

Birds @ Farmland

Selection of Agricultural Systems

Background paper

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DEVELOPING TOOLS TO SUPPORT FARMLAND BIRD CONSERVATION IN THE EU

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Europe's diverse farming landscapes cover more than half of the EU territory. The Birds@Farmland initiative was tasked to select ten representative agricultural systems and fifteen typical farmland bird species across the EU to deliver a representative set of options for developing twenty conservation schemes.

Scope of Work Package 1: Conservation information for major agricultural systems

Work Package 1 aimed at gathering the best available conservation science on the main agricultural systems important for farmland birds and on associated bird species to provide a useful insight for the elaboration or modification of Member States' planning tools linked to nature legislation, CAP Strategic Plans and other EU funding instruments. This background paper summarizes the results of the first two of the six tasks included in this work package:

- T1.1 Identification of a **classification system** for European agricultural systems (AS).
- T1.2 Identification and characterization of at least **10 major EU agricultural systems**.
- T1.3 Characterization of the **causes of avian decline**.
- T1.4 Identification of **management options and landscape characteristics** that benefit bird species.
- T1.5 Potential **co-benefits** for other species and habitats.
- T1.6 **Synthesis** of findings, including main knowledge gaps.

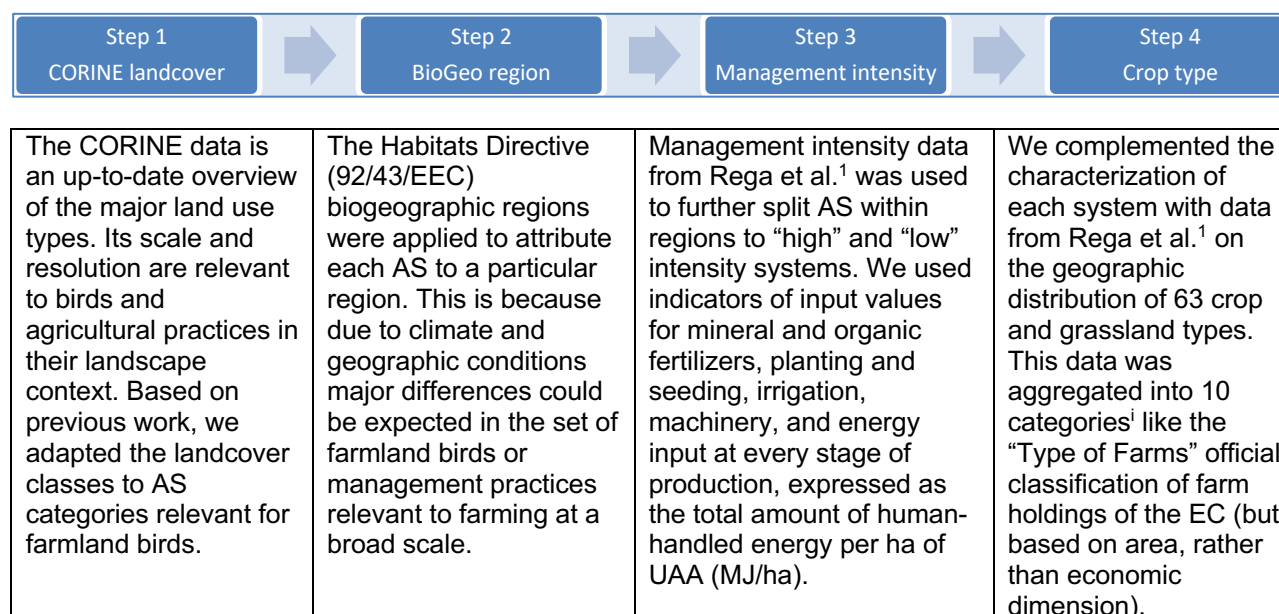
Review of existing European classifications for agricultural systems and selection of the most relevant classification

We assessed the existing approaches for classifying agricultural systems through a set of criteria relevant for the objectives of this contract: (a) availability of information across the EU; (b) availability of spatially-explicit mapping across the EU; (c) degree of linkage to bird ecology and conservation (including accounting for non-crop landscape features); (d) degree of meaningfulness for farmers; (e) potential to define policy and management options for the design of conservation schemes; (f) correspondence with other relevant classification systems. No single approach was found optimal, but [CORINE](#) and [Farm Structure Surveys](#) (FSS) based approaches were found most suitable. While CORINE performs better in terms of availability for spatially explicit mapping across the EU and correspondence with other relevant classification systems, FSS ranks better in terms of meaning for farmers and the potential to define agricultural management options benefitting farmland birds.

We subsequently focused on the set of existing studies using the two approaches (FSS and CORINE) and considered Rega et al. (2020)ⁱ, based on FSS/Eurostat data, as the most suitable for our needs, as it combines two relevant dimensions for farmland birds: (i) agricultural land uses (in terms of crop types), and (ii) management intensity (in terms of input intensity).

