MERLIN

Deliverable D3.1:

Screening maps: Europe-wide maps of the needs and potentials to restore floodplains, rivers, and wetlands with a range of restoration measures

MERLIN

Imprint

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MERLIN Key messages

1. MERLIN produced a mapping exercise using European datasets on the status of freshwater habitats, freshwater-related species, bird species, ecological state and pressures.
2. An innovative spatial aggregation of European river networks was developed to integrate all input data at the same resolution, and discretizing Europe into River Restoration Units (R2Us) for small and large rivers, with wetlands integrated into R2Us.
3. River restoration needs throughout the EU were assessed by identifying R2Us that failed to abide by the Habitats and Water Framework Directives.
4. Ecosystem Services (ES) assessment was made at the R2U level throughout the EU by combining information on 5 ES delivered by freshwater ecosystems.
5. Limitations to restoration were evaluated at the R2U level using the Human Footprint Index as a proxy to restoration constraints.
6. Areas where restoration actions might be facilitated or passively enabled were determined by identifying the amount of freshwater protected areas (N2K) by R2U.
7. Restoration potential of each R2U was determined as the combination of ES, restoration constraints, and restoration enablers.
8. Restoration needs and restoration potential were integrated to determine the R2Us in need of restoration that had the greater potential to be restored.
9. This identification provides valuable insights for an upscaling analysis of restoration potential across the EU that serves to effectively guide large-scale restoration, management, and conservation plans.

MERLIN Executive Summary

This mapping exercise is based on European-wide available datasets and was carried out at the River Restoration Units (R2U) resolution. This allowed all data to be integrated, related, and represented at the same resolution for the entire study area. The resulting maps present the current state of European freshwater habitats, related species, and variables that may affect their condition. The maps show where and if the objectives of the Birds, Habitats, and Water Framework Directives are being fulfilled, ultimately determining which R2Us require restoration.

To identify the R2Us with the highest potential for restoration, an assessment of freshwater-related ecosystem services was performed, which was then combined with potential constraints to restoration (the Human Footprint Index was used as a proxy for multiple human uses), and restoration enablers (protected areas within or encompassing freshwater habitats).

The maps are divided into core maps presented in the report and auxiliary maps presented in the annex. They are grouped into categories to provide a clear overview of the different aspects considered in the mapping exercise. They are grouped into:

- Mapping restoration needs
- Mapping restoration potential
- Integration of restoration needs and restoration potential

The outcomes of this mapping exercise should inform restoration managers on the areas in need of restoration and with the highest upside for restoration. Although further analysis is necessary for the intra-R2U restoration, conservation and management planning due to the resolution of the mapping exercise, these maps offer a unique integrated perspective on freshwater habitats at a continental scale and serve as key guidelines for large-scale planning.

Overall, this exercise highlights the challenges faced by freshwater habitats and related fauna throughout Europe – challenges that are partially attributable to the pressures presented in this study but may also be exacerbated by future global changes. Urbanized and dry areas, in particular, are struggling to meet the objectives of overall directives, and they will be the most directly and indirectly impacted by future changes. While this may seem self-evident, it is rarely presented to this extent. Restoration of freshwater systems has the potential to be transformative, providing critical ecosystem services and delivering extended co-benefits at the landscape level.

Content

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1 Introduction

Europe's environment is currently in a state of alarm, and the threat of climate change is expected to further exacerbate this already critical situation. The ecological quality of freshwater systems is particularly at risk, as shifts in water availability, stress, and demand will directly impact these systems. This, in turn, will degrade the status of species and habitats, despite many of them being protected under directives that Member States must adhere to. In response, river restoration is gaining momentum as part of the European Green Deal, particularly through the European Biodiversity strategy and the proposed restoration law that set ambitious goals for restoration throughout the EU.

Freshwater restoration has a long tradition and extensive knowledge, making it the ideal demonstrator of the necessary changes required to improve the state of Europe's ecosystems. Currently, these ecosystems are degraded and no longer provide the ecosystem services needed to mitigate these threats. Ecosystem restoration has the potential to benefit biodiversity and combat climate change while also benefiting the economy and society. However, current restoration practices are too often small-scale and piecemeal, failing to respond effectively to the ecological crisis. Additionally, restoration measures are often not "owned" by key sectors such as agriculture, water industry, and energy, making them a niche activity for environmental and conservation regulatory agencies and funds.

This crisis necessitates mainstreaming ecosystem restoration at the landscape scale to address environmental, social, and economic concerns. Large-scale and multi-purpose ecosystem restoration is a centrepiece of a necessary transformative change in society, promoting nature-based solutions as a key and powerful measure to address the evident socio-ecological and climate challenges.

To that end, MERLIN capitalizes on useful European-wide datasets to produce a mapping exercise that informs the identification of freshwater areas in need of restoration. The River Restoration Units (R2Us) that do not comply with the habitats and species as well as the Water Framework Directives are particularly targeted. Through assessing freshwater-related ecosystem services across the EU, as well as potential constraints and enablers to restoration, MERLIN has determined the overall restoration potential of all R2Us. By confronting the restoration needs and potential, the mapping exercise has created a map of the potential to restore R2Us throughout the EU.

This mapping exercise has allowed for upscaling to the European level, identifying freshwater areas with high potential and priority for transformative restoration. It specifically focuses on essential ecosystem services, biodiversity, and conservation targets. Moreover, the spatialization of data analysis has made the mapping exercise a valuable communication tool that can be easily understood by policymakers, decision-makers, and the public alike.

Freshwater-related ecosystems, such as floodplains, lakes, and rivers, are critical in delivering on this ambition. Unfortunately, these ecosystems have been overused and degraded for centuries, leading to a significant decline in the vital services they provide, such as flood attenuation and carbon sequestration. These ecosystems were once hotspots of biodiversity in the landscape, but they have significantly declined over the past few decades and continue to deteriorate. Despite this, these ecosystems remain of high socio-economic importance, from the supply of clean water to the provision of recreation amenities. Large-scale restoration of freshwater-related ecosystems has great potential for restoring biodiversity and ecosystem services, and they are key in connecting land and sea.

This mapping exercise is not tasked with generating new data but rather leveraging the available data to capitalize on the knowledge that has been produced. The objective of this exercise is to integrate various datasets at a common resolution, enabling the detection of signals at a continental scale. The resulting work represents a comprehensive synthesis of existing data, facilitating a deeper understanding of the environmental state and restoration potential of freshwater ecosystems across Europe.

2 Study Area

Aiming to conduct a Europe-wide assessment of restoration pathways in freshwater-related ecosystems we used the River Restoration Units (R2Us) across Europe as the spatial resolution of the analysis. The R2Us are spatial aggregations of river segments that abide by the riverscape concept of river basins' functioning, thus respecting the directional, dendritic and hierarchical nature of river networks while also facilitating the aggregation of data from multiple sources with distinct resolutions. The study area includes all EU Member States (MS) and former Member States, along with small continental enclaves that share borders with multiple European countries (e.g., Switzerland, Norway and the Balkans) given that a substantial amount of data coverage (HFI, R2Us characterization datasets, climatic data, among others) goes beyond EU-MS borders and that most countries in these regions have close connections with the EU. On the eastern border of the EU, the delineation of the study area abided by the following criteria: a) maintain the R2Us as indivisible units, and; b) retain all the R2Us in which at least 10% of the area overlaps an EU-MS territory.

