch**

**Version 1.0**



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## Document Information

|                                  |                                                                                                                                                                                            |                            |                  |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------|
| <b>GA Number</b>                 | 101082634                                                                                                                                                                                  | <b>Type of Action</b>      | Horizon-IA       |
| <b>Full Title</b>                | BirdWatch - a Copernicus-based service for the improvement of habitat suitability of farmland birds via satellite-enabled monitoring, evaluation and optimisation of CAP greening measures |                            |                  |
| <b>Project Acronym</b>           | BirdWatch                                                                                                                                                                                  |                            |                  |
| <b>Start Date</b>                | February 1 <sup>st</sup> , 2023                                                                                                                                                            | <b>Duration</b>            | 36 Months        |
| <b>Project URL</b>               | <a href="https://birdwatch-eu.lup-umwelt.de/">https://birdwatch-eu.lup-umwelt.de/</a><br>(temporary, until domain is final)                                                                |                            |                  |
| <b>Deliverable</b>               | D1.1: Minutes of the Kick-Off Meeting                                                                                                                                                      |                            |                  |
| <b>Work Package</b>              | WP1                                                                                                                                                                                        |                            |                  |
| <b>Project Month of Delivery</b> | <b>Contractual</b>                                                                                                                                                                         | M1                         | <b>Actual</b> M2 |
| <b>Nature</b>                    | Data                                                                                                                                                                                       | <b>Dissemination Level</b> | Pub              |
| <b>Lead Beneficiary</b>          | LUP - Luftbild Umwelt Planung GmbH                                                                                                                                                         |                            |                  |
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## History of Changes

| Version | Issue Date | Stage | Description         | Comments | Contributor     |
|---------|------------|-------|---------------------|----------|-----------------|
| 1.0     | 06.03.2023 | Draft | First Draft of D1.1 |          | Nastasja Scholz |
|         |            |       |                     |          |                 |
|         |            |       |                     |          |                 |
|         |            |       |                     |          |                 |



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## Background on BirdWatch

BirdWatch is a Horizon Europe Project on the development of a service for the monitoring and improvement of habitat suitability of agricultural landscapes for farmland bird species.

Within the next three years, well-established Earth-Observation data-based features will be combined with a species distribution modelling framework in order to generate new monitoring capabilities of habitat suitability in terms of EO-data-measurable quantities. These quantities will include, e.g., the presence, distribution and arrangement of structural elements on agricultural land, including hedgerows, trees and bushes or the distance to, e.g., freshwater sources but also landcover descriptors, such as vegetation type or vegetation vitality indices.

Farmland bird species were chosen as our focus as the number of farmland birds is diminishing especially rapidly, while these bird species also serve as widely acknowledged indicators for the health of an ecosystem.

Combining species distribution models with the geospatial features mentioned in the previous paragraph will allow for the derivation of occurrence probability maps for bird species. With the frequent acquisition of freely available satellite data from Sentinel-1 and Sentinel-2 of the Copernicus Program of the European Space Agency (ESA) as well as from the National Aeronautics and Space Administration's (NASA) Landsat series, such habitat suitability maps can be renewed continuously, if necessary up to several times per month.

This will provide relevant stakeholders and decision-makers with a new service to evaluate and monitor habitat suitability for farmland birds in the EU. Farmers and farming organisations will have access to monitoring data, allowing them to check the habitat suitability of their own land. Administrative and legal personnel on national, regional and EU-levels will be able to carry out compliance checks and the monitoring of the effectiveness of eco-schemes relevant for farmland birds. Similarly, NGOs and ornithological associations will receive novel information on the ecological health of their target region. Policy-makers can decide on the adaptation or removal of specific eco-schemes based on data reflecting the success of an eco-scheme to improve habitats in specific regions.

On top of the monitoring service, an optimisation service will enable the comparison of the outcomes of different pathways before making a decision. This can include the optimal configuration of crop distribution per farm holding or the optimal tradeoff between important eco-schemes and budget consideration. The latter should help to optimise the outcome of the eco-scheme in terms of their positive impact on the farmland bird habitats, especially since less effective eco-schemes might be chosen if only budget constraints are taken into account.

The monitoring and optimisation capabilities will be combined into the BirdWatch service, available via a web-based front-end.



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## Consortium Members

### Luftbild Umwelt Planung GmbH – LUP

The LUP was founded in 1996 and is a SME with about 25 employees, with expertise in environmental management, remote sensing, geoinformatics and environmental information management. LUP's core business areas are:

1. Environmental Management - Management planning for protected areas (e.g. Natura2000 sites, national & nature parks) and for climate change adaptation measures
2. Remote Sensing (optical & radar, air- & spaceborne) for environmental analyses (e.g. vegetation mapping, biodiversity assessment, soil moisture, biomass, organic carbon, time-series)
3. Geoinformatics (e.g. thematic data analysis, habitat modelling, software development)
4. Information Management (web-based presentation, geodata-infrastructure, cartography).

While being a private company, LUP has a broad project experience in nature conservation, regional planning and management applications as well as in research & development projects.

LUP is leading the BirdWatch consortium and in charge of the work packages WP1000, WP2000 and WP6000, described further down in the section on the Work Packages.

### Singerise

Singerise is a company with strong expertise in the development and provision of Geo Information Systems (GIS). It was founded in 2008 and currently employs more than 85 people. The main focus of Singerise is to provide IT solutions for agriculture, land administration and Earth Observation. With Sentinel Hub they have built a powerful, widely known platform which combines various EO data, including, open and commercial satellite imagery, with machine learning approaches, accessible via a Cloud API as well as via mobile and web applications. Their Cloud API has about 230000 registered users, their EO Browser has 180000 visitors each month. So far, Singerise has processed about 70 Million requests from all over the world.

Singerise shares the responsibility for work package WP3000 with EURAC.

### EURAC

EURAC is a private non-profit research centre which was founded in 1992 and currently employs about 600 people. It consists of eleven research institutes and five research centres, one of which is the Institute of Earth Observation. The main focus of this institute is to

- Monitor and understand key environmental dynamics and the impact of climate change in mountain regions
- Provide openly accessible knowledge and scientific support to local, regional and international institutions and stakeholder
- Using a wide range of scientific methods such as Earth Observation (EO), climate science, data science, modelling, risk assessment with interdisciplinary and participative approaches

Therefore, the key areas in EO focus on the monitoring of land surfaces for mountain environments and its dynamics, including the water resources, the cryosphere, and vegetation and land-use dynamics. Apart from environmental monitoring, EURAC also uses EO to study natural



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hazards, to determine climate change impacts as well as to assess and manage related risks. To be able to do this, the third focus lies on the research and implementation of innovative solutions for simple EO data access and processing.

EURAC will add its expertise to the fulfilment of work package WP3000.

### **University of Potsdam - UP**

UP is represented in BirdWatch via the Ecology & Macroecology lab. The Ecology & Macroecology lab is headed by Prof. Dr. Damaris Zurell. Their research broadly focuses on patterns and drivers of biodiversity dynamics under global change. They combine approaches from macroecology, conservation biogeography, movement ecology and modelling to improve the mechanistic understanding and predictability of spatiotemporal biodiversity patterns across scales.

Prof. Dr. Zurell is a leading expert on species distribution modelling and has contributed to development of methods and standards in the field. She has a strong record of providing open access to modelling tools as well as elaborate tutorials on the different tools. She has long-standing experience working with bird distribution data on various spatial and temporal scales that ideally complements the project consortium.

The UP will handle the tasks work package WP4000.

### **VITO**

VITO is a Flemish institute, focused on technological research. Among their research domains are land use, chemistry, health, energy and materials, with 43 granted patents under the hood. VITO has almost 1000 employees, coming from 45 different nations. Among the products and services, VITO provides a supply chain optimisation service, the MooV model. MooV is used to determine the optimal supply chain configuration (in terms of economic, environmental or social constraints). It is customisable for specific needs, goals and constraints of the client (highly constrained) and allows for the determination of sustainable, circular, biobased strategies. With MooV, VITO supports decision making, analysing alternative strategies/supply chain variations - and experimenting with a virtual supply chain. MooV is used to simulate the impact of potential changes and critical decisions in the supply chain and examine the robustness of the network by performing sensitivity analyses.

VITO will bring its experiences and capabilities into BirdWatch through work package WP5000.

### **National Paying Agency of Lithuania – NPA**

The NPA is the only paying agency in Lithuania, in charge of distributing all EU and national subsidies to farmers, businesses and communities in rural areas. The yearly amount paid to the clients amounts to about 1 billion Euros.

The NPA has its headquarters in Vilnius, with nine additional regional units, employing a total of 720 people and serving a total of ~ 150000 clients.

The NPA has in depth experience with the usage of Earth Observation data, artificial intelligence and utilisation of geo-tagged photos for the monitoring of agricultural and environmental activities. Additionally, the agency educates farmers on the benefits of Earth Observation data, innovative solutions and tools for sustainable, more effective farming.



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The NPA is currently involved in eight Horizon Europe projects, three ESA projects and one LIFE project as well as one Interreg project, among numerous further international projects. The NPA shares the responsibility for work package WP7000 with Agro Digital Solutions.

### Agro Digital Solutions – ADS

ADS is based in Lithuania and is a non-governmental and non-profit organisation. It develops and promotes Earth Observation-enabled solutions, Geo Information Systems, drone-based, software and mobile solutions in Lithuania, the EU, the Balkans and East Asian countries.

Its target clients are farmers and public institutions, to whom the ADS promotes effective, environmentally friendly and biodiversity-focused farming. The ADS facilitates the dialogue between different stakeholders, including regional and rural public institutions and farmers organisations.

It also educates farmers and businesses on the benefits of Earth Observation data, innovative solutions and tools for sustainable, more effective farming.

ADS is currently involved in three Horizon Europe projects and numerous national projects.

ADS will add its expertise to the fulfilment of work package WP7000.



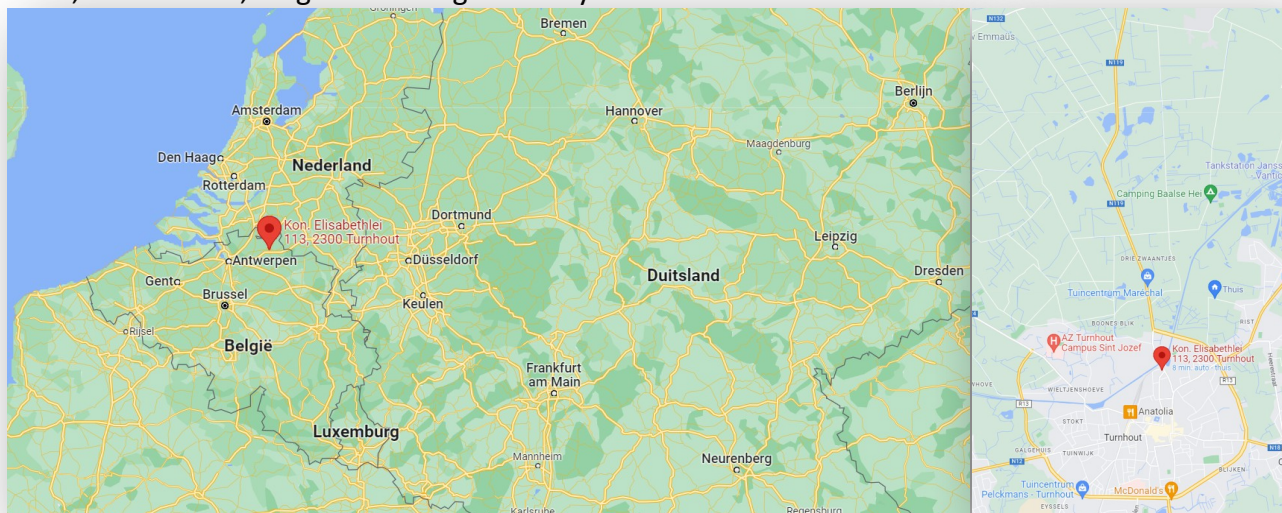
**Fig. 1:** Group photo of the project partners who could participate on-site in Turnhout, Belgium



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## Introduction

The official Kick-Off of the BirdWatch Horizon Europe Project was held on the 28th of February, 2023, in Turnhout, Belgium and organised by consortium member VITO.



**Fig. 2:** Google Map of location of the Kick-Off Meeting in Turnhout, Belgium

The meeting location was at *Gustaaf Klimt*<sup>1</sup>, a venue initially dedicated to the climbing community, but which now additionally provides space to convene in larger groups. The reason behind this choice was that Gustaaf Klimt also served as the ideal starting and end point for the visit of the LIFE Nardus & Limosa project on the day before the kick-off (the agenda of the pre-kick off event can be found in the Appendix of this document).

