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## Plan Overview

*A Data Management Plan created using DMPTuuli*

**Title:** Cumulative and interactive responses of species to climate change

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**Template:** Data Management Plan - Research Council of Finland

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### Project abstract:

Climatic conditions are shifting towards the poles due to climate change. Earlier studies have shown that species are responding to this by changing their i) phenology (e.g. advancing their reproductive season), ii) distribution ranges towards cooler areas, iii) morphology for thermoregulatory reasons or iv) habitat selection. Typically, these responses species exhibit have been studied one at time and the combined effects of two or more simultaneously operating responses of species have very rarely been examined. This weakens our holistic understanding of the climate driven impacts on nature. The aim of this project is to understand how responses to climate change interact with one another, whether there are differences in the magnitude of these various modes of responding and whether they differ spatially on a continental scale. To achieve these goals, I will use the most comprehensive large-scale long-term bird monitoring datasets available in Europe, covering the past 50 years.

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# Cumulative and interactive responses of species to climate change

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## 1. General description of data

**1.1 What kinds of data is your research based on? What data will be collected, produced or reused? What file formats will the data be in? Additionally, give a rough estimate of the size of the data produced/collected.**

Data includes bird ringing and bird survey data from different European countries. The data is in electronic format and includes millions of records.

**1.2 How will the consistency and quality of data be controlled?**

The data has been collected and quality checked by national coordinators using the European guidelines which makes the data consistent.

## 2. Ethical and legal compliance

**2.1 What legal issues are related to your data management? (For example, GDPR and other legislation affecting data processing.)**

The used data will not include names of the observers. All the data has been collected under the national regulations, especially concerning the ringing data which requires permissions by the national authorities.

**2.2 How will you manage the rights of the data you use, produce and share?**

The national data is owned by national coordinators and I will do contracts with the data providers if needed. This includes agreement about the data sharing and potential co-authorship. The open access of the data is preferred, but also I need to respect the willingness of the national coordinators if they do not wish the data be public.

## 3. Documentation and metadata

**3. How will you document your data in order to make the data findable, accessible, interoperable and re-usable for you and others? What kind of metadata standards, README files or other documentation will you use to help others to understand and use your data?**

Findable: The sources of the data will be clearly mentioned in all the research outputs. The European Bird Census Council and EURING are the European umbrella organisations of the bird surveys and ringing, respectively. These organisations can be used to request national datasets on a broader scale. ebcc.info and euring.org. I aim to make the data as much as possible openly available through international data archiving tools such as dryad. The Finnish data is already freely available in Laji.fi. I will aggregate the national data into a database where the data is in consistent format including the metadata and instructions for re-use purposes. The general information of the data can be already found in the web pages of EBCC and EURING.

## 4. Storage and backup during the research project

**4.1 Where will your data be stored, and how will the data be backed up?**

I will use university cloud services (One Drive) to store the data and for the back ups.

**4.2 Who will be responsible for controlling access to your data, and how will secured access be controlled?**

The responsible persons will be the PI and the hired postdoc and PhD student of the project. The primary data will be controlled by the national coordinators and we will only get a copy of the primary data. All the potential obvious typos in the primary data will be reported to the national coordinators to improve the quality of the primary data.

## 5. Opening, publishing and archiving the data after the research project

**5.1 What part of the data can be made openly available or published? Where and when will the data, or its metadata, be made available?**

The open access of the data need to be discussed by national coordinators, but in general the aim is to promote open access of the used data. The data will be stored in the data archiving systems such as dryad after the research papers have been published to be able to repeat the analyses.

**5.2 Where will data with long-term value be archived, and for how long?**

The primary data of used in the analyses will be stored by the national coordinators. I will only receive a copy of this. This data can be requested similarly by other researchers.

## 6. Data management responsibilities and resources

### 6.1 Who (for example role, position, and institution) will be responsible for data management?

The PI and the team (postdoc, PhD student) will be responsible for the data management of the data used in the research project. The national coordinators of the ringing and survey data will be responsible for managing the primary data. The PI is the main responsible person of the primary data in Finland.

### 6.2 What resources will be required for your data management procedures to ensure that the data can be opened and preserved according to FAIR principles (Findable, Accessible, Interoperable, Re-usable)?

This is part of the research procedure of the project funded by the Research Council of Finland. The project funding includes the needed resources. In addition, the resources of the Finnish Biodiversity Information Facilities coordinated at the Finnish Museum of Natural History can be used if needed.