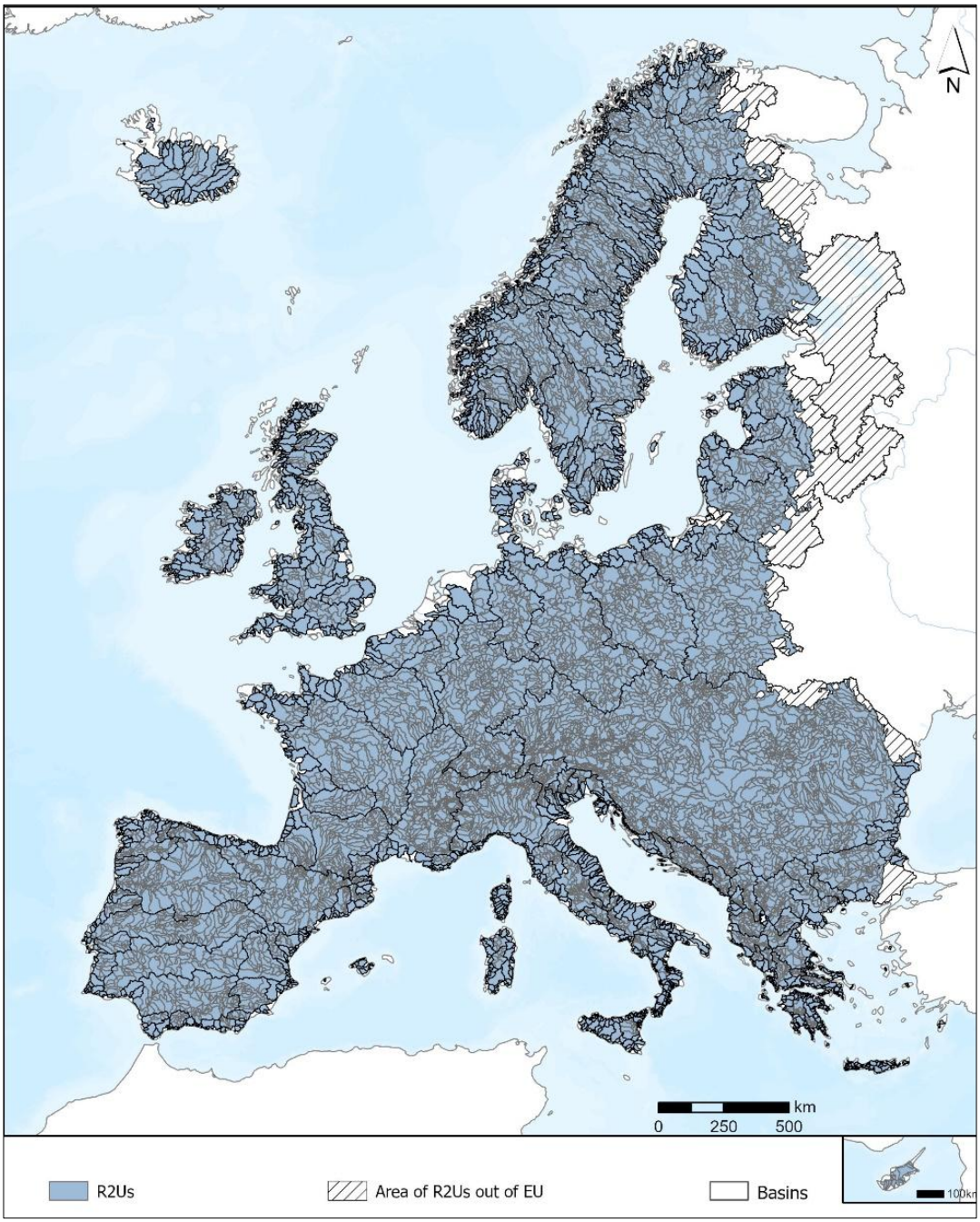

Figure 1. Study Area delineation at River Restoration Units (R2Us) spatial resolution.

3 Methodology

Providing a Europe-wide upscaling strategy for restoring freshwater-related ecosystems is the focus of Work Package 3 (WP3). In so doing, WP3 aims initially to assess Europe-wide restoration needs and potentials in freshwater-related ecosystems. Then, WP3 intends to replicate best-practice restoration measures to restore resilient and healthy ecosystems, demonstrating restoration benefits for biodiversity and associated key ecosystem services. Furthermore, WP3 seeks to characterize and exploit investment opportunities showcasing public and private financing mechanisms for implementing these restoration measures in selected areas. To meet the objectives of WP3, eight tasks have been defined: Restoration needs (Task 3.1), Restoration potential (EU-wide) (Task 3.2), Europe-wide screening of areas for restoration (Task 3.3), Modelling workflow for restoration assessment in selected basins identified in EU-wide screening (Task 3.4), Benefits and trade-offs of restoration (Task 3.5), Investment needs and opportunities for upscaling restoration (Task 3.6), Facilitating and leveraging private finance (Task 3.7) and European scalability plan (Task 3.8).

Conducting a Europe-wide screening of restoration needs (Task 3.1) and restoration potential (Task 3.2) leads to the identification of areas in need of restoration and where this has a potential upside in terms of Ecosystem Services (ES). The determination of the *Restoration Needs* is a representation of areas that do not meet the Water Framework Directive (WFD) objective of Good Ecological Status (GES) of surface waters and/or that do not abide by the Habitats Directive (HD) objective of favourable conservation status of species and habitats of community interest.

The *Restoration Potential*, as defined in this deliverable following the guidelines of the project proposal, identifies areas in need of restoration where ES assessment points towards low ES values, where there are few constraints to restorations and high restoration enablers. This allows the identification of areas where restoration can provide good outcomes with little obstacles to restoration measures implementation, in line with EU action programmes (the Biodiversity Strategy 2030 and the Paris Agreement) and contributing to reaching Green Deal objectives. Consequently, areas with higher restoration potential would be areas of restoration need that when intervened could potentially have higher ES co-benefits. Realizing that although some areas can have a high potential for restoration, they may be unable to be restored, introduced the concept of restoration constraints. In this work, we used the Human Footprint Index (HFI) as a proxy for all constraints to restoration. On the contrary, even though all EU territories must abide by WFD and Habitats Directive (HD), areas that are specifically protected have an even higher legislative significance, as Member States (MS) are obliged to attain favourable conditions. Considering areas with the same need for restoration but with distinct coverage by Nature 2000 protected areas, those with higher legislative pressure would be more appealing for managers to restore. This led to the inclusion of the restoration enabling areas. We used the percentage of Natura 2000 sites (N2K) within the floodplain and the percentage of wetland area included in N2K sites that fall outside of the floodplain as enabling areas to restoration. We classified our study area according to “restoration potential” combining the three components: ecosystem services assessment, restoration constraints, and restoration enablers. All were integrated into a Restoration Potential Indicator (RPI) whose low values mean a higher potential for co-benefits and easiness of action.