Nardus & Limosa is of relevance to BirdWatch as it focuses on agricultural land. “Nardus” stands for Nardus grasslands (priority habitat 6230), while “Limosa” stands for meadow birds. *Limosa limosa* (black-tailed godwit) is one of the target species for BirdWatch. Additionally, Nardus & Limosa demonstrates the importance of trade-offs: measures that benefit one species are sometimes detrimental for others.

Despite the freezing cold during the visit, the consortium could observe several farmland bird species relevant for BirdWatch in their restored habitat and learn about the impact of fractalized habitats on the suitability of farmland for the black-tailed godwit.

<sup>1</sup> [https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/new-cap-2023-27/key-policy-objectives-new-cap\\_en](https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/new-cap-2023-27/key-policy-objectives-new-cap_en) (accessed on the 1st of March, 2023)



## Agenda

| Opening and Project Overview |                                                                                                     |                                                |
|------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------|
| 08:30 – 09:20                | Morning Coffee                                                                                      |                                                |
| 09:20 – 10:25                | Setting the Stage                                                                                   |                                                |
| 09:20 – 09:30                | Official Opening                                                                                    | Coordinator, LUP                               |
| 09:30 – 10:05                | <i>Project Officer Presentation</i><br>Project Management and Finances                              | Chiara Solimini,<br>(EUSPA)<br>Project Officer |
| 10:05 – 10:25                | Project Overview                                                                                    | Coordinator, LUP                               |
| 10:25 – 10:40                | Coffee Break                                                                                        |                                                |
| Work Packages                |                                                                                                     |                                                |
| 10:40 – 13:00                | Presentation of the Work Packages                                                                   |                                                |
| 10:40 – 11:00                | WP 1 - Management                                                                                   | Coordinator, LUP                               |
| 11:00 – 11:20                | WP 2 - Features and Requirements                                                                    | LUP                                            |
| 11:20 – 11:40                | WP 3 - EO-DataCube and Farmland Features                                                            | SIN, EURAC                                     |
| 11:40 – 12:00                | WP 4 - Species Distribution Modelling                                                               | UP                                             |
| 12:00 – 12:20                | WP 5 - BirdWatch Optimisation Algorithm                                                             | VITO                                           |
| 12:20 – 12:40                | WP 6 - Service Development                                                                          | LUP                                            |
| 12:40 – 13:00                | WP 7 - Demonstration and User Uptake Evaluation                                                     | NPA, ADS                                       |
| 13:00 – 14:30                | LUNCH                                                                                               |                                                |
| Going Forward                |                                                                                                     |                                                |
| 14:30 – 16:50                | First Actions / First Steps                                                                         |                                                |
| 14:30 – 15:30                | Upcoming Actions, Deliverables & Milestones for 2023                                                | Coordinator, LUP                               |
| 15:30 – 15:50                | Coffee Break                                                                                        |                                                |
| 15:50 – 16:50                | Discussion of remaining items regarding Project Administration, Finances & the Consortium Agreement | Coordinator, LUP                               |
| 16:50 – 17:00                | Closing Remarks                                                                                     | Coordinator, LUP                               |



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## Attendees

The table below lists the participants at the Kick-Off Meeting.

| Name                 | Organisation | Participation |
|----------------------|--------------|---------------|
| Chiara Solimini (PO) | EUSPA        | Online        |
| Serena Bignami       |              | Online        |
| Annett Frick         | LUP          | On Site       |
| Sascha Gey           |              | On Site       |
| Nastasja Scholz      |              | On Site       |
| Nika Oman-Kadunc     | Sinergise    | On Site       |
| Nejc Vesel           |              | On Site       |
| Ruth Sonnenschein    | EURAC        | On Site       |
| Basil Tufail         |              | On Site       |
| Annelies De Meyer    | VITO         | On Site       |
| Ruben Guisson        |              | On Site       |
| Rik Hendrix          |              | On Site       |
| Ine Rosier           |              | On Site       |
| Tomas Orlickas       | NPA          | On Site       |
| Martynas Rimgaila    |              | On Site       |
| Liutauras Šimkus     |              | On Site       |
| Damaris Zurell       | UP           | Online        |
| Mindaugas Busila     | ADS          | Online        |
| Luc De Bruyn         | INBO         | On Site       |



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## Official Opening

### Motivation

The Kick-Off was officially opened with a short summary of the main motivation behind BirdWatch. This included a reference to the ongoing decline in farmland bird biodiversity as reported, e.g. by the Pan-European Common Bird Monitoring Service (PECBMS)<sup>2</sup>.

In essence, the timing for a project like BirdWatch is very good, as the awareness of the decline of biodiversity and its repercussions, including in regard to the impact of industrial agriculture, is increasing substantially. This is reflected in new EU-wide frameworks such as in the key objectives of the new Common Agricultural Policy for 2023 to 2027<sup>3</sup>, including the Farm to Fork Strategy<sup>4</sup>, as well as in the EU's Biodiversity Strategy for 2030<sup>5</sup>.

Importantly, the necessary tools for establishing new monitoring and decision-support frameworks are now accessible. This includes freely available satellite imagery which recurrently provide data at unprecedented spatio-temporal scales as well as the necessary hardware and software resources to manage and analyse large amounts of complex information at scale and within practical time frames and reasonable expenditures.

### Presentation of Project Officer, Ms. Chiara Solimini of EUSPA

Following the short introduction on BirdWatch's motivations, Chiara Solimini, PhD, Space Downstream Market Officer, Project Officer of BirdWatch, representing the EC and the call coordinator, the European Global Navigation Satellite Systems Agency (EUSPA), officially opened the Kick-Off Meeting.

She started with a note that BirdWatch is an innovative action, situated within a set of actions focussing on „*Copernicus and EGNSS applications fostering the European Green Deal*“. Aiming to reach a technological readiness level (TRL) of 9, by the end of the project. These innovative actions are expected to have commercial impact and a clear market uptake. Here, she also stressed the importance of the business plan, which is a compulsory element to be developed during the BirdWatch Project.

She gave the BirdWatch consortium an overview of the hierarchical structure of agencies backing the BirdWatch project (Fig. 3).

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<sup>2</sup> [https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy\\_en](https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en) (accessed on the 1st of March, 2023)

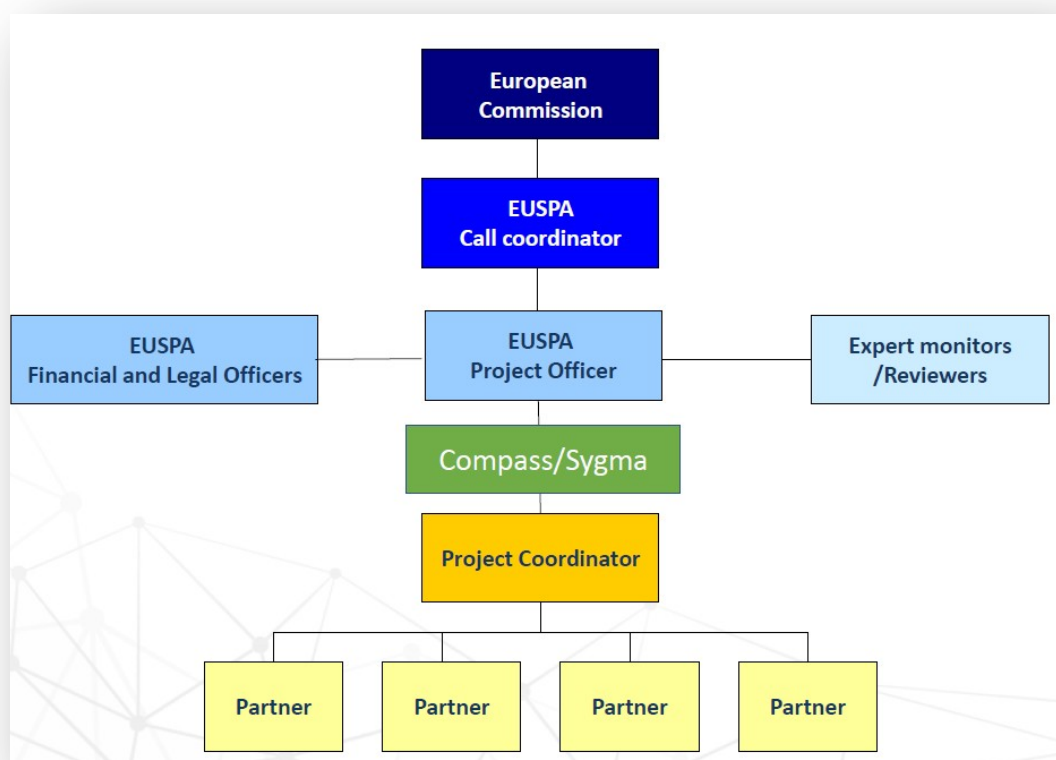
<sup>3</sup> <https://op.europa.eu/en/publication-detail/-/publication/c872a66c-9a96-11ea-9d2d-01aa75ed71a1> (accessed on the 1st of March, 2023)

<sup>4</sup> <https://www.euspa.europa.eu/newsroom/news/user-consultation-platform-helps-set-course-eu-space-programme> (access on the 1st of March, 2023)

<sup>5</sup> [myeuspacecompetition.eu](https://myeuspacecompetition.eu)



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**Fig. 3:** Roles in the BirdWatch Project; Source: Chiara Solimini, EUSPA

### *Reporting Modalities*

Among the roles visible in Fig. 3, she mentioned Compass / Sygma as the online tool through which BirdWatch reporting will take place.

Chiara Solimini provided an overview on the reporting requirements, including the continuous, periodic, midterm and final reports. Here, she referred to Annex I, in which the mandatory deliverables are listed. She stressed the importance of focussing on achievements when formulating the reports.

The continuous monitoring consists of quarterly reports (starting in M3 of the project), accompanying the whole project.

With the project's start on the 1st of February, 2023, the first phase of BirdWatch has begun, lasting until the 31st of August, 2024, after which the interim payment can be issued, based on the project's performance. The second phase, after which the final payment can be issued, ends on 31st of March, 2026. Both phases necessitate a midterm and final review, together with periodic reports and cost statements, respectively.

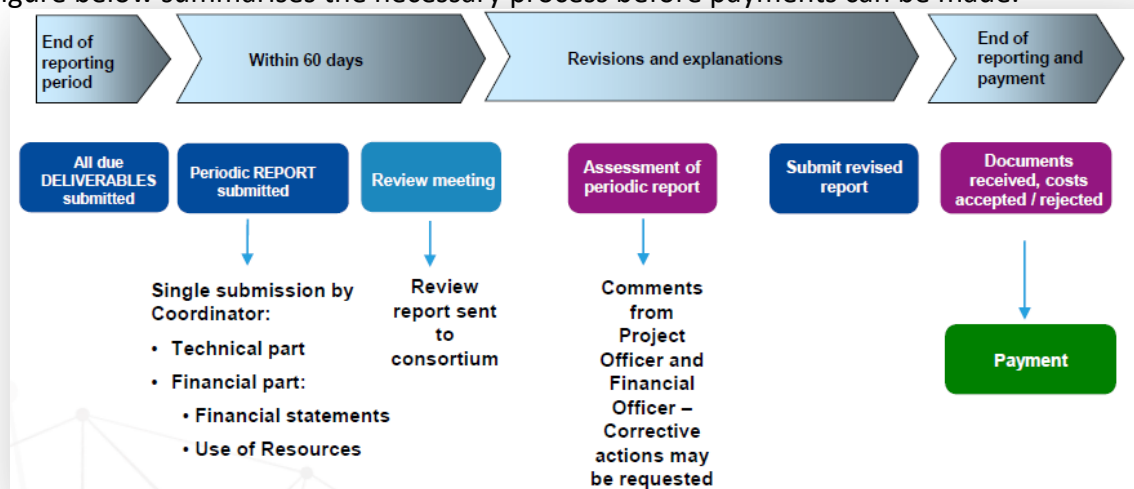
Periodic reporting is linked to the payments and consists of two parts, the technical and the financial parts. The former includes an explanation of the work carried out, an overview on the progress, a publishable summary and a questionnaire. The latter includes the individual financial



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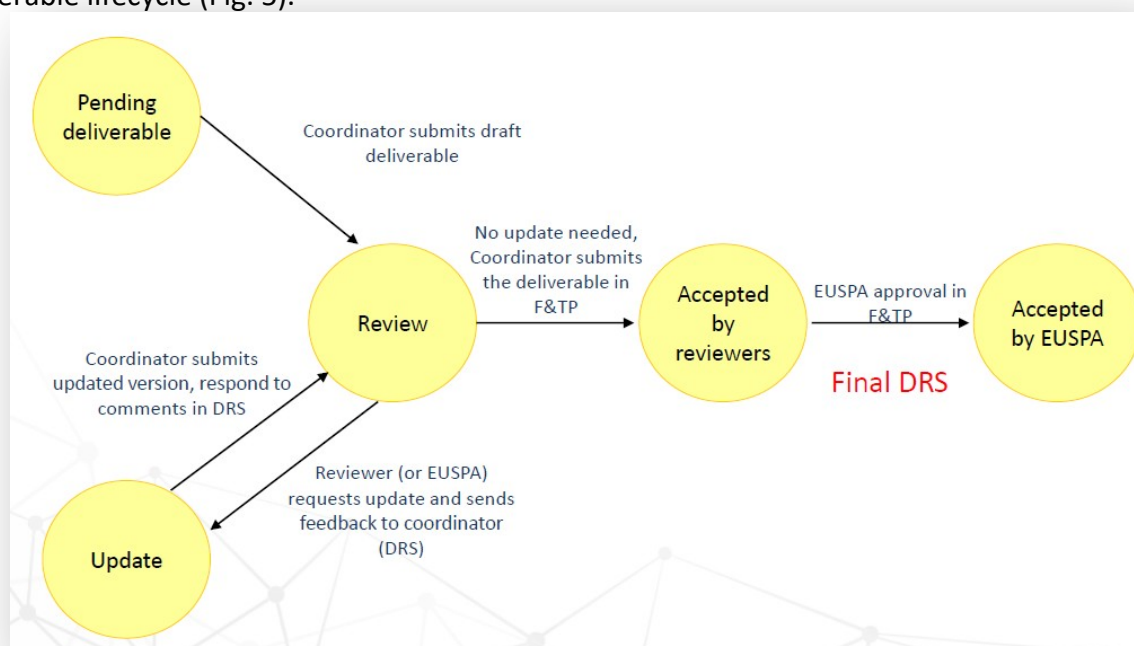
statements, an explanation of the use of the resources and a periodic summary of financial statements.

