European Vegetation Archive

Data Request Form

To obtain data from the European Vegetation Archive (EVA), including the ReSurveyEurope Database, please first enquire the EVA database administrator Ilona Knollová (ikuzel@sci.muni.cz) whether the data that meet your needs are available. If they are, please fill in the form below and submit it to Ilona or another member of the EVA Coordinating Board (or ReSurveyEurope Board if you ask for data from the ReSurveyEurope Database).

- Applicant's name:

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- Applicant's institutional address:

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- Project title:

  Spatial analysis of functional need for assisted migration

- Are you asking for core EVA data (non-repeated vegetation surveys) or for ReSurveyEurope data (repeated vegetation surveys)?

  We would like request both core EVA data and ReSurveyEurope data. While we are not focused on comparing the same vegetation plots over time, the ReSurveyEurope data could enhance spatial coverage, making it highly valuable.

- Brief description of the aims and methods of the study:

  Climate change is altering habitats at an unprecedented speed. This forces species distribution ranges to shift, generally to higher latitudes and altitudes (Chen et al., 2011). Unfortunately, habitat fragmentation and slow dispersal rates hinder many plant species from tracking these changes, especially at the leading edges of habitat ranges (Mendes et al., 2024; Rubenstein et al., 2023). This could lead to the local extinction of some plant species and reduced levels of ecosystem functioning.

  Traditional adaptive management strategies to maintain ecosystem functioning are to increase landscape connectivity, mitigate local stressors, and increase the species and genetic diversity (Hylander et al., 2022; Moore & Schindler, 2022). Unfortunately, given the unprecedented velocity of climate change, these strategies may be insufficient and interventionist management strategies, such as the assisted migration of plant species,

may additionally be required (Prober et al., 2019). Functional assisted migration (FAM) — deliberately introducing alien plant species better adapted to the future environmental conditions to fill functional gaps in the recipient community (Lunt et al., 2013; Van Meerbeek et al., 2025) — is controversial due to the risk of introduced species becoming invasive. To minimize this risk, the introduced species should be co-evolved with the recipient community, the species should be adapted to the future environmental and edaphic conditions in the target region, and translocations should be short-range, tracking the introduced species' distribution range shift (Van Meerbeek et al., 2025). Even still, functional assisted migration should only be considered where traditional adaptive management strategies are very likely to be insufficient to maintain ecosystem functioning, which is unfortunately difficult to determine. This study aims to fill that knowledge gap by modelling the effect of climate change on the functional diversity of European grasslands under different management strategies.

We will build species distribution models for European grassland species with a sufficient number of occurrences (> 50), using boosted regression trees to map the future potential habitable ranges under end-of-century climate change scenarios. Next, we will model how well each species will be able to track its habitat shift from its current distribution to its potential future habitable range under a scenario of low natural migration and a scenario of high natural migration. Lastly, we will compute functional diversity metrics for each scenario to examine whether natural migration alone could sustain functional diversity at similar levels. For regions where we predict large declines in functional diversity, we will further examine the viability of functional assisted migration to maintain functional diversity.

This study is framed within the ERC-funded project FutureNature, addressing assisted migration as a means to ensure ecosystem functioning in future ecosystems under climate change.

Chen, I.-C., Hill, J. K., Ohlemüller, R., Roy, D. B., & Thomas, C. D. (2011). Rapid Range Shifts of Species Associated with High Levels of Climate Warming. *Science*, *333*(6045), 1024–1026. https://doi.org/10.1126/science.1206432

Hylander, K., Greiser, C., Christiansen, D. M., & Koelemeijer, I. A. (2022). Climate adaptation of biodiversity conservation in managed forest landscapes. *Conservation Biology*, *36*(3), e13847.

Lunt, I. D., Byrne, M., Hellmann, J. J., Mitchell, N. J., Garnett, S. T., Hayward, M. W., Martin, T. G., McDonald-Maddden, E., Williams, S. E., & Zander, K. K. (2013). Using assisted colonisation to conserve biodiversity and restore ecosystem function under climate change. In *Biological Conservation* (Vol. 157, pp. 172–177). https://doi.org/10.1016/j.biocon.2012.08.034

Van Meerbeek, K., Spreij, S., Geuskens, M., Liu, C., Goossens, W., & Haesen, S. (2025). *Functional assisted migration to sustain ecosystem functions under climate change*. https://doi.org/10.32942/X2PS61

Mendes, S. B., Olesen, J. M., Memmott, J., Costa, J. M., Timóteo, S., Dengucho, A. L., Craveiro, L., & Heleno, R. (2024). Evidence of a European seed dispersal crisis. *Science*, *386*(6718), 206–211. https://doi.org/10.1126/science.ado1464

Moore, J. W., & Schindler, D. E. (2022). Getting ahead of climate change for ecological adaptation and resilience. *Science*, *376*(6600), 1421–1426.

Prober, S. M., Doerr, V. A. J., Broadhurst, L. M., Williams, K. J., & Dickson, F. (2019). Shifting the conservation paradigm: a synthesis of options for renovating nature under climate change. In *Ecological Monographs* (Vol. 89, Issue 1). Ecological Society of America. https://doi.org/10.1002/ecm.1333

Rubenstein, M. A., Weiskopf, S. R., Bertrand, R., Carter, S. L., Comte, L., Eaton, M. J., Johnson, C. G., Lenoir, J., Lynch, A. J., Miller, B. W., Morelli, T. L., Rodriguez, M. A., Terando, A., & Thompson, L. M. (2023). Climate change and the global redistribution of biodiversity: substantial variation in empirical support for expected range shifts. *Environmental Evidence*, *12*(1), 1–21. https://doi.org/10.1186/S13750-023-00296-0/FIGURES/5

- Will someone else be involved in data editing or analysis in addition to the applicant?