Finally, all R2Us were classified according to their Restoration Needs and Restoration Potential demonstrating the potential for restoration according to the restoration needs category. Therefore, the highest “Potential” would be in areas in need of restoration, which have low constraints to restoration, a high percentage of protected areas within the floodplain or encompassing freshwaters and high Ecosystem Services potential (low RPI).

4 Part I – Mapping restoration needs

River Units and freshwater-related ecosystems

Data and Methods

MERLIN aims to "identify landscapes with high potential and priority for transformative restoration, particularly focusing on essential ecosystem services, biodiversity targets, and climate change mitigation". Being part of this objective, this mapping exercise intends to establish European-wide restoration needs and potential in freshwater-related ecosystems. Thus, considering the nature of this exercise, the fact that multiple input sources will be used (having multiple resolutions and data typologies) and the wide extent of the analysis, having a common and coherent unit of analysis for outputs is crucial to have comparable and interpretable outputs. Moreover, given the specificities of freshwater ecosystems functioning, units should be able to abide by the directional, hierarchical and dendritic nature of river networks (Duarte et al., 2019). Considering this, we aimed to divide each sea outlet basin into a set of river units with no upstream dependencies that aggregate small watercourses (hereafter, small river units), connected by river units encompassing the mainstem watercourses of the basin (hereafter, large river units).

Segments are river stretches between confluences and for each confluence, one of the segments originating leading to it is considered a river mouth of a given drainage area. The Hack stream order values allow us to express the nestedness of the multiple river mouths that sea outlet basins encompass (Rigon et al., 1996).

For each mouth segment, at the multiple levels expressed by Hack stream order values, we add to define when it should become part of a distinct unit than the one of the next downstream contiguous segment. For this to occur a mouth segment had only to have a Strahler stream order (Strahler, 1957) equal to or above 3 (becoming a small river unit), but to become part of a large river unit, those connected to multiple small river units, it must abide by all the following rules:

- Strahler value is superior or equal to 4;
- Upstream drainage area is equal to or superior to 1000 km^2;
- Upstream river length is equal to or superior to 1000 km.

Sea outlet basins below Strahler 3 were discarded from the analysis and those where the maximum Strahler present is 3 are analysed as a whole and identified as small river basins. Finally, those small units draining directly the most upstream large river units present in a basin though having the same characteristics as the small river units, are identified as large river head units.

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Maps

Figure 2. Typology of River Restoration Units

Figure 3. Overlay of Wetlands with River Restoration Units

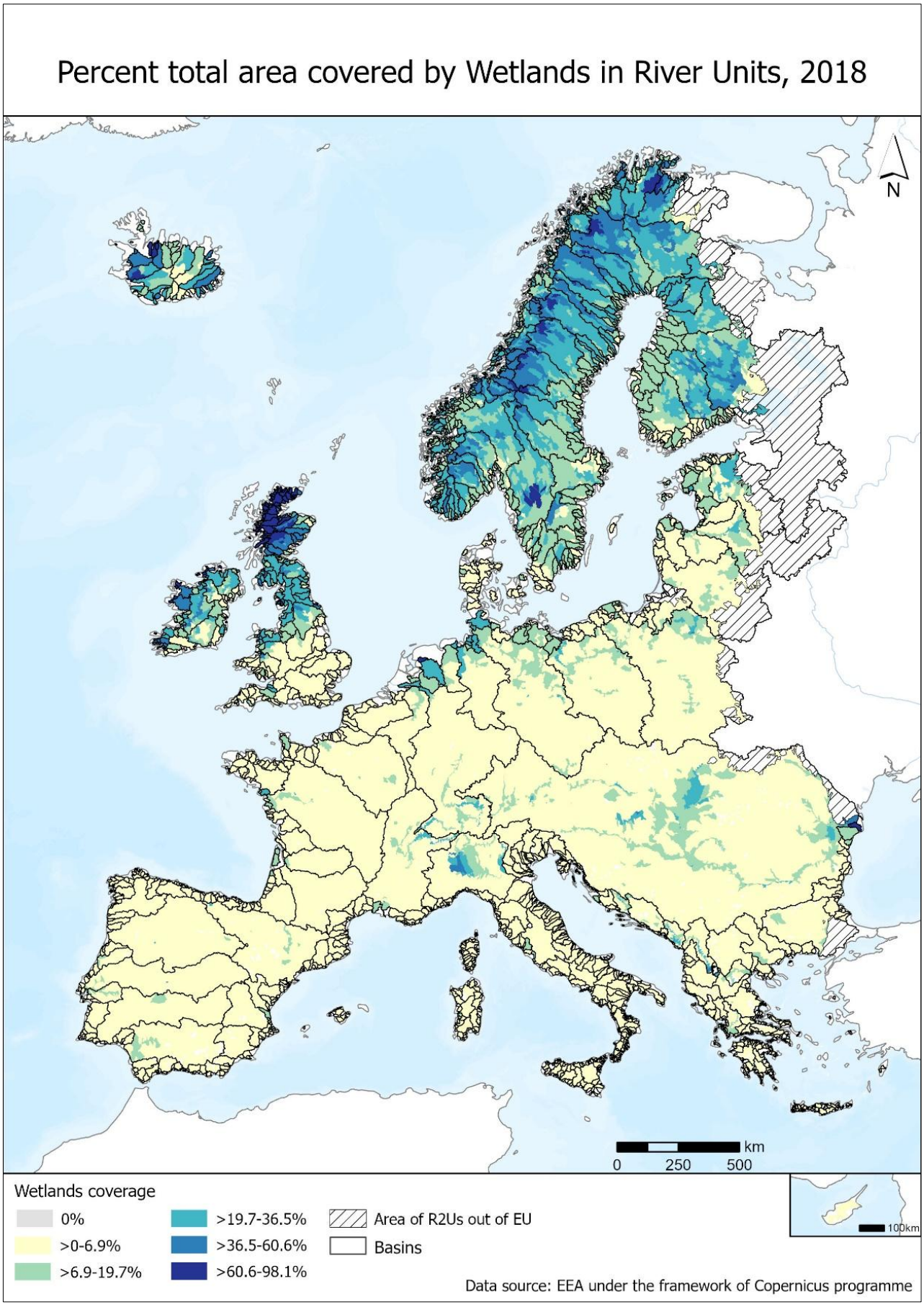

Figure 4. Percentage of Wetland area in Rivers Restoration Units

Habitats Directive

Data and Methods

The Habitats Directive (HD) was established as a target to restore or maintain a favourable conservation status for all species and habitats of community interest, i.e. those included in the annexes of the directive. Considering this, the concept of Conservation Status (CS) is paramount in European nature conservation policy and laws (Bijlsma et al., 2019). Each species and habitat is periodically evaluated and the CS is termed in four categories, one indicating favourable CS (Favourable – Fv), two indicating unfavourable CS (Unfavourable Inadequate – U1 and Unfavourable Bad – U2) and one expressing insufficient information (Unknown – XX) (Bijlsma et al., 2019). Within this framework, there is a need for conservation or restoration action when species or habitats do not meet the target of having favourable status.