The figure below summarises the necessary process before payments can be made.



**Fig. 4:** Financial Reporting; Source: Chiara Solimini, EUSPA

Regarding the submission of deliverables, Chiara Solimini presented the workflow for the deliverable lifecycle (Fig. 5).



**Fig. 5:** Deliverable Lifecycle; Source: Chiara Solimini, EUSPA



In order for the Project Coordinator to submit a deliverable ready for review, Chiara Solimini asked to send it by email to her and the reviewers, latest one week before the due date. This will ensure the necessary time to evaluate the quality of the deliverables.

In general, deliverables must be approved by the reviewers using the Deliverable Review Sheet (DRS).

In case of milestones, deliverables and actions will be discussed between the Project Officer, the reviewers and the Project Coordinator, with minutes of meetings (MoM) taken by the Project Coordinator.

Status activity reporting, which is part of the quarterly reports of Work Package 1000, is a continuous process and changes, e.g., changed meeting dates, new deliverables, need to be reflected as soon as possible.

Status activity reporting includes the following elements:

- Status of deliverables
- Milestones
- Objectives
- Meetings
- Outcomes

Chiara Solimini described the following process, necessary for the quarterly reporting:

- The Coordinator completes the quarterly report and updates the status within two weeks at the end of every quarter.
- A half hour conference call is planned between at least the Project Coordinator, Project Officer and Project Reviewer two to three weeks after the report has been uploaded
- The conference call can be combined with a review meeting
- The call will focus on: key results, risks, opportunities, deliverables received in the quarter and next steps.
- The Project Reviewers complete his / her part within two weeks of the conference call. The Project Officer completes her part one week later.
- At this point the report is frozen for the quarter.

#### *Communication and Dissemination*

Chiara Solimini stressed the importance of the BirdWatch project for the definition of new pathways on European scale in the achievement of our sustainability goals. All beneficiaries are required to communicate and disseminate the project's outcomes and achievements. In case a planned communication or dissemination activity is expected to have a major impact, the beneficiaries must inform the granting authority.



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Adding to this, Chiara Solimini highlighted the support the EUSPA offers BirdWatch, in promoting the project and in the networking with important potential stakeholders and users. As an example, Chiara Solimini presented on the BirdWatch project during the KCEO Deep Dive on Biodiversity Stakeholder Workshop in November, 2022. There, the BirdWatch project could have relevance or a connection, e.g., to

- Monitoring the EU Biodiversity Strategy of 2030 progress towards the targets
- DG REGIO – Monitoring ecosystems health to support biodiversity investments
- DG ENV – Monitoring key habitats for biodiversity with a focus on wetlands
- DG ENV – Monitoring of Urban Green Spaces
- DG CLIMA – Regular assessment and monitoring of EU forests health conditions

Additionally, she announced the opportunity for the BirdWatch consortium to join the upcoming event of the European User Consultation Platform (UCP), likely to take place in the fourth quarter of 2023. The next issue of these events focuses specifically on sustainable agriculture and environmental issues. Chiara Solimini shortly referred to last year's event<sup>6</sup> of the UCP to highlight the benefits of such a gathering.

Finally, she also mentioned upcoming opportunities to win prizes, such as the CASSINI Maritime Prize, the new myEUspace competition, for which participants can apply with a product ready to be scaled up (deadline April 2023)<sup>7</sup>. Solutions should have relevance to the innovation areas „Space my Life“, „My Green Planet“ or „Dive in Deep Tech“.

Chiara Solimini also listed several upcoming EUSPA Horizon Europe calls, prominently the calls on „Copernicus-based applications for businesses and policy-making“ and on „Designing space-based downstream applications with international partners“. The latter two calls have deadlines in February 2024 and thus might provide good further funding opportunities for the BirdWatch consortium.

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<sup>6</sup> <https://cordis.europa.eu/project/id/101081964> (accessed on the 1st of March, 2023)

<sup>7</sup> <https://www.dda-web.de/>



## Overview of the BirdWatch project

The first part of the Kick-Off Meeting continued with a short overview of the BirdWatch project. The Project Coordinator, Nastasja Scholz, from LUP, summarised the overarching goals, i.e., to

- Improve the farmland bird habitat suitability and thereby farmland biodiversity
- Support sustainable agricultural practices and their monitoring
- Support the compliance with international, national and regional guidelines, including the EU's Common Agricultural Policy
- Support and set new standards in the improvement and preservation of the health of the farmland ecosystems,  
as well the main project goals:
  - Combine species distribution modelling with EO data-based geospatial feature maps to quantify the habitat suitability of agricultural land for farmland birds
  - Optimise for both bird species and stakeholder requirements to identify the appropriate greening measures
- Provide various stakeholders with a decision support system consisting of monitoring & optimisation services accessible via a web-based application

She listed BirdWatch's potential stakeholders and users:

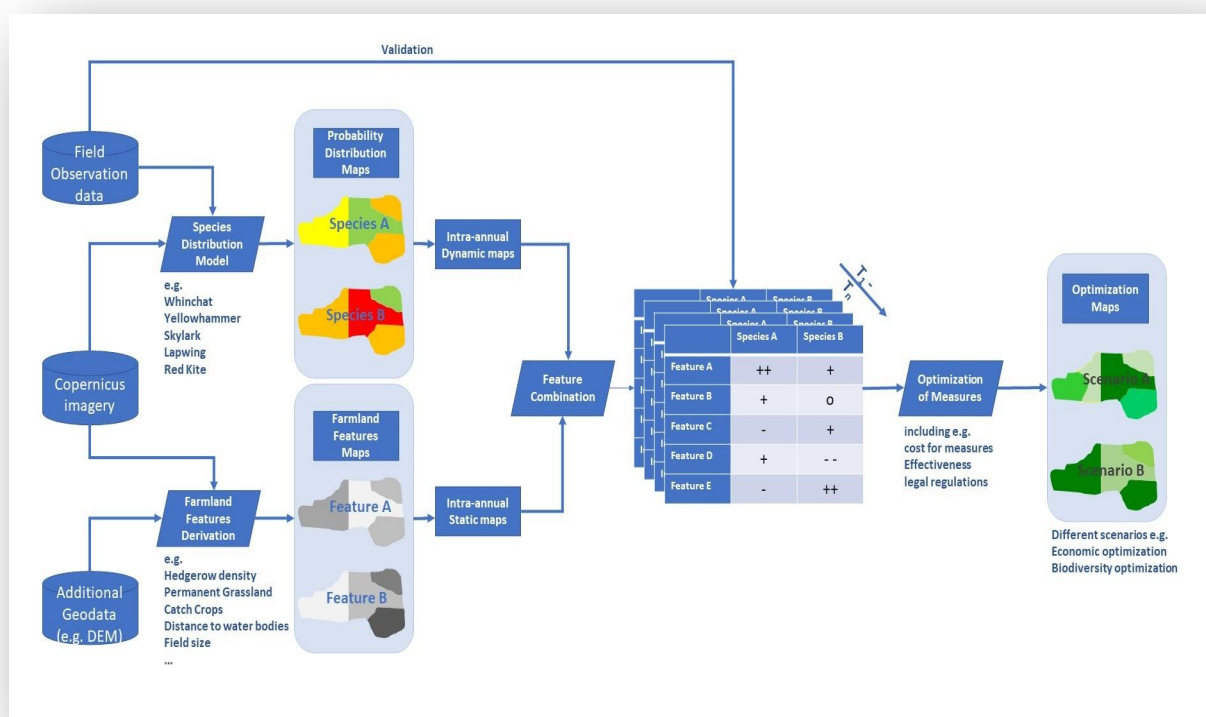
- Farmland birds
- Farmers and farming organisations
- Administrative bodies, in charge of oversight, such as national paying agencies
- Policy-makers
- NGOs
- Ornithologists, ornithological associations, research & academia
- The concerned public

She mentioned BirdWatch's focus on bird species included in the Farmland Bird Index, an established indicator, used in the various bird monitoring schemes on national and EU levels, and presented a selection of target bird species to focus on during BirdWatch.

She then listed the topics which will need to be addressed during the project's lifetime, summarised in Fig. 6.



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**Fig. 6:** Overview of the workflow behind the BirdWatch service

This includes relevant aspects, e.g.:

- Data collection, harmonisation, integration
- Data privacy, security and ownership
- Selection of geospatial features important for habitat description
- Selection of geospatial features important for stakeholders
- The connection of EO-features with species distribution modelling and its various forms
- The integration of the existing capabilities of Sinergise' Sentinelhub
- The integration of the existing capabilities of VITO's MooV service
- The planning and carrying out of validation activities on various levels of the service development
- UI / UX considerations
- The collection and implementation of user feedback
- The establishment of a BirdWatch features database
- The selection of the relevant features for the optimisation workflow
- Potential regional differences in the importance of features
- The integration of links to the guiding policies farmers need to observe, including the eco-schemes
- Customer type-dependent access to the service
- Business / exploitation plan
- Communication and dissemination activities



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As an example for the communication and dissemination activities, Nastasja Scholz mentioned the recent connection made to team members of the new Horizon project BioMonitoring4CAP<sup>8</sup>. BioMonitoring4CAP aims to combine classical indicator systems that are part of the European monitoring framework with various indicator systems mostly recently developed and applied in form of standalone systems: i) new indicator species, ii) genetic diversity, iii) on-site sensors, iv) functional diversity, and iv) various spatial measures.

Network members like these can be essential for BirdWatch, as they might accelerate the dissemination of the BirdWatch service, once it has been established.

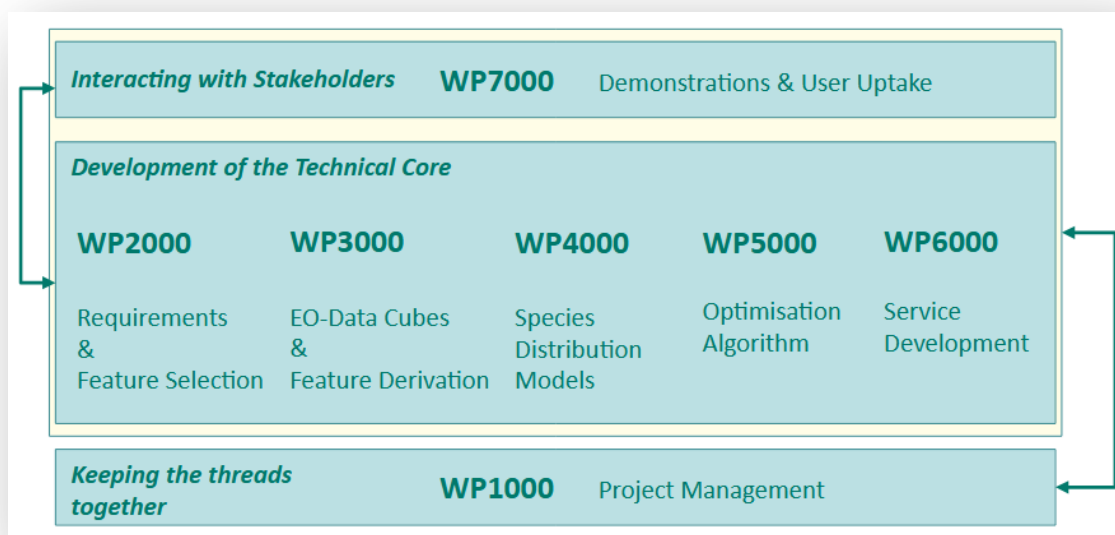
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<sup>8</sup> <http://www.ipgs.it/>



## Work Packages

The following figure summarises the work packages (WP) involved in BirdWatch.