Senne Spreij (PhD student), dr. Stef Haesen (co-promotor), prof. Koenraad Van Meerbeek (promotor)

- Estimated time of delivery of results (e.g., manuscript submission):

December 2025

- Geographic area needed (e.g., countries or range of geographic coordinates):

All

- Do you need plots to be georeferenced? If so, what is the minimum accuracy of plot location (in metres or kilometres) needed for your project?

Yes (plots need to be accurate within 5 km)

- Vegetation types needed (syntaxa):

Grasslands and lands dominated by forbs, mosses or lichens (EUNIS classification ‘R’)

- Other data selection criteria:
  - Exclude plots without information on plot size or date.
  - Exclude plot sizes > 1000 m²
  - Only select plots from 1980 onwards.

ReSurveyEurope

- All non-manipulated plots, from manipulated plots only manipulation corresponding to typical land uses.
- Exclude plots where the plant community composition has been directly manipulated by sowing, planting or removing of species.

- Envisaged publications:

One paper in a scientific journal such as Ecography

- Data deposition. Some journals require data used for the analysis to be stored in a public repository to ensure the repeatability of the analysis. According to EVA Rules, you are not allowed to store the original vegetation-plot data obtained from EVA. However, if you plan to publish in such a journal, you may deposit a reduced EVA-derived dataset that (1) would make it possible to repeat the analysis published in the paper and (2) does not contain any information not used in the analysis. For example, such a dataset can contain only a subset of species (e.g., only angiosperms or only neophytes), or replace species names with codes, or replace species cover values with presences/absences, or remove all the header data, or replace the exact plot coordinates by coarse grid-cell coordinates etc. If you plan to deposit reduced information from vegetation plots, please describe here what might be deposited. If the project developed so that you needed to deposit more information than specified here, you would need to ask specific permission from the Custodians of the EVA databases used in your analysis before the dataset is deposited.

Depending on the journal, we might need to deposit a reduced dataset, which possibly would comprise species richness, plot mean traits, plot sizes and coordinates, of the plots used, but we will NOT publish the species composition of the plots, nor other header data not used in the analyses.

- Plant trait data from the TRY consortium. If you plan to combine your analysis of vegetation-plot data with plant trait data, you can also request a dataset of 18 gap-filled traits for a large number of plant taxa prepared by the TRY consortium. These traits include Leaf area, Specific leaf area, Leaf fresh mass, Leaf dry matter content, Leaf C, Leaf N, Leaf P, Leaf N per area, Leaf N:P ratio, Leaf delta15N, Seed mass, Seed length, Seed number per reproductive unit, Dispersal unit length, Plant height, Stem specific density, Stem conduit density, and Conduit element length. This dataset can be provided to you by the EVA manager together with the vegetation-plot data. If you use this dataset, you must inform about your project the TRY data contributors who might be potentially interested and invite them as potential co-authors, assuming they will make an intellectual contribution to your paper. The list of the TRY data contributors will be sent to you together with the gap-filled trait dataset.

Yes, include all gap-filled traits

- Specification of the co-authorship arrangements in publications based on the requested data. Note that the EVA Rules recommend that co-authorship is offered to a representative of each database providing data that are particularly important for the project (e.g., a relatively large proportion of the final dataset used in the analyses or data from unique vegetation types or under-represented geographic areas). This database representative should be an expert in the topic of the project (not necessarily the custodian or deputy custodian), and this person should contribute to the project more than just by providing the existing data, e.g. by intellectual contribution to the concept of the paper, preparation of new data, or helping with data analysis, interpretation of the results or writing parts of the paper (see the IAVS Code of Professional Ethics: https://www.iavs.org/page/governance_code-of-proffesional-ethics). The project leader should enable active participation by regularly informing potential co-authors about the progress of the project from its early stage. The project leader should also make final co-authorship arrangements based on the real input of the individual contributors.

Following the guidelines of EVA and ReSurveyEurope, we will offer co-authorship to representatives of databases of particular importance in our analysis (e.g. those that contribute to at least 1% of the data in the final dataset), but expect intellectual contribution beyond data provision, for example involvement in the data analysis or manuscript writing/revision. Additionally, representatives of databases showing interest in collaboration are invited to fill in the online form provided by the ReSurveyEurope Board, which will be evaluated on individual request basis.

- Eligibility of the applicant to receive EVA or ReSurveyEurope data. Specify to which EVA or ReSurveyEurope database the applicant has contributed; if the applicant is not the custodian or deputy custodian of an EVA or ReSurveyEurope database, give a name of a custodian or deputy custodian who supports this data request.

Koenraad Van Meerbeek contributed to the BE_0001 database of ResurveyEurope.

- I agree with the terms of EVA Data Property and Governance Rules as approved on 26 May 2012 (http://euroveg.org/download/eva-rules.pdf).
- If I ask for ReSurveyEurope data, I agree with the terms of ReSurveyEurope Data Property and Governance Rules as approved on 6 April 2022 (http://euroveg.org/download/resurveyeurope-rules.pdf).
- In any result obtained based on EVA core data (non-repeated vegetation surveys), I will cite the EVA report article (Chytrý et al. 2016; https://doi.org/10.1111/avsc.12191). In any result obtained based on the ReSurveyEurope data (repeated vegetation surveys), I will cite the ReSurveyEurope report article as soon as it is published. In addition, I will cite individual source databases used in my project (if possible, in the list of References; if not possible, at least as a list of databases in the electronic supplementary material).
- If I ask for the plant trait data from TRY, I agree to invite to my project the TRY data contributors following the list received from the EVA database manager.

Leuven, Belgium, 26th of March 2025

Senne Spreij