For this document, the HD assessment made for the period between 2013 and 2018 was used to establish the restoration needs (data obtained via the Article 17 web tool: https://nature-art17.eionet.europa.eu/article17/). The Annex 1 of the proposal for a Regulation of the European Parliament and of the Council on nature restoration (Procedure number: 2022/0195/COD; European Commission, Directorate-General for Environment; Date: 22/26/2022) served as a guide to select the HD habitats related to freshwater ecosystems. Excluding the habitats related to marine and transition waters ecosystems, all of those present in groups 1, 2 and 3 were included in the analysis. For the species, the selection procedure followed the one used in Carrao et al. (2020a), where the International Union for Conservation of Nature's Red List database is used to assess which species are related to freshwater environments. Besides the study area previously established, in the case of the HD, data availability is established by the 10 by 10 km reference grid from the INSPIRE geographical grid systems. Only the R2Us from the study area having 50% or more of their area covered by this reference grid were considered to have data availability (conversely, the opposing R2Us will be classified as “No Data”). R2Us within the area of data coverage but where no species and/or habitat occur will be classified as “no species” and/or “no habitat”.

To determine the CS at the R2U resolution, the Composite Indicator of Conservation Status (ciCS) methodology developed by Carrao et al. (2020b) was followed. The ciCS aggregates the individual conservation status of multiple elements coexisting in the same unit into one categorical value of conservation status (Carrao et al., 2020b). The method establishes 15 possible categorical values (detailed option) nested into three 3 groups (aggregated option) – Very Low, Low and High – that in general express the dominant CS from U2 to U1 to Fv, respectively. Whenever the “Unknow” CS class is dominant in an R2U, the overall result of the ciCS was termed as “Unclassified”.

To account for topological inaccuracies and georeferencing imprecisions when intersecting the reference grid with the R2Us additional safeguards were adopted. Except for species/habitats with overall restricted spatial occurrence (less than 1000 km^2 or occurring in less than two R2Us), if the distribution covered less than 5% of the respective R2U and this represented less than 20 km^2, this presence was excluded from that specific R2U. This rule prevents species from being counted due to topological errors while accounting for R2U size heterogeneity. The CS classes of species and habitats reported per member state and biogeographical region were used to compute the ciCS. This means that for transnational and/or trans-regional R2Us it was necessary to account for species duplication. To avoid this while maintaining method consistency and coherence, the aggregated option of the ciCS procedure was used to determine the dominant CS class in these specific R2Us. Finally, for each R2U, the ciCS was calculated taking into consideration different grouping settings (e.g., species, habitats, species from the group “Amphibian”, habitats from the group “Forests”), enabling general and specific mapping approaches.

In the end, the results of the ciCS procedures conducted for both the protected freshwater habitats and the protected freshwater-related species under the Habitats directive were integrated by constructing a bivariate choropleth map. This allowed the several outcomes to be expressed and the R2Us to be classified accordingly.

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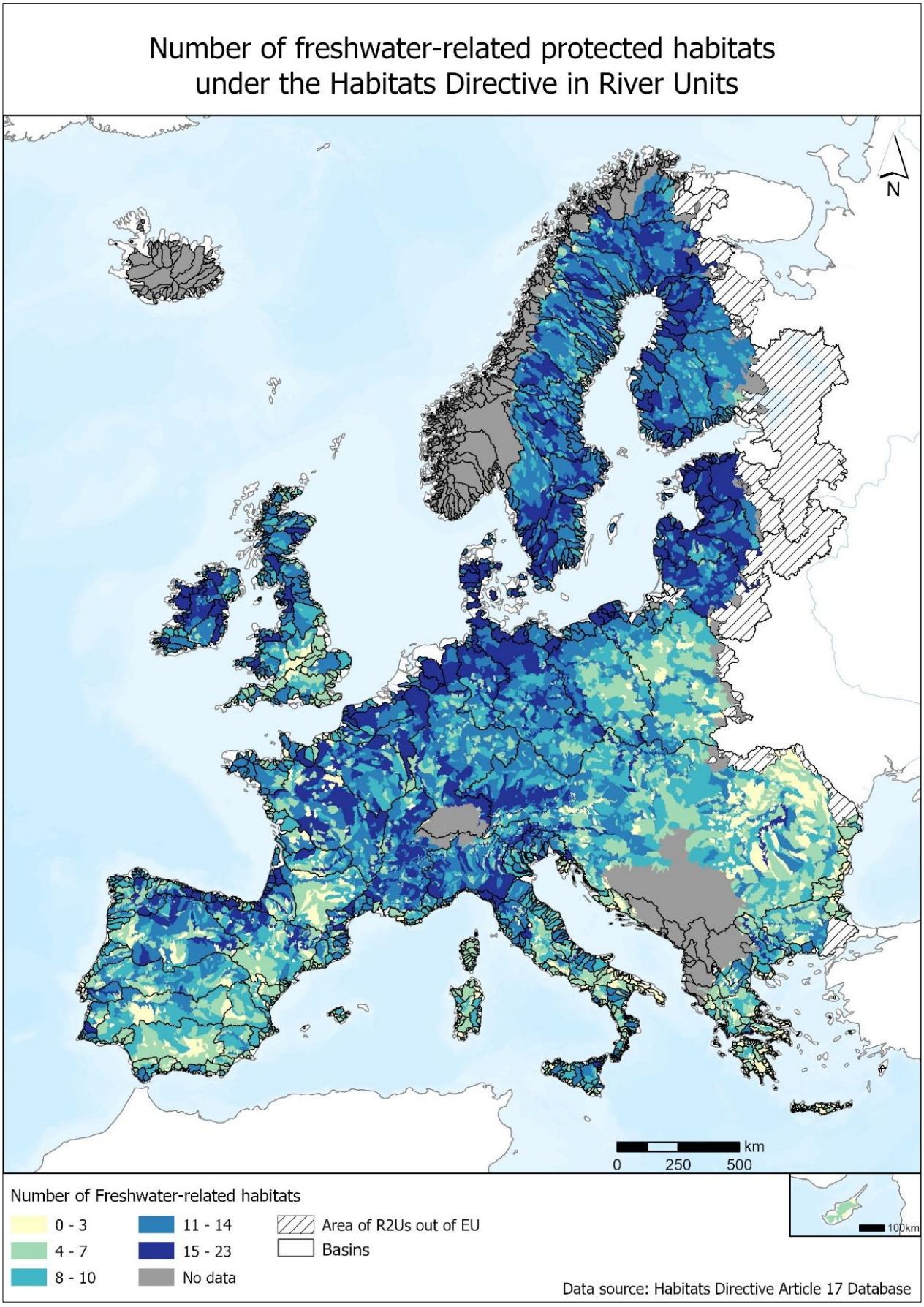