**Fig. 7:** BirdWatch Work Package Overview

In the following, the WP plans were introduced by the following representatives of the beneficiaries:

|         |                                                       |
|---------|-------------------------------------------------------|
| WP 1000 | Nastasja Scholz – LUP                                 |
| WP 2000 | Sascha Gey – LUP                                      |
| WP 3000 | Nika Oman-Kadunc and Basil Tufail - Sinergise & EURAC |
| WP 4000 | Damaris Zurell – UP                                   |
| WP 5000 | Annelies De Meyer – VITO                              |
| WP 6000 | Annett Frick – LUP                                    |
| WP 7000 | Tomas Orlickas - NPA                                  |



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## **WP1000 – Project Management**

This WP accompanies and guides the BirdWatch project throughout the next three years. The leading beneficiary of this WP is the LUP.

It has five sub work packages, dealing with the various relevant management aspects of the project.

The following presents a short overview of the five sub-WPs.

## **WP1100 – Administrative, Legal and Financial Coordination**

Main goals of this sub-WP is contract management, and the monitoring implementation of the consortium agreement (CA). In WP1100 aspects regarding the intellectual property rights are managed and the project financial management is organised and documented, to ensure monitoring of the cost performances and proper use of resources.

## **WP1200 – Project Steering**

Main element of the sub-WP is the Steering Committee, consisting of representatives of the beneficiaries. The committee oversees the definition of the project tasks, quality and risk management and the establishment and compliance with project guidelines. This includes the definition of indicators to assess the achievement of project goals within the foreseen time frame. The guidelines will be framed in the form of a Project Management and Quality Handbook, to be updated throughout the project as deemed necessary. This will also include the Data and Risk Management Plans.

## **WP1300 – Project Dissemination and Communication**

Communication and dissemination activities will be paramount within the BirdWatch project. This also includes setting up and following an internal communication structure. In the course of the project communication and dissemination plans will be formalised, guiding the stakeholder engagement and how to raise awareness of the project's achievements. Databases will be maintained regarding the project network, the interaction with stakeholders, emerging communication and dissemination opportunities and the contacts within the institutions of the individual beneficiaries.

## **WP1400 – Project Exploitation**

The business plan will be an essential output of the project and therefore has its own sub-WP. Throughout BirdWatch, the business plan will be devised and updated when necessary, while monitoring any emerging opportunities for project exploitation.

## **WP1500 – Project Reporting**

As highlighted by the Project Officer, Chiara Solimini, reporting activities will be essential throughout the project's lifetime and outputs will be necessary on a frequent basis. This sub-WP is dedicated to the reporting activities, with a focus on the achievements of the individuals WPs.



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## WP1600 – Subcontractor Management

Additional to the beneficiaries of BirdWatch, the project also has two subcontractors, the Bioland e.V. in Germany and the Instituut voor Natuur- en Bosonderzoek (INBO). Management of the subcontracts also falls under the responsibility of WP 1600.

## WP2000 – Requirements and Features

This WP is predominantly concerned with the derivation of software, stakeholder and user requirements and the selection of the essential EO-based features to be developed. Thus, it forms the basis for the service development process for the coming three years.

The goal of this WP can be summarised with the following items:

- Choice of bird species to be involved
- Selecting species requirements indices which describe habitat suitability
- Selecting the EO data for WP3000 (data-cubing)
- Determining service platform data and system requirements
- EO data as indicators for habitat suitability modelling
- Stakeholder requirements and constraints habitat requirements and eco-schemes

## WP2100 – Target Bird Species and their Requirements

A central input for the BirdWatch service are the bird species, together with their individual habitat requirements, for which we will monitor and improve the habitat suitability.

The following selection criteria are used:

- The bird species should be part of the established European farmland bird indicator (FBI) to assess the biodiversity state of the agricultural landscape.
- They should occur in all or some of the four test regions (Flanders, Germany, Lithuania and South Tyrol)
- They should cover a variety of EO-measurable habitat requirements, e.g., open vs. closed habitats, homogeneous vs. heterogeneous habitats, preferences for wet vs. dry soil conditions, sparse vs. dense vegetation, far vs. close to settlements, preferences for grassland vs. arable land
- There must be observation data available regarding the habitats of the chosen bird species

Sascha Gey shortly introduced the workflow used to collect bird observation data in Germany and how this data serves as valuable training data for BirdWatch. The main advantages are that bird monitoring data, as collected by, e.g., the Common Breeding Birds Survey in Belgium<sup>9</sup>, the German Dachverband Deutscher Avifaunisten<sup>10</sup> (DDA), the Lithuanian Common Bird Monitoring scheme<sup>11</sup>,

<sup>9</sup> <http://www.aves.be/> / <https://www.inbo.be/nl/natuurindicatoren>

<sup>10</sup> <https://mito2000.it>

<sup>11</sup> <http://birdwatch.lup-umwelt.de/>



and the Monitoraggio Italiano Ornitologico<sup>12</sup>, include exact point locations of breeding ground and are validated by experts.

### WP2200 – Definition of Stakeholder Requirements

In this sub-WP, stakeholder requirements will be defined, first for Flanders and Germany, followed by Lithuania and South Tyrol. As in the case of the habitat requirements, these are paramount as an input for the software development roadmap.

Regarding farmers and farming organisations, stakeholder requirements include constraints on crop type transition, on mowing periods, or on the budget and profit-loss ratios.

Important criteria for the selection of the requirements are that they support pathways to evaluate and determine the most effective eco-schemes for bird habitats, that they can be integrated into monitoring concepts and allow for the control of success.

### WP2300 – Definition of Platform Requirements

This sub-WP concerns the user and system requirements to be considered in the development of front- and back-end. This includes considerations regarding the interfaces between the different services within BirdWatch (i.e., the derivation of EO-based features, species distribution models, optimisation service) as well as between the BirdWatch service and the users, including UX- and UI-considerations but also stakeholder-dependent differences in data / service access.



**Fig. 8:** Selection of examples of which parcel-based information could be shown to the user or stakeholder, colour-coded based on the parcel-based parameter values

<sup>12</sup> Zurell, D., Franklin, J., König, C., Bouchet, P.J., Dormann, C.F., Elith, J., Fandos, G., Feng, X., Guillera-Arroita, G., Guisan, A., Lahoz-Monfort, J.J., Leitão, P.J., Park, D.S., Peterson, A.T., Rapacciuolo, G., Schmatz, D.R., Schröder, B., Serra-Diaz, J.M., Thuiller, W., Yates, K.L., Zimmermann, N.E. and Merow, C. (2020), A standard protocol for reporting species distribution models. *Ecography*, 43: 1261-1277. <https://doi.org/10.1111/ecog.04960>

## WP2400 – Preparation of Farmland Property Maps

With a strong link to the developments of WP3000, EO-based farmland feature maps will become available via the platform. The front-end will thus allow access to differently themed features. Farmland property maps, which will be made available, include - apart from the habitat suitability per bird species - vegetation health, crop types, texture-based parameters, and structural elements (Fig.9 below).

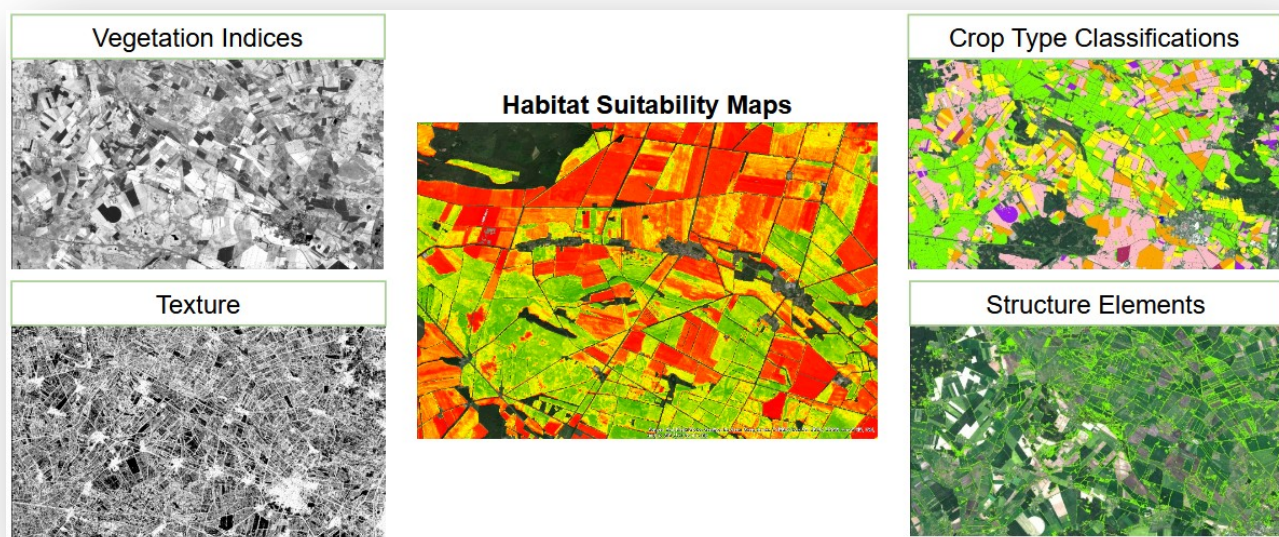


Fig. 9: Examples of different farmland feature maps to be developed

## WP3000 EO-DataCubing and farmland features

This WP serves the access and preparation of relevant data as per requirements defined by WP2000. Its goal is satellite imagery exploration and the definition of the appropriate data preparation in order to serve as an input to the species distribution modelling. Multi-sensor satellite imagery will be made accessible for the creation of EO-data cubes relevant for the assessment of species requirements indices which describe habitat suitability.

Summary of the goals of WP3000:

- Preparation of geospatial datasets
- Exploration and preparation of optical data cubes and biophysical indicators
- Exploration of SAR data, texture measures and soil moisture
- Farmland area mapping

## WP3100 - Acquisition of geospatial datasets

This sub-WP deals with the acquisition, exploration and preparation of geospatial datasets relevant to obtaining the EO-features that describe the habitat suitability for the respective bird species. The sub-WP 3100 includes:



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- Acquisition of geospatial datasets
- Formation of a standardised reference geospatial database to support other WPs.
- Comprising regional and national data provided by stakeholder and project partners including freely available data.

Basil Tufail from Eurac Research presented previous work on geospatial datasets and examples of datasets that could be made available for the purpose of extracting indicators for habitat suitability. Depending on the requirements defined in WP2000, these could include:

- Crop types (Land Parcel Information Service)
- Land Cover
- Elevation
- Infrastructure
- Hydrology

Desired databases could be shared as an API or using a sFTP. Important to get insight on data availability from different partners specific to their regions including metadata.

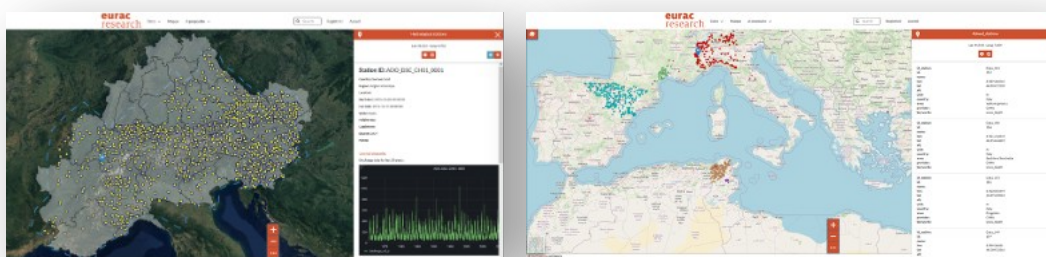


Fig. 10: Examples of hydrology datasets.

### WP3200 – Optical data cubing and biophysical indicators

The purpose of this sub-WP is to provide access to optical EO data and derived data products to support activities in WP2400 and WP4000 and to serve as input for WP3400. Optical satellite data can be made available through Sentinel Hub cloud API provided by Sinergise. The collections of available data include a wide range of different sensors from different satellite missions with historical and current data, accessible through SentinelHub APIs.

Nika Oman Kadunc from Sinergise presented the functionality of Sentinel Hub together with availability of satellite and other data collections and accessibility of the data. Also examples of previous work on the derivation of biophysical indicators from raw satellite data was presented.