Adaptation of the most relevant classification for agricultural systems

After careful analysis, discussions with the EC, and to meet the requirements of the contract, we identified some limitations in the approach developed by Rega et al (2020) and therefore adapted it to our own four-step approach to select 10 European agricultural systems relevant for farmland birds:



As a result of this approach, we derived **46 agricultural systems** spread across the EU from four major categories: **arable crops** (13 types), **permanent crops** (7 types), **livestock systems** (17 types), **mixed systems** (9 types). For each system we produced a spatially explicit mapping (25 x 25 km grid; see Figure 1) across the EU, along with a description of the main land cover, intensity, and crop features (see Box). A more detailed characterization, among others on crop and livestock, will be made until December 2021 for the 10 identified priority agricultural systems.

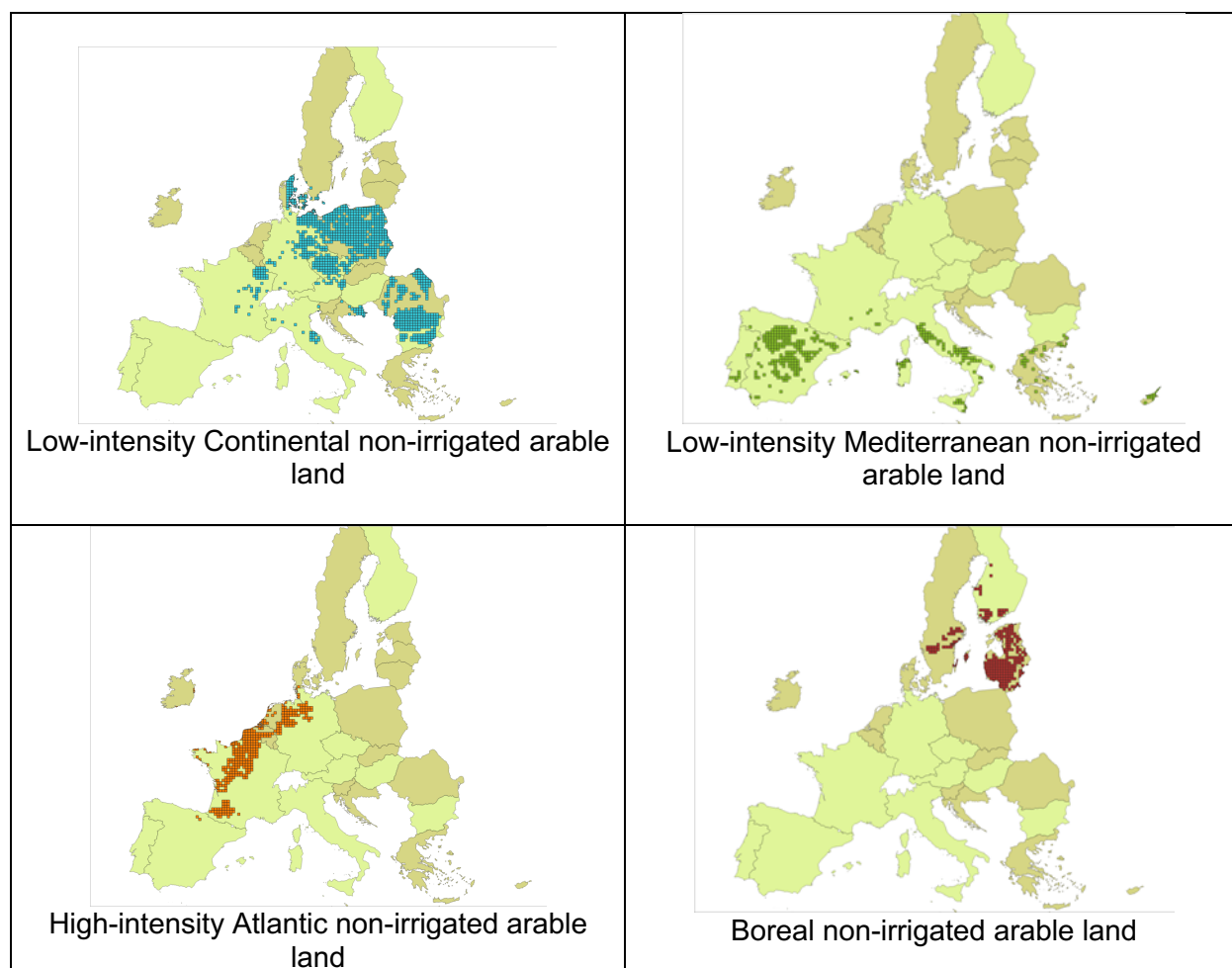
BOX: Example of agricultural system description

Mixed systems in complex Atlantic agricultural landscapes

Predominantly agricultural landscapes with a mosaic of small, cultivated land parcels with different cultivation types - annual crops, pasture and/or permanent crops. Includes agricultural mosaics with scattered houses, or garden huts, situated in proximity of rural or urban settlements and used for growing agricultural crops, fruit, and vegetable for own consumption. Also includes cultivated land parcels with non-permanent crops (mostly arable land) associated with permanent crops (fruit trees or olive trees or vines) on the same parcel. Widespread across the region, they have higher prevalence in North-western Iberian Peninsula, western France, Belgium and the Netherlands. The system includes a high diversity of landscape patterns, e.g. peri-urban areas in Belgium and “bocage” landscapes in North-western France. Dominant systems include mixed systems with predominance of arable land, grasslands and meadows. Specialist forage crops and specialist cereals also occur in the area. Management intensity usually high but variable (e.g. lower in Portugal and Spain, higher in Belgium and the Netherlands).