Figure 5. Number of freshwater-related habitats

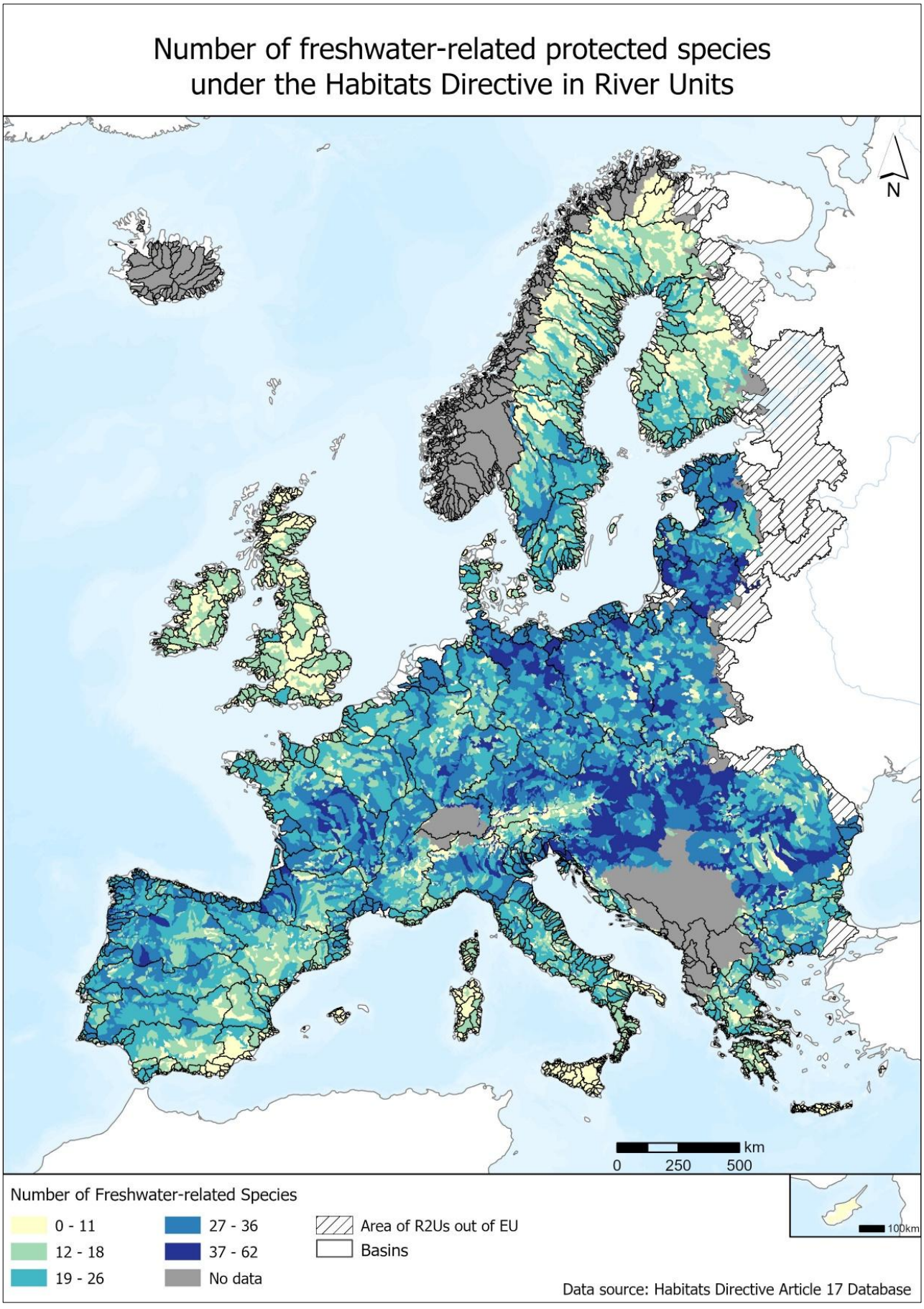

Figure 6. Number of freshwater-related species

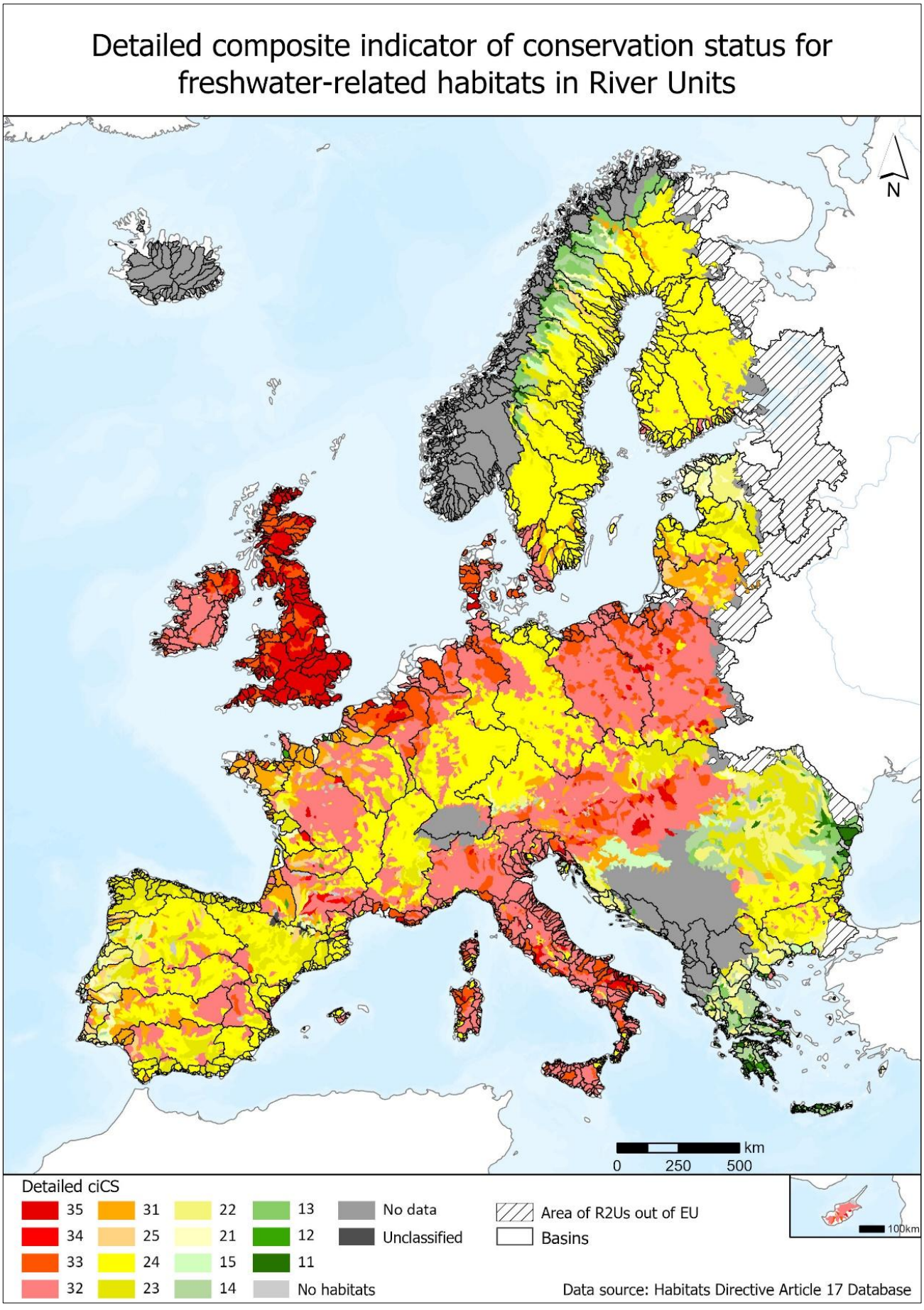

Figure 7. Detailed ciCS of habitats

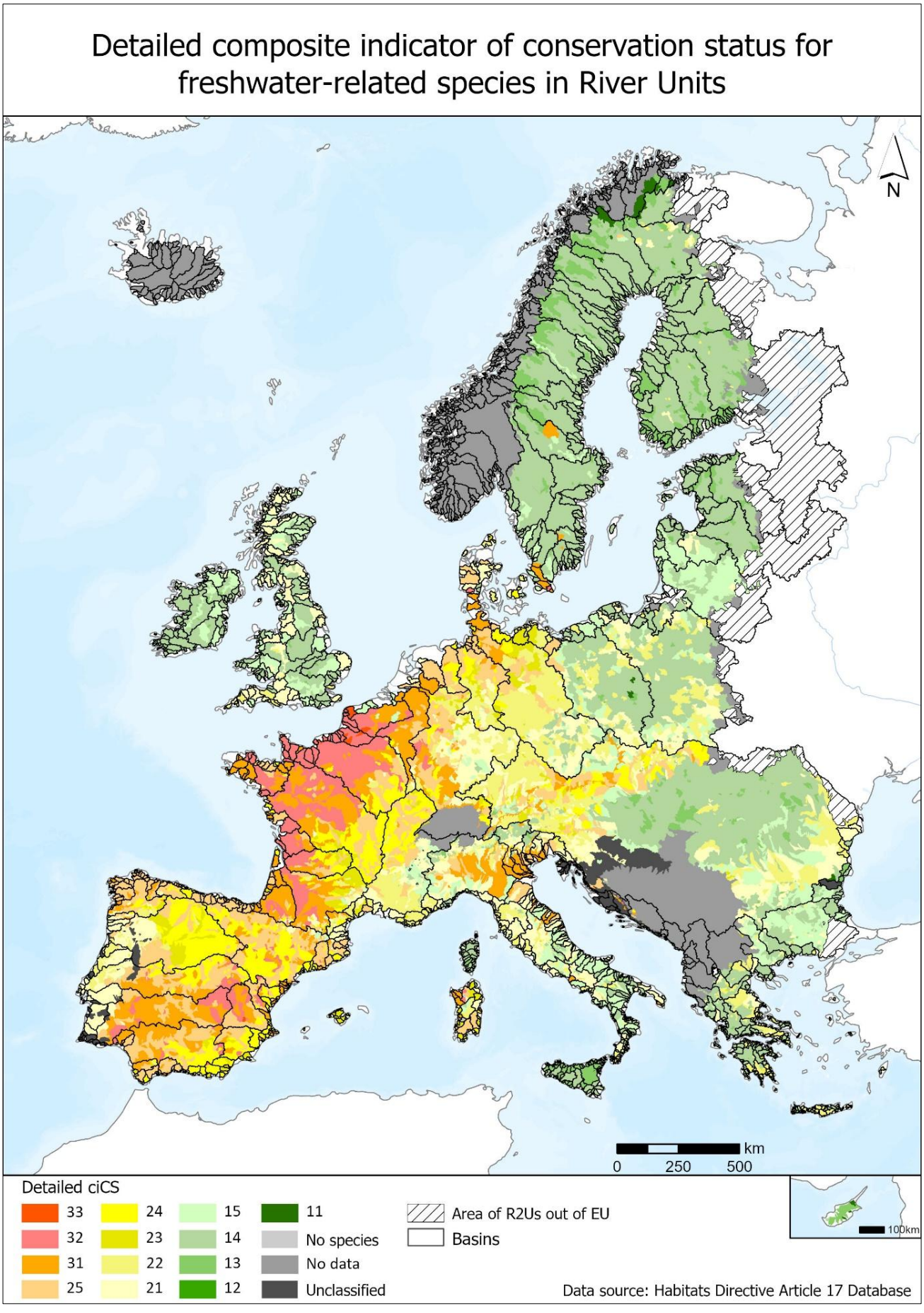

Figure 8. Detailed ciCS of species

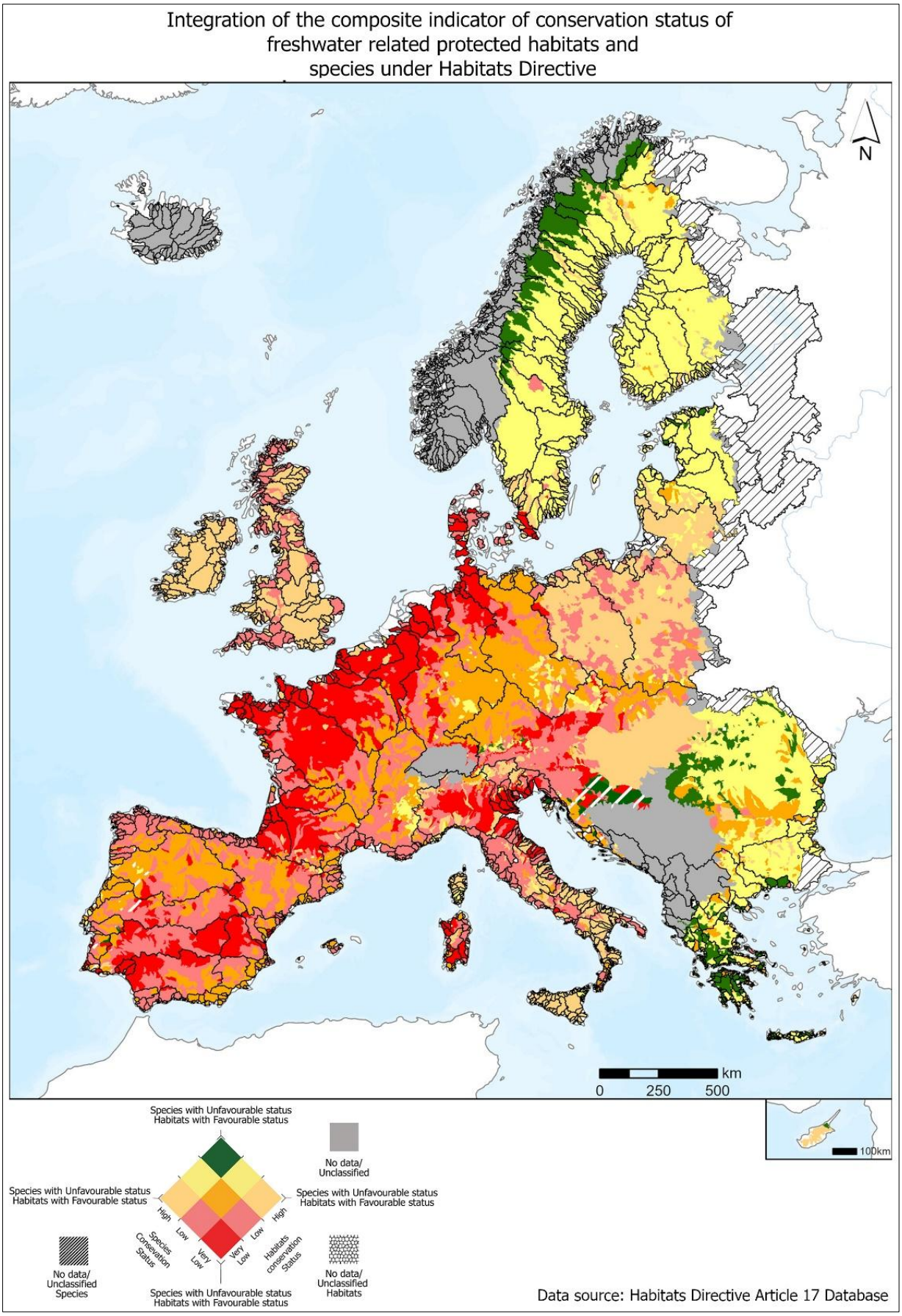

Figure 9. Integration between Habitats and Species ciCS

Birds Directive

Data and Methods

The Birds Directive (BD) expresses the same target as the HD and, although it expresses distinct CS classes, they are colour coded similarly to those of the HD. As such, the methods used here follow those indicated previously for the HD with necessary adjustments. For BD, the data obtained via the Article 12 web tool (https://nature-art12.eionet.europa.eu/article12/) covers the 2013 to 2018 period but only provides an evaluation for each species at the European scale. As such, no trans-national, nor trans-regional adjustments have to be made, but it also means that the reporting resolution is coarser than that of the HD (made per Member State and biogeographic region). This being said, mapping outputs are equitable to those of the HD but do not express the same detail and input resolution.