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## sentinelhub a cloud-based data API



Fig. 11: Data collections available through SentinelHub cloud API.

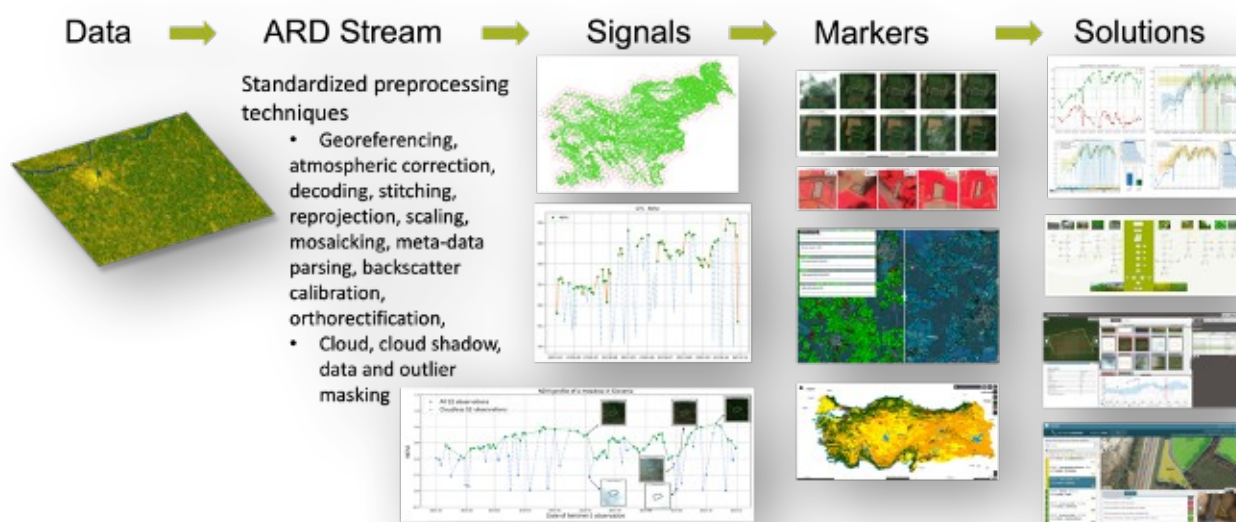


Fig. 12: Deriving indicators and solutions from raw satellite data.

## WP3300 – SAR data, texture measures and soil moisture

The purpose of this sub-work package is to compute SAR data and derived products, including preprocessing of S1 data which is orthorectification, radiometric and geometric correction and speckle filtering in most cases. After this analysis, ready S1 backscatter and coherence time series can be provided. Based on the relevance and importance for other WP, products like soil moisture and texture features can be derived from the SAR backscatter.

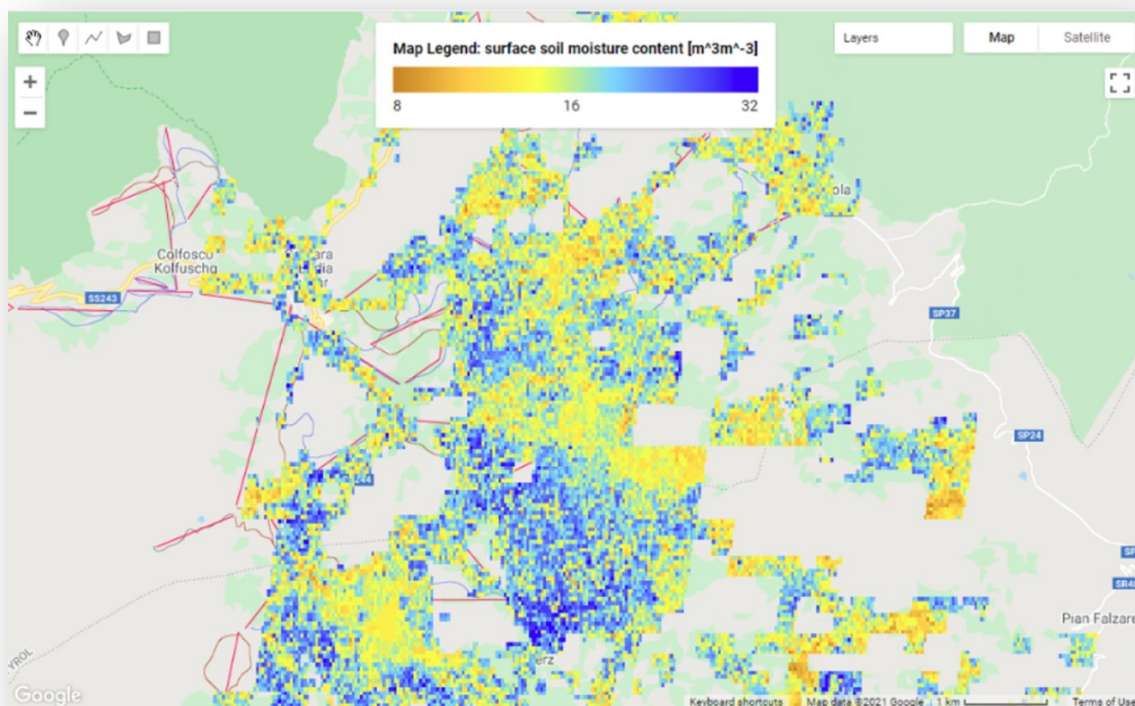


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Basil Tufail from Eurac presented the pre-processing workflow for Sentinel-1 data to extract dual pole (VV and VH) backscatter intensity data and dual-pol (VV and VH) 6-day interferometric coherence generated from phase information.

Other useful products were presented as well. Texture features like contrast, correlation, dissimilarity, entropy, and homogeneity can be derived from SAR data after computing the Gray Level Co-occurrence Matrix (GLCM). Another important SAR-derived product is soil moisture, an already developed processing chain is deployed on GEE. It requires a lot more other sources of data such as Landsat thermal data, MODIS evapotranspiration and land cover etc. The model for this is trained using the in situ measurements from International Soil Moisture Network (ISMN).

The following figure shows an example of a derived soil moisture map.



**Fig. 13:** Soil moisture map, derived from a combination of SAR, Landsat and MODIS data

### WP3400 - Farmland area mapping

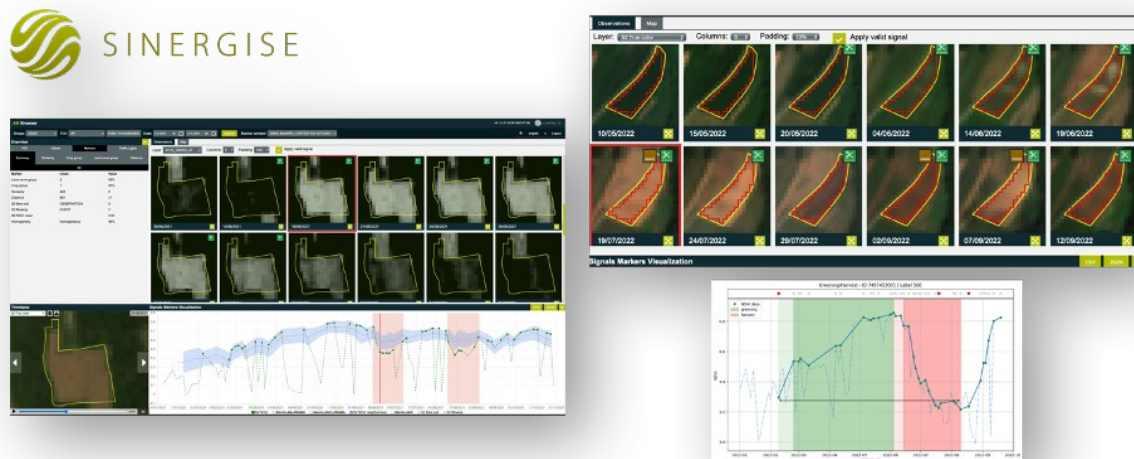
According to the requirements of WP2000, farmland maps with relevant farmland features will be created. This may include mapping of spatial distribution of agricultural features such as cropland and grassland or crop type classification mapping. The farmland features may also include the use of signals and markers to describe agricultural activity such as mowing and harvest or natural and semi-natural structures. The algorithms to detect the relevant features will also be validated.

Nika Oman Kadunc presented the markers developed at Sinergise to detect agricultural events such as mowing, harvest and greening and crop classification model.



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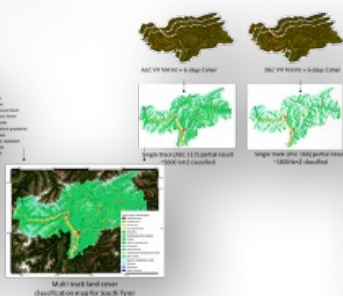
Eurac Research presented their experience and previous work on creation and validation of land cover maps, grassland mowing detection and vegetation mapping.



**Fig.14:** Examples of markers for detecting agricultural activity.

### Land cover classification

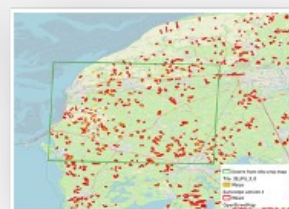
- EO-based mapping using different
  - data sources
  - classification systems



### Crop type map validation

- Validation of European crop type generated by Vito.
- Collection of external crop mapping resources like Euro Crops JRC and LPIS.
- Aggregation and Harmonization of crops from various sources.

| Case                                                       | Significance of the Intervention for Long-term Health Status |             |            |         |                           |              |                         |                       |                      |              |
|------------------------------------------------------------|--------------------------------------------------------------|-------------|------------|---------|---------------------------|--------------|-------------------------|-----------------------|----------------------|--------------|
|                                                            | Adverse                                                      | Behavioral  | Medical    | Mental  | Functional                | Health       | Quality of Life         | Healthcare Costs      | Productivity         | Health       |
| Case 1: Patient with chronic pain and opioid use disorder  | Chronic pain                                                 | Alcohol use | Depression | Anxiety | Reduced work productivity | Chronic pain | Reduced quality of life | High healthcare costs | Reduced productivity | Chronic pain |
| Case 2: Patient with chronic pain and opioid use disorder  | Chronic pain                                                 | Alcohol use | Depression | Anxiety | Reduced work productivity | Chronic pain | Reduced quality of life | High healthcare costs | Reduced productivity | Chronic pain |
| Case 3: Patient with chronic pain and opioid use disorder  | Chronic pain                                                 | Alcohol use | Depression | Anxiety | Reduced work productivity | Chronic pain | Reduced quality of life | High healthcare costs | Reduced productivity | Chronic pain |
| Case 4: Patient with chronic pain and opioid use disorder  | Chronic pain                                                 | Alcohol use | Depression | Anxiety | Reduced work productivity | Chronic pain | Reduced quality of life | High healthcare costs | Reduced productivity | Chronic pain |
| Case 5: Patient with chronic pain and opioid use disorder  | Chronic pain                                                 | Alcohol use | Depression | Anxiety | Reduced work productivity | Chronic pain | Reduced quality of life | High healthcare costs | Reduced productivity | Chronic pain |
| Case 6: Patient with chronic pain and opioid use disorder  | Chronic pain                                                 | Alcohol use | Depression | Anxiety | Reduced work productivity | Chronic pain | Reduced quality of life | High healthcare costs | Reduced productivity | Chronic pain |
| Case 7: Patient with chronic pain and opioid use disorder  | Chronic pain                                                 | Alcohol use | Depression | Anxiety | Reduced work productivity | Chronic pain | Reduced quality of life | High healthcare costs | Reduced productivity | Chronic pain |
| Case 8: Patient with chronic pain and opioid use disorder  | Chronic pain                                                 | Alcohol use | Depression | Anxiety | Reduced work productivity | Chronic pain | Reduced quality of life | High healthcare costs | Reduced productivity | Chronic pain |
| Case 9: Patient with chronic pain and opioid use disorder  | Chronic pain                                                 | Alcohol use | Depression | Anxiety | Reduced work productivity | Chronic pain | Reduced quality of life | High healthcare costs | Reduced productivity | Chronic pain |
| Case 10: Patient with chronic pain and opioid use disorder | Chronic pain                                                 | Alcohol use | Depression | Anxiety | Reduced work productivity | Chronic pain | Reduced quality of life | High healthcare costs | Reduced productivity | Chronic pain |