ⁱ Specialist vegetables, flowers and horticulture; Specialist vineyards; Specialist fruits and citrus fruits; Specialist olives; Specialist field crops – cereals; Specialist field crops – industrial crops; Specialist forage crops; Grassland and meadows; Mixed systems with prevalence of arable land; Mixed systems with prevalence of permanent crops or grasslands.

Figure 1: Illustration of the spatial distribution of some important agricultural systems. Countries where conservation schemes will be developed highlighted in light green.



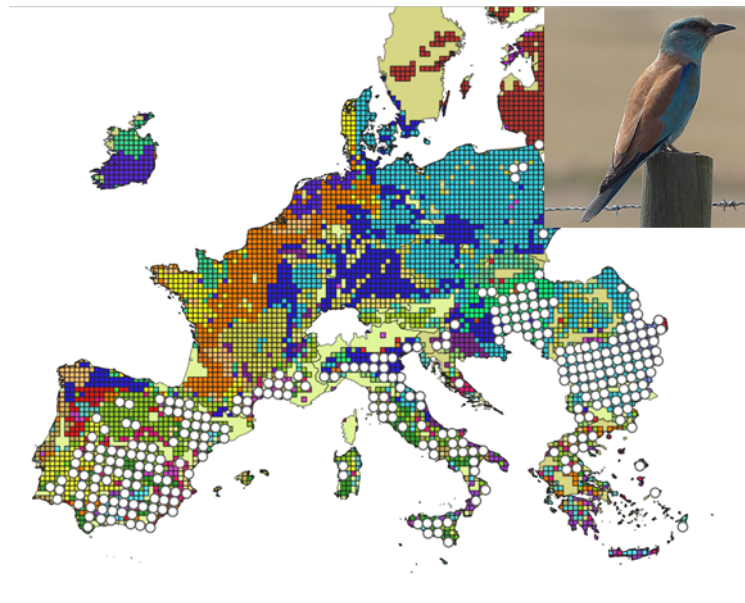
Identifying the more important agricultural systems for farmland birds

To identify 10 important AS for farmland birds, we the following criteria:

- **EU-level coverage** of each agricultural systems and occurrence in the 10 member states;
- **Number of farmland (breeding) bird species** associated to each agricultural system, based on the information of the second [European Breeding Bird Atlas](#);
- Occurrence of [Important Bird and Biodiversity Areas \(IBA\)](#) for farmland birds associated to each system;
- **Expert consultation and bibliography** on important agricultural systems for birds;
- Potential **for restoration** of features important to birds, assuming some high-intensity systems have the potential for management targeting the restoration of their bird populations;
- **Feedback from national workshops** held in spring 2021 in the 10 member states.

An example of matching farmland bird distribution across agricultural systems is presented in Figure 2.

Figure 2: Breeding distribution range of a farmland bird, the European roller (white circles), overlaid with the agricultural systems maps. Each colour represents a dominant agricultural system. Bird distribution data from the EBCC. Photo credit: Ines Catry.



Based on those criteria, ten AS were identified of **high relevance**:

1. Low-intensity Mediterranean non-irrigated arable land.
2. Mediterranean wood pastures.
3. Rice cultivation.
4. Low-intensity Continental non-irrigated arable land.
5. High-intensity Continental non-irrigated arable land.
6. High-intensity Continental permanent grasslands.
7. Mixed system of crop with significant natural vegetation in the Continental region.
8. Low-intensity Pannonian non-irrigated arable land.
9. High-intensity Atlantic permanent grasslands.
10. Boreal non-irrigated arable land.

Next steps

In the following months of the contract, we will continue with tasks 1.3 to 1.6 and:

- Characterization of the **causes of bird population decline for species associated with the 10 major agricultural systems**.
- Identification of **management options and landscape characteristics** that benefit bird species associated with the 10 agricultural systems.
- Evaluate potential **co-benefits for other species, habitats, and ecosystem services**.
- **Synthesis** of findings, including main knowledge gaps in relation to the previous points.
- Produce **report and factsheets** on concrete management options and landscape characteristics that benefit as many possible bird species associated with each of the 10 agricultural systems.

References:

ⁱ Rega, C., Short, C., Pérez-Soba, M., & Paracchini, L. M. (2020). A classification of European agricultural land using an energy-based intensity indicator and detailed crop description. *Landscape and Urban Planning*, 198 (March), 103793. <https://doi.org/10.1016/j.landurbplan.2020.103793>