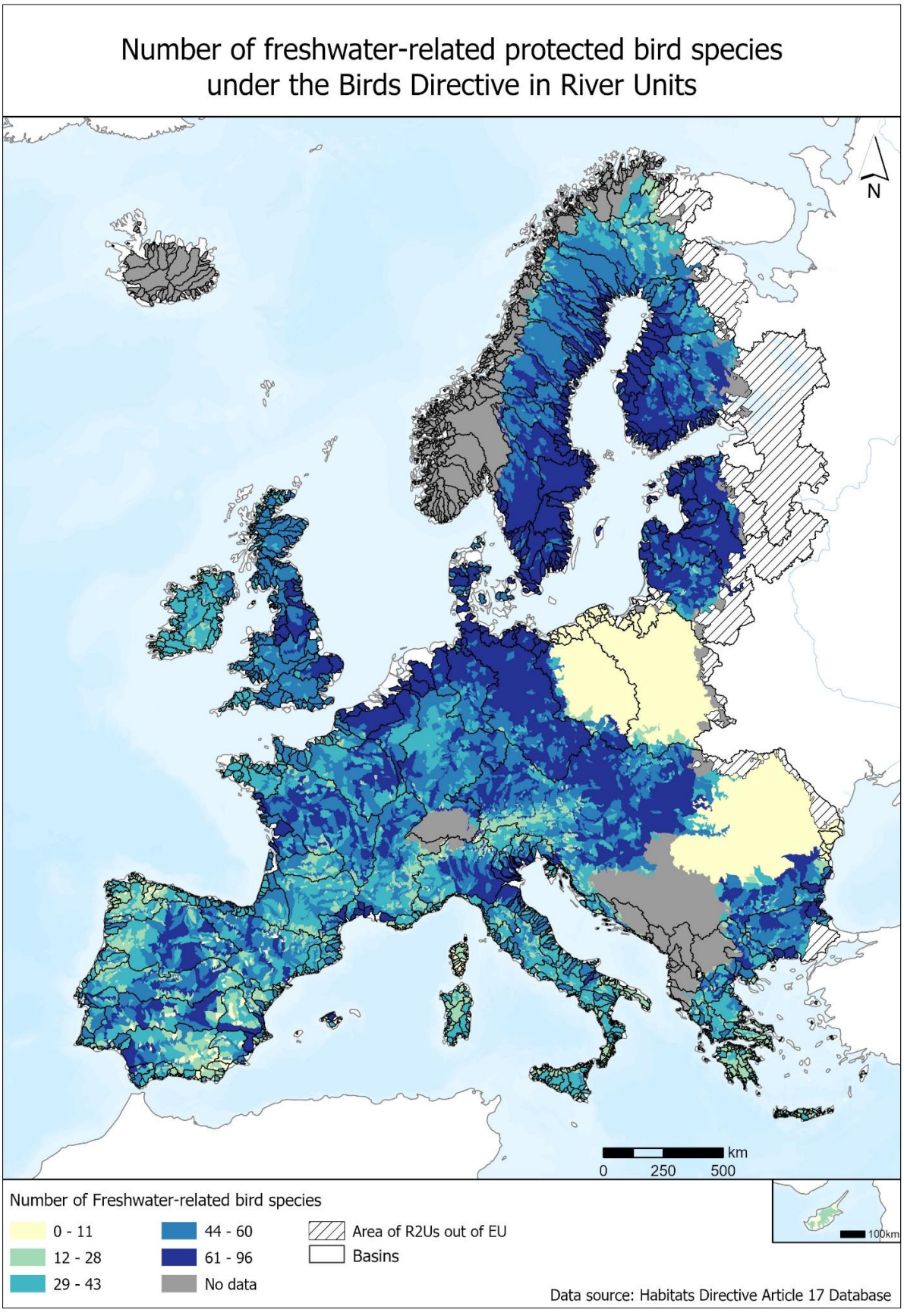

Figure 10. Number of bird species

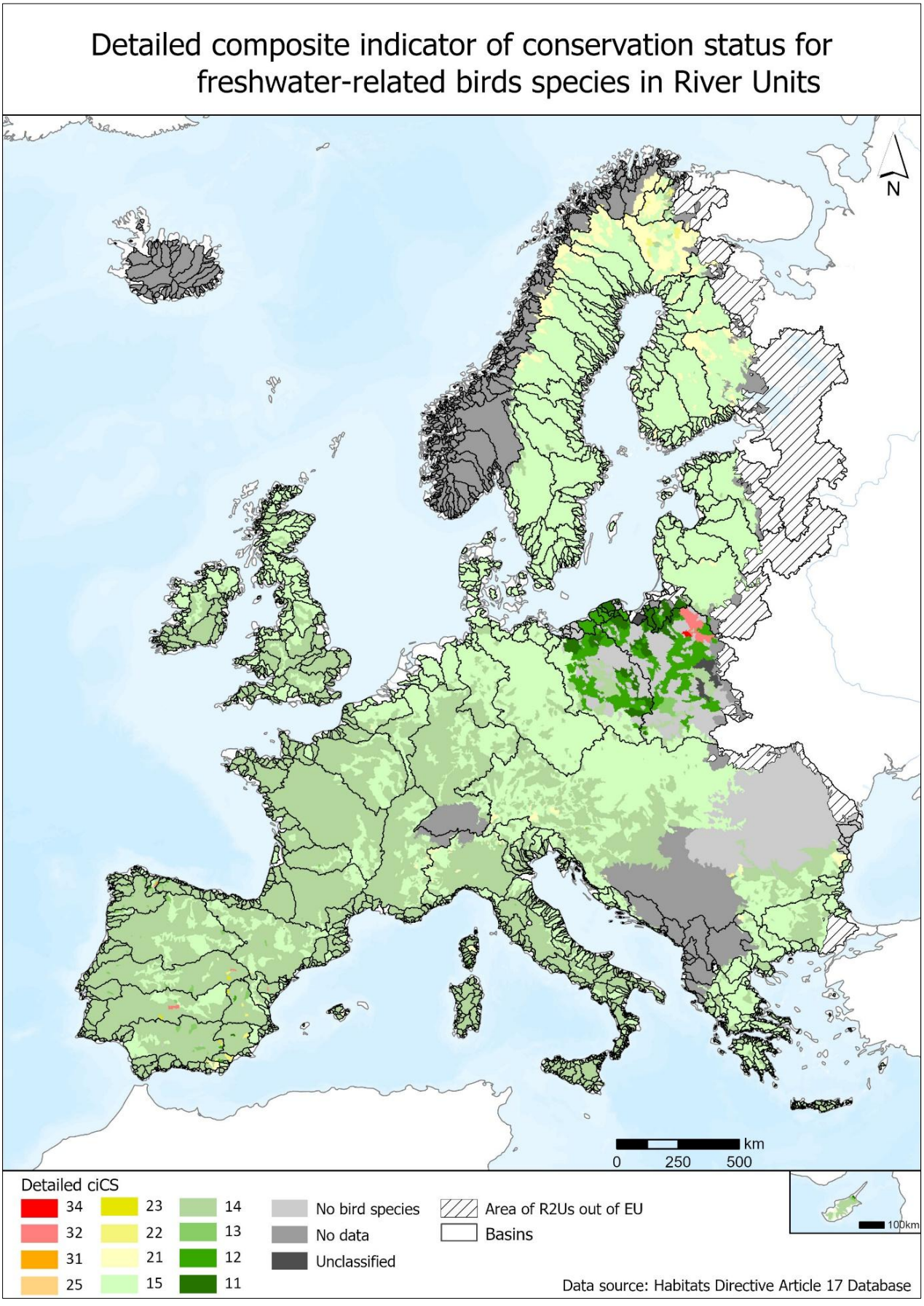

Figure 11. Detailed ciCS of bird species

Water Framework Directive

Data and Methods

The Water Framework Directive (WFD) reference spatial data sets derived from the first and second River Basin Management Plans (RBMP) were used to create the map with the surface water bodies (SWB). These datasets are part of the Water Information System for Europe (WISE), and compile information reported by the EU Member States, Norway, Iceland and the United Kingdom to the European Commission (EC) and the European Environment Agency (EEA) since 2010). For the UK we used the "WFD River Water Bodies Cycle 1", a polyline Shapefile dataset collated as defined for the implementation of the Water Framework Directive (WFD). The river polylines were defined by using the Environment Agency—General Quality Assessment (GQA) River Stretches dataset which was copied directly from the UK Centre for Ecology & Hydrology (UKCEH) 1:50 000 River Network with some additional stretches added in by the Environment Agency. The resultant WFD river water body dataset is a subset of the CEH network, including only stretches that meet any of the criteria for the WFD (Environmental Agency).

The spatial analyses were performed using the data produced by Vigiak et al. (2021), which portrays the probability of River Restoration Units to have: (i) good ecological status, (ii) nutrient pollution, (iii) organic pollution, (iv) chemical pollution, (v) altered hydrology, (vi) altered morphology and (vii) a lack of impacts. These probabilities were estimated using multiple logistic regressions based on the available European databases, particularly river conditions as reported by Member States for the second reporting round of River Basin Management Plans of the Water Framework Directive (conditions in 2010-2015), and European water pressure indicators derived from data and models (Vigiak et al., 2021). The probabilities express the likelihood of the respective condition. The presence of two clear peaks in the range of probabilities indicates that the explanatory variable-set can easily identify