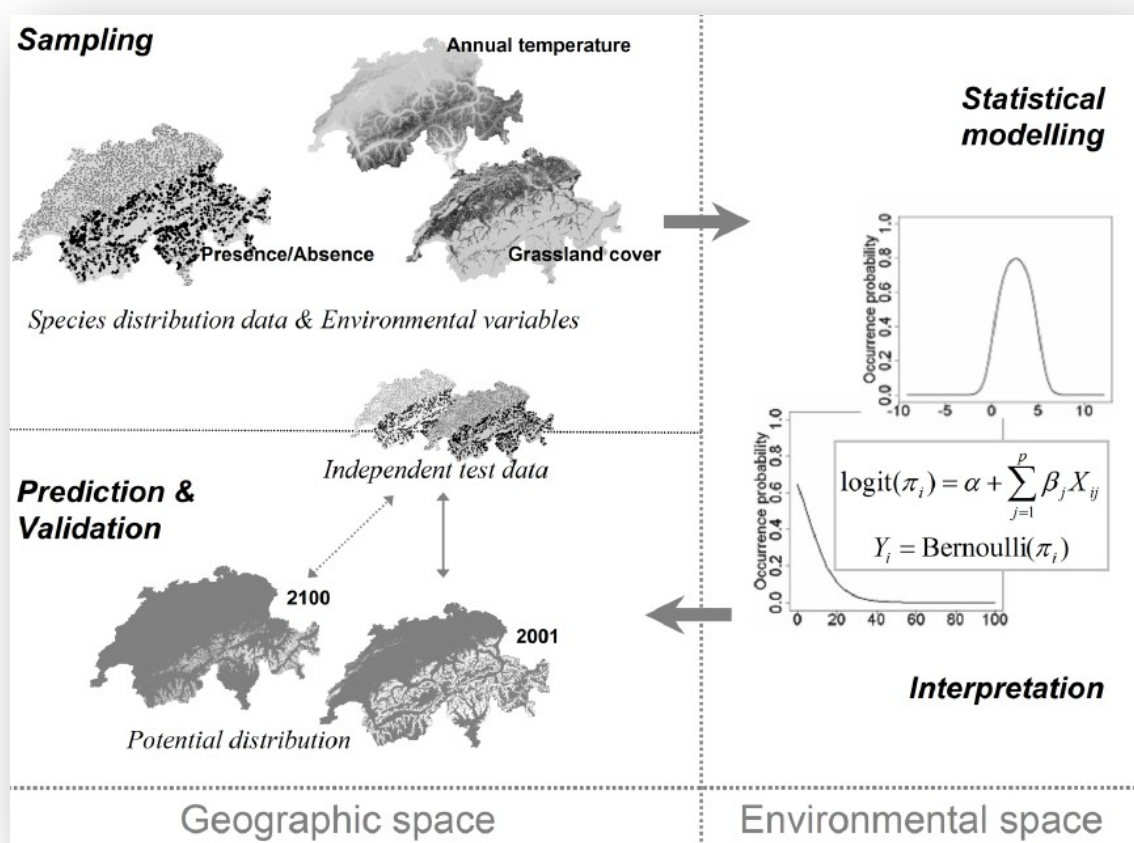


**Fig. 15:** Example of Land cover mapping and validation of crop type map.



## WP4000 – Species Distribution Modelling

Main goals of the WP on species distribution modelling (SDM) is the assessment of the determinants of spatial and temporal occurrence of farmland birds in the different test regions and across different spatial scales as well as the production of species-environmental relationships as input for optimising habitat suitability in WP5000. Correlative SDMs will link geographic features, species observation data and environmental parameters to establish probability distributions of the potential occurrence of a species (Fig. 16).



**Fig. 16:** Schematic workflow for the generation of correlative species distribution models

To do this, the UP is implementing the newest standards for decision-making, themselves establishing new standards, e.g., for the reporting of SDMs<sup>13</sup>.

In WP4000, the focus lies on the use of regression-based techniques and machine-learning algorithms, using presence and absence (or background) data to contrast used and unused sites. Among the regression-based techniques, several approaches can be used:

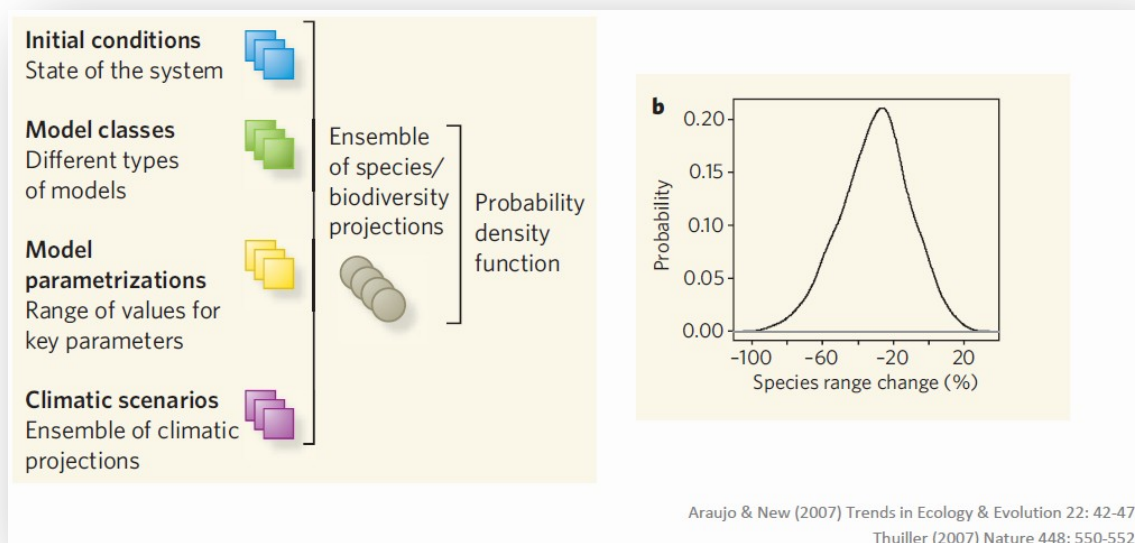
<sup>13</sup> <https://gustaafklimt.be/>





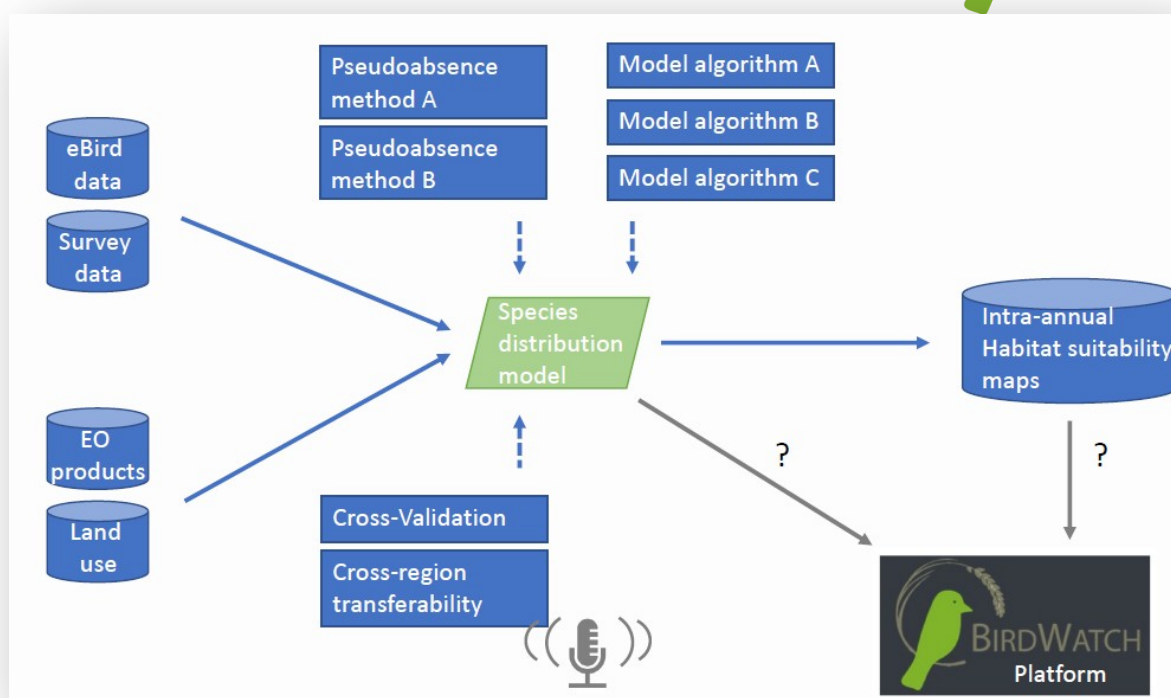
- Regression: e.g. generalised linear model (GLM), generalised additive model (GAM), multivariate adaptive regression splines (MARS), etc.
- Machine-learning: e.g. classification and regression tree (CART), artificial neural network (ANN), generalised boosted model/boosted regression trees (GBM/BRT), random forest (RF), maximum entropy (Maxent), genetic algorithms, etc.

As these algorithms react very differently to environmental parameters, ensemble algorithms will be used in BirdWatch. These are based on generating multiple simulations across more than one set of initial conditions (data), model classes, model parameterisations, and boundary conditions (scenarios), as visualised in Fig. 17.



**Fig. 17:** Schematic workflow for the generation of ensemble species distribution models

A summary of the approach used specifically for BirdWatch is depicted in Fig. 18, with different steps being the focus of the individual sub-WPs of WP4000.



**Fig. 18:** Schematic workflow for the generation of ensemble species distribution models

### WP 4100 - Species data consolidation & model workflows

For BirdWatch, Citizen science, eBird, and GBIF data will be used as input. Further data sources might be added if seen fit. To overcome the difficulties due to missing absence data, pseudo-absence methods will be tested to establish different model algorithms, cross-validating them, e.g., with audio data. Spatial resolutions will be aggregated to average home range sizes of different farmland birds. In addition, data from standardised surveys of local authorities will be consolidated. These data usually have a coarse resolution of more than 1 km, but provide somewhat reliable estimates of species absences and can thus be used for model validation.

### WP 4200 - Ensemble models - Flanders

Pipelines for ensemble SDMs and joint SDMs will be set up. Joint SDMs allow for the modelling of more than one species at a time. This approach is particularly suited if rare species are included in the analyses where the models can borrow strength from the more common species. Within-region model performance will be assessed using resampling approaches. Initially, models will use EO data and indices as predictor variables, and in a second step models will be trained with land use classification data as they become available from WP3000. This sub-WP will focus on the test region of Flanders, in order to set up the necessary workflows to be employed to the other regions at later steps.



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### **WP 4300 - Ensemble models - all regions**

This sub-WP will mainly focus on the extension of the ensemble and joint SDMs developed in WP4200 to the remaining test regions (Germany, Lithuania, South Tyrol). This will be accompanied by rigorous model performance testing.

### **WP 4400 - Model transferability**

Cross-region transferability of both the ensemble and joint SDMs will be validated. This will be assessed in terms of their predictive ability at different spatial scales. This will include the consideration of the spatial resolution of the training data to assess model ability to reliably predict species presences as well as coarser spatial resolutions of the standardised surveys to assess model ability to reliably predict species absences based on land-use configurations. For areas in the study regions where fine-scale presence and absence data are particularly sparse but the species distribution models indicate high suitability for specific farmland birds, audio detectors will be installed to monitor species presence in the early breeding months (when they are very active vocally). Automatic sound classification based on machine-learning algorithms will help identify the presence of farmland birds and serve as validation of the habitat suitability predictions.

Based on the multi-scale transferability results, decisions on the best approach to make predictions of habitat suitability for the different farmland birds across entire Europe will be made, to adequately account for potentially varying habitat associations across regions.

### **WP5000 – BirdWatch Optimisation Algorithm**

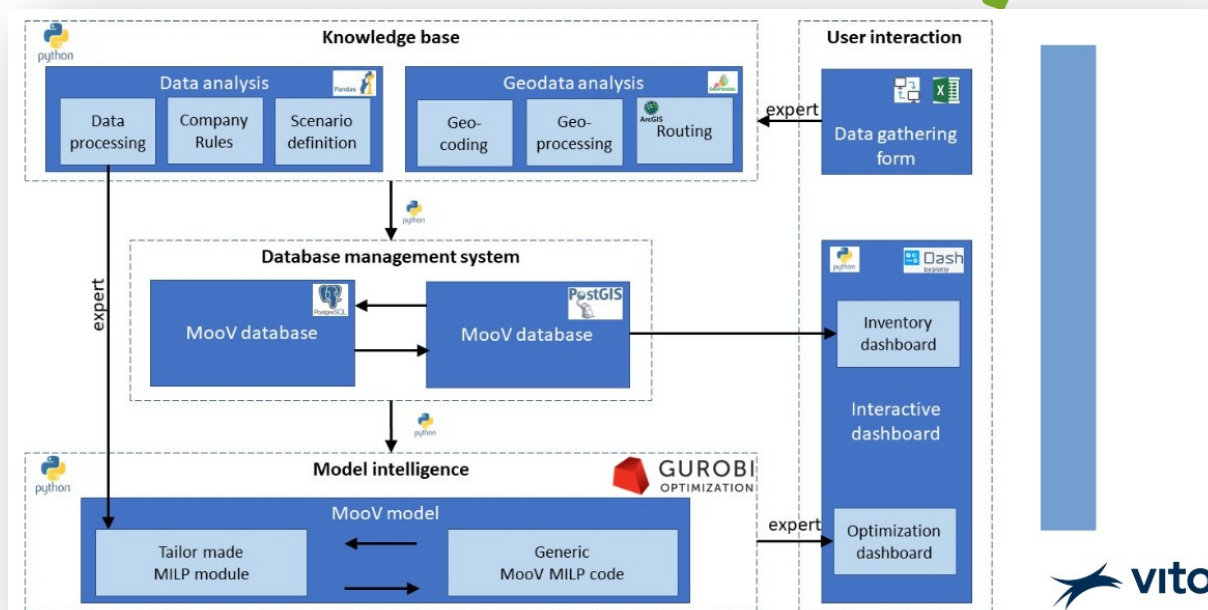
Main objective of WP5000 is the optimisation of farmland bird habitat suitability at minimum cost while maximising bird populations. In the course of the project's lifetime, the MooV supply chain optimisation algorithm will be adapted in order to be applicable within the BirdWatch service.

### **WP 5100 - Development of the BirdWatch Optimisation Algorithm**

Among the key decision parameters implemented, are cost-benefits (e.g., trade-offs, sensitivities), storage and processing (e.g., capacities, physical locations), quality aspects (e.g., specifications for the products in question), and time-effects (e.g., supply and demand). The following figure shows how MooV will be adapted to operate within BirdWatch.



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**Fig. 19:** The MooV service as it is foreseen to be adapted to operate within BirdWatch

The resulting optimisation will be made visible to the users, e.g., in the form of dashboards, allowing them to see the impact of their planned decisions on the habitat suitability of their land but also on their budget and other constraints.

To enable this, VITO will set up two objective functions to be optimised:

- (1) one to maximise the occurrence of farmland bird species in the region
- (2) and another to minimise the total cost for changing habitat suitability

Input for WP5100 will be the derived constraints of the features and requirements analyses (WP2000), the EO-data classification (WP3000 ) and habitat parameters derived via SDM (WP4000).



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## WP 5200 - Proof-of-Concept by Implementation and Validation

The proof-of-concept will be based on the testing and validation of the BirdWatch optimisation algorithm in all four test regions, i.e., in Flanders, Germany, Lithuania and South Tyrol.

Once validated, the BirdWatch optimisation algorithm will deliver maps with the optimal land use patterns for the specific scenarios, as well as graphs comparing different scenarios and trade-offs between the different objective functions. These results are ready to be implemented into the BirdWatch platform (WP6000) and further testing together with stakeholders (WP7000) for evaluation and discussion.

## WP6000 – Service Development

The WP leader is the LUP and the main objectives are the development, testing and dissemination of the web-service platform, so as to enable users to access bird habitat suitability maps, a corresponding monitoring service and to identify tailored and optimised eco-schemes for farmland areas. The integration of the algorithms and the database for multi-temporal, multi-modal data developed in WPs 2000-5000 is crucial for this WP.

It has three sub work packages, dealing with the various relevant aspects of the service development.

The image below represents the starting point of the platform to be developed. It is the result of a master thesis, written by Sascha Gey in collaboration with the LUP.



Fig. 20: The BirdWatch platform as it is currently available via web-app for the state of Brandenburg, in Germany<sup>14</sup>

<sup>14</sup> <https://de.sendinblue.com/>



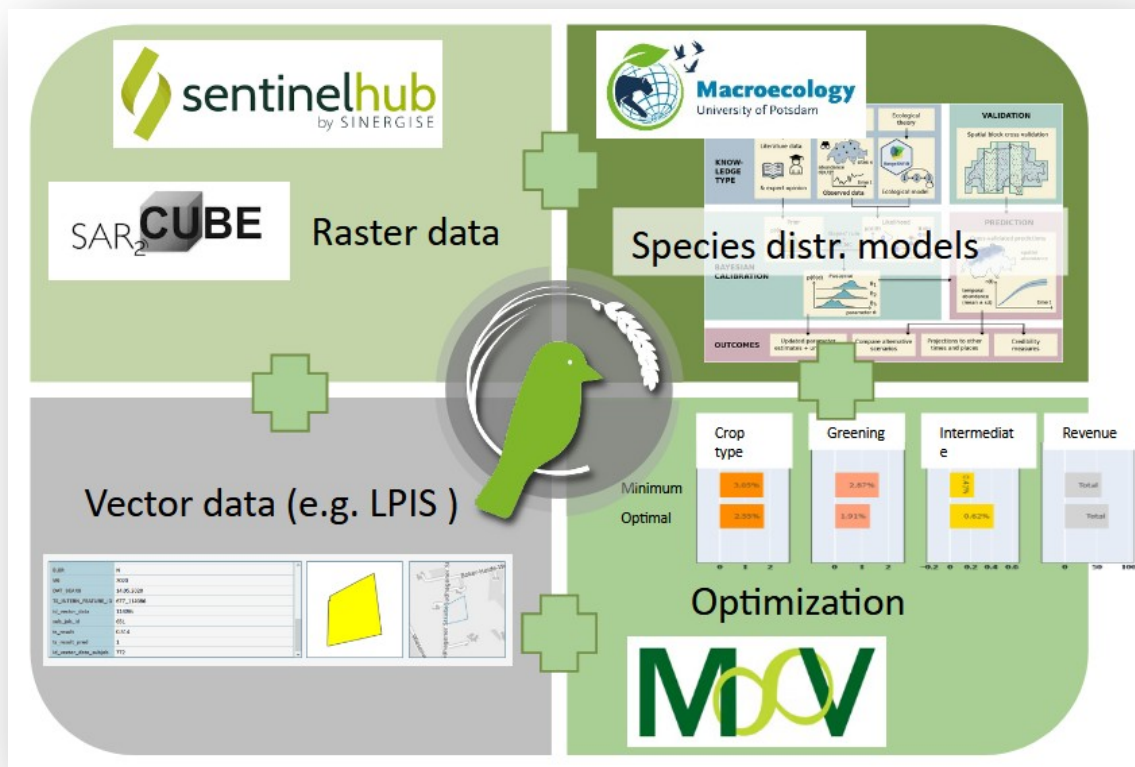
## WP 6100 - BirdWatch backend database development

The main tasks of this sub-WP are the

- Development of a relational database for the back-end of the BirdWatch service
- Definition of data model (e.g., the combination of tables, views, indexes)
- Population with the data necessary for the implementation of BirdWatch
- Connecting suitability maps to the respective parcel information

The data sources to be integrated include

- EO based features (e.g. crop type, mowing, landscape structure)
- Bird data (field observation)
- Parcel boundaries (Land Parcel Identification System - LPIS)
- Species distribution models (including scenarios)



**Fig. 21:** The different components of the BirdWatch platform

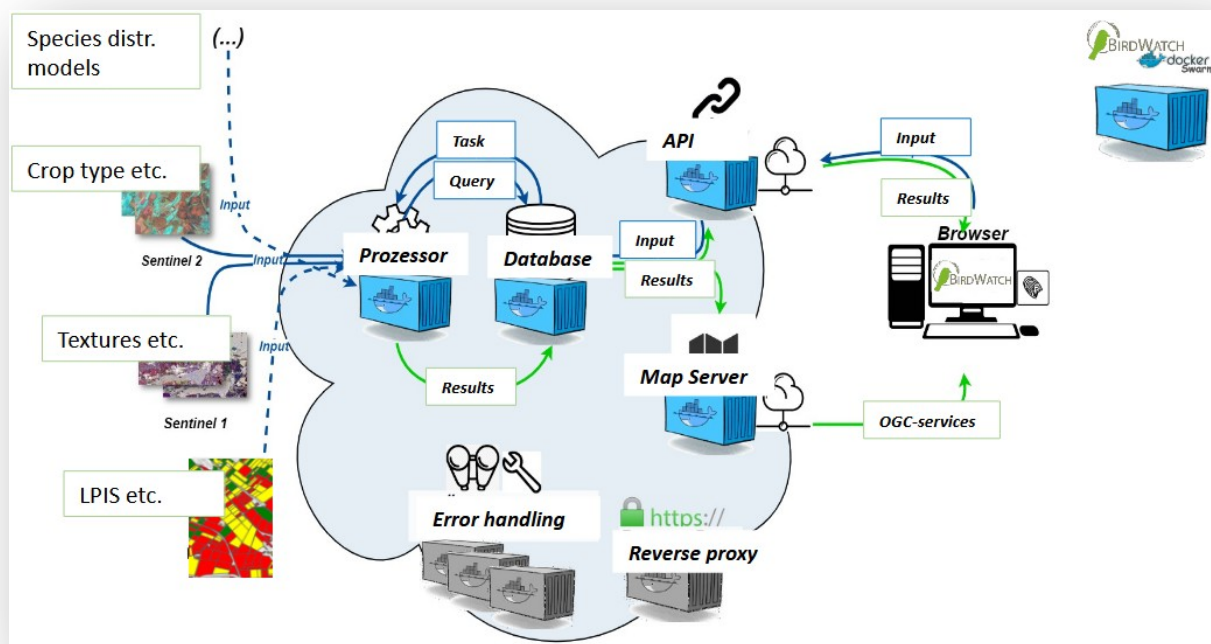


## WP 6200 - Platform development

Once the user and software requirements, determined in WP2000 and WP7000, and the database, developed in WP6100, the web-based platform can be set up.

A service-oriented architecture is foreseen, with interfaces for different user groups, developed via an agile approach. This is accompanied by a holistic testing and validation framework regarding functionality, performance, compatibility and security.

Further software development guidelines cover the usability, process automatisation, modularity, migrability and scalability of the services.



**Fig. 22:** Potential software architecture behind the BirdWatch platform; to be developed and tested throughout the upcoming three years

## WP 6300 - Platform User Testing and Launch

The platform will be tested and validated in respect to

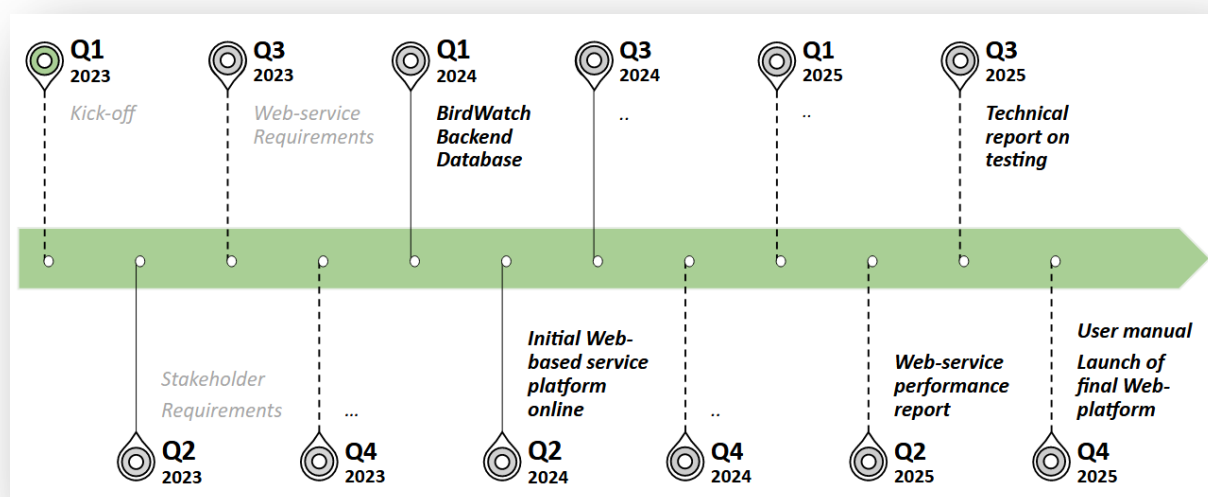
- the results from the stakeholder requirements analysis from WP2200
- the, in WP2300 defined, considerations regarding data input/output, data security and user roles
- The quality and correctness of, e.g., EO-feature time series or the results of the optimisation workflow
- Service performance, including considering the computational performance



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The testing and validation process will be iterative, accompanied by co-creation workshops and webinars, until the launch of the platform in M36 of the project's lifetime. The launch will also involve the publishing of a user manual and the organisation of a webinar to introduce users and stakeholders to the platform.

The time plan of the iterative development workflow is seen in the following figure.