regions of low or high probability (below 40% and above 60%), relatable with the absence or presence of the condition (Vigiak et al., 2021). This probability region, from 40 to 60%, is thus considered an "uncertainty zone" because one minor change in an explanatory variable can alter the result towards the absence or presence of a condition (Vigiak et al., 2021). As such, a high number of cases in the 40–60% region or a limited range of probabilities suggest that the model is probably missing some key information to clearly identify the presence of the condition (Vigiak et al., 2021). This allows establishing three classes expressing river condition: segments with values below 40% were considered to be part of the "abiding" class, those above 60% as part of the "non-abiding"/"unaltered" class (the later class term was adopted for the altered morphology and altered hydrology datasets) and those in the uncertainty zone as part of the "uncertain" class.

Probabilities in this dataset have been identified at the segment resolution, a resolution unit that is nested in the unit of analysis (R2U). Given that each R2U generally contains multiple segments it was possible to maintain methodological consistency and coherence and apply the ciCS methodology as previously described with minor adjustments in the method, but with an important distinction of ciCS output class interpretation.

Analogously, only R2Us where the respectively nested primary catchment containing data covering 50% or more of its area were considered as having data availability. No transnational or regional incongruences occur. In this case, of the 3 output ciCS classes, only one illustrates the need for restoration actions (non-abiding"/ "unaltered" class). The other two classes express, in one case, abidance to the WFD Good Ecological Status (GES) target or a non-polluted/non-altered status; and in the other, uncertainty about the current status. This has relevant implications for the mapping analysis, the integration procedures and the overall definition of the restoration needs.

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Figure 12. Overlay of Surface Water Bodies (SWB) with River Restoration Units