**Fig. 23:** Time plan for the development of the BirdWatch platform

## WP7000 – Demonstration and User Uptake Evaluation

The development of the different components, as described above, will be evaluated and tested for quality and effectiveness by comprehensive key reviews in close collaboration with stakeholders. This will include the organisation and execution of demonstrations and training workshops with local stakeholders in all four demonstrator areas. The NPA and ADS have set up a list of key performance indicators (KPIs), to evaluate the performance with relevance to the stakeholders.

| KPI                                                                                                                                        | Target value - end of the project |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Overall access of the web-based monitoring service (number of interactions per month)                                                      | 100                               |
| Overall requests to the optimisation service (number of interactions with the service)                                                     | 10                                |
| Participants to local meetings (number per meeting/country)                                                                                | 80                                |
| Frequency of uploads of data by farmers / landowners (number per agricultural season per farmer)                                           | 50                                |
| Area covered by derived indicators measured through Copernicus data (km <sup>2</sup> )                                                     | 400,000                           |
| Area covered by datasets created by BirdWatch (km <sup>2</sup> )                                                                           | 400,00                            |
| Share of involved farmers that indicate positive change in relevant parameters (e.g., number of birds breeding on their land) (Percentage) | 30%                               |
| Increase in the extension of sustainable farmed land in the selected regions (percentage)                                                  | +10%                              |
| Increase in implemented farmland measures due to the optimisation suggestions of BirdWatch (percentage)                                    | +20%                              |
| Reduction of costs associated to ameliorate the quality of soil, water, crop healths, etc. (percentage)                                    | <30%                              |
| Improvement of biodiversity indicators where BirdWatch is used (percentage)                                                                | 30%                               |
| Number of interactions with BirdWatch, indicating increase in awareness (percentage)                                                       | +10%                              |
| Number of times BirdWatch has supported new policies or the change of policies (number)                                                    | 4                                 |
| Number of scientific publications                                                                                                          | 5                                 |
| Number of LOIs from external stakeholders involved in project events per region                                                            | 3                                 |

**Fig. 24:** KPIs for WP7000



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### **WP 7100 - Planning of the Demonstrators and Recruitment of Local Stakeholders**

This sub-WP will focus on the selection and collection of data and information for demonstrator areas as well as the planning of the demonstrator activities. Four types of business cases will be chosen and for each, a selection of pilot areas and stakeholders will be conducted, followed by the scheduling of the demonstration activities and the preparation of the performance evaluation procedure and surveys.

### **WP 7200 - Demonstration Activities**

Demonstration activities will take place in the test regions of Flanders, Germany, Lithuania and South Tyrol. The feedback of the stakeholders regarding the platform functionality and service in terms of logical consistency, thematic accuracy, suitability and relevance of the outcome, will be collected. Full-scale deployment will be tested as well, with the consideration of potential features to be implemented in a future expansion of the BirdWatch service (e.g., additional bird species, non-EU areas, etc.).

### **WP 7300 - Evaluation of the Demonstration Activities**

Feedback of the demonstration activities of WP7200 will be evaluated in terms of quantitative and qualitative aspects (refer to Fig. 23), also reflecting technical and operational performance. Additionally, the possible impact to CAP Green Deal regulations and national eco-schemes will be assessed.

### **WP 7400 - BirdWatch Training Workshops**

When the BirdWatch service has matured to satisfaction, training workshops in all four test regions will be carried out in order to transfer the necessary know-how to potential future users, to promote the BirdWatch platform and its service, to evaluate the overall potential users uptake and the willingness to use the BirdWatch platform-service in the future on full-scale.



## Important Decisions

### Management Structure

The remaining necessary number of individuals were added to the Steering Committee.  
The final members of the Steering Committee are listed in the table below.

| Name                                          | Beneficiary | Association with WPs   |
|-----------------------------------------------|-------------|------------------------|
| Annett Frick                                  | LUP         | WP1000, WP2000, WP6000 |
| Rik Hendrix                                   | VITO        | WP5000                 |
| Tomas Orlickas                                | NPA         | WP7000                 |
| Mariza Pertovt                                | Sinergise   | WP3000                 |
| Nastasja Scholz                               | LUP         | WP1000, WP2000, WP6000 |
| Ruth Sonnenschein                             | EURAC       | WP3000                 |
| Damaris Zurell ( <i>yet to be confirmed</i> ) | UP          | WP4000                 |

Additional meetings will be based on necessity, e.g., in the case of emerging risk factors.



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## Bioland Subcontract Issue

During an exchange together with Serena Biganami, from EUSPA, and Dr. Adriana Wipperling-Kepke, from the University of Potsdam, the following way forward was determined:

The Project Coordinator, together with the beneficiary of the University of Potsdam, will establish a detailed overview on

- a) the suggested additional sources for the budget height of 20,000 Euros.
- b) the suggested shifts within WP 4000, in order to re-allocate the remaining necessary 30,000 Euros for the subcontract for Bioland.

The detailed overview will then be shared with EUSPA, in order to decide if

- a) the official statement, requested by the University of Potsdam, regarding the possibility to use the University's household budget to cover the 20,000 Euros, can be issued by the EUSPA
- b) the suggested changes to WP4000 would be accepted by the funding authority

## Stakeholder Engagement

As the first project months are crucial to the roadmap of BirdWatch, it was decided to establish a dense meeting schedule, consisting of

- a) stakeholder focussed meetings and
- b) software focussed meetings.

It was decided that members of the WPs related to the stakeholder requirements and demonstration activities should take part in the software-related meetings while representatives of the software-focussed teams should join stakeholder-related meetings.

The feasibility to implement stakeholder requirements will therefore be possible to discuss with technical team members, while persons involved in stakeholder interaction and demonstration activities will be kept up-to-date on the technical aspects of the BirdWatch service development.

The following meeting frequencies were determined:

|                                      |                                                                                            |
|--------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Stakeholder-focussed meetings</b> | Once a week; decreasing along with the definition of stakeholder requirements              |
| <b>Software-focussed meetings</b>    | Bi-weekly; decreasing along with the definition of a detailed software development roadmap |

Furthermore, it was decided that lists of stakeholder types together with representatives of each stakeholder type are necessary.



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Within the consortium, multiple connections to representatives for different stakeholder types exist such that contact can be made quickly. Apart from the NPA, this includes BirdWatch's subcontractors INBO and Bioland e.V., as well as the connection to the LIFE Project Nardus & Limosa via Rik Hendrix from VITO. Some of the connections might even act as accelerators for further connections.

Additionally, farmer's collectives might be a good target group to engage as the willingness to use and pay for a service such as BirdWatch might be more likely than in the case of conventional farmers. Such collectives exist, e.g., in the state of Brandenburg, in Germany and in South Tyrol, Italy, and will need to be contacted in the upcoming weeks and months.

To facilitate the stakeholder requirement analysis, a mockup of the BirdWatch service should be set up, and include the habitat of two to three of the target bird species for illustration purposes. The list of habitat requirements for a subselection of the target bird species should be ready much earlier than June, better in April.

## Communication and Dissemination

### *External communication*

- The newsletter will be sent out via email (e.g., via Sendinblue<sup>15</sup>). Initially, it will be sent to the existing network of BirdWatch. The frequency of the newsletter and its layout remain to be decided upon.
- EUSPA's logo will be included in our templates, external outreach etc.
- Chiara Solimini suggested to use the hashtag **#EUSPACE** in our social media posts.

### *Internal communication*

- Nastasja Scholz has established a folder on the LUP's Cloud and will give access to it to all beneficiaries; this folder will be used to store important documents, such as the Grant and Consortium Agreements

The decisions regarding internal and external communication will be reflected in the Communication and Dissemination Plans to be set up within WP1300.

## Next in-person consortium meeting

Due to the density of deliverables due in M6 of the project's lifetime, it was decided to meet again soon.

The foreseen next in-person consortium meeting is thus scheduled for the month of June, 2023 and to be held in Potsdam, Germany. The exact date of the meeting is yet to be determined.

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<sup>15</sup> <https://pecbms.info/european-common-bird-indicators-2022-update/> (accessed on the 1st of March, 2023)





## Upcoming deliverables

As the outcomes of the requirements analyses regarding the bird species, the stakeholders and the system architecture are elemental for the roadmap of the subsequent tasks, focus of the discussion lay on the deliverables of the upcoming months until M6.

At the timing of the Kick-Off Meeting, the following deliverables between M1 and M6 are due:

| Deliverable | Name of Deliverable                                                                               | Target Month | Status  |
|-------------|---------------------------------------------------------------------------------------------------|--------------|---------|
| D1.1        | Minutes of the Kick-Off Meeting                                                                   | M1           | Overdue |
| D1.2        | Logo and Project Website                                                                          | M1           | Overdue |
| D1.8        | 1st Quarterly Report                                                                              | M3           | Open    |
| D1.3        | Initial project handbooks, data & risk management plans                                           | M6           | Open    |
| D1.9        | 2nd Quarterly Report                                                                              | M6           | Open    |
| D2.1        | Target Bird Species List                                                                          | M1           | Overdue |
| D2.2        | Bird Species Requirements List                                                                    | M4           | Open    |
| D2.3        | Stakeholder Requirements List - Flanders                                                          | M4           | Open    |
| D2.4        | User and Systems Specification                                                                    | M6           | Open    |
| D3.1        | Geospatial Database                                                                               | M6           | Open    |
| D3.2        | Dynamic tools to integrate harmonised Sentinel-2 and Landsat timeseries in the modelling workflow | M6           | Open    |
| D3.3        | Dynamic tools to integrate harmonised Sentinel-1 timeseries in the modelling workflow             | M6           | Open    |



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#### *Notes on the deliverables of WP1000 until M6*

- Two deliverables of WP1000 are slightly overdue (D1.1, D1.2) and require the finalisation of the draft by the end of this week (3rd of March, 2023).
- **D1.1** will be prepared immediately after the end of the Kick-Off Meeting.
- The draft of **D1.2** is in an advanced stage. For development and design purposes, LUP has launched the preliminary website of BirdWatch using a subdomain of the LUP website:  
<https://birdwatch-eu.lup-umwelt.de>  
 During the Kick-Off Meeting, the LUP has invited all beneficiaries to give feedback on the current content.  
 The foreseen final domain is “birdwatch.eu”, with the alternative domain “birdwatch-eu.org”. The registration is still an ongoing process.
- Regarding **D1.3**, the Project Coordinator has started on drafting the Project Handbook and is in charge of the selection of items to be covered in the Data Management Plan (DMP). The details of the DMP, including details on the observance of the FAIR principles, will then be filled by Sinergise and EURAC. The Risk Management Plan is under the responsibility of the Steering Committee and needs to be drafted within the upcoming months.
- **D1.8** and **D1.9** are part of the continuous reporting, under the responsibility of the Project Coordinator.

#### *Notes on the deliverables of WP2000 until M6*

- **D2.1** is slightly overdue. The bird species selection for D2.1 is finalised and the draft of the deliverable is close to ready. The handover of the draft to the Project Officer and the Reviewers is foreseen to occur within the week of the Kick-Off Meeting.
- To quickly and efficiently collect the requirements for the bird species, the stakeholders and the system architecture (**D2.2**, **D2.3** and **D2.4**), a rigorous meeting schedule was decided upon (see section on Important Decisions).

#### *Notes on the deliverables of WP3000 until M6*

- The deliverable **D3.1** is strongly interlinked to the requirements analyses. Therefore, representatives from EURAC and Sinergise will take part in the software- and stakeholder-focused meetings.
- The EO-data workflows, which are part of **D3.2** and **D3.3** are already available and only need to be adapted to the BirdWatch service. This will be discussed in frequent software- and stakeholder-focused meetings



## Appendix

### Introductory Meeting and Excursion, 27<sup>th</sup> of February

The day before the Kick-Off Meeting was dedicated to get to know each other and to visit the LIFE project Nardus & Limosa and organised by Rik Hendrix (Natuurpunt / VITO).

The agenda of this day is listed below.

| Consortium Introduction |                                                                                                             |                   |
|-------------------------|-------------------------------------------------------------------------------------------------------------|-------------------|
| 09:30 – 10:00           | Arrival & coffee                                                                                            |                   |
| 10:00 – 10:15           | Welcoming words and introduction of the LUP                                                                 | VITO & LUP        |
| 10:15 – 11:25           | Introductions of the individual partners (10' per partner)                                                  | ALL               |
| 11:25 – 11:40           | Coffee break                                                                                                |                   |
| 11:50 – 12:00           | Short discussion regarding the excursion                                                                    | VITO / LUP        |
| 12:00 – 12:30           | Presentation of the LIFE project Nardus & Limosa<br><a href="#">More info here</a> and <a href="#">here</a> | VITO / Natuurpunt |
| 12:30 – 13:30           | LUNCH                                                                                                       |                   |
| Field Visit             |                                                                                                             |                   |
| 13:30 – 18:00           | Field visit to the LIFE project Nardus & Limosa with electric bikes<br>Bring your binoculars if possible    | ALL               |
| 18:00 – 20:00           | OPTIONAL: bouldering initiation or team challenge (TBC)                                                     | ALL (optional)    |
| 20:00 – ...             | Dinner (on partner's own project budget)                                                                    | ALL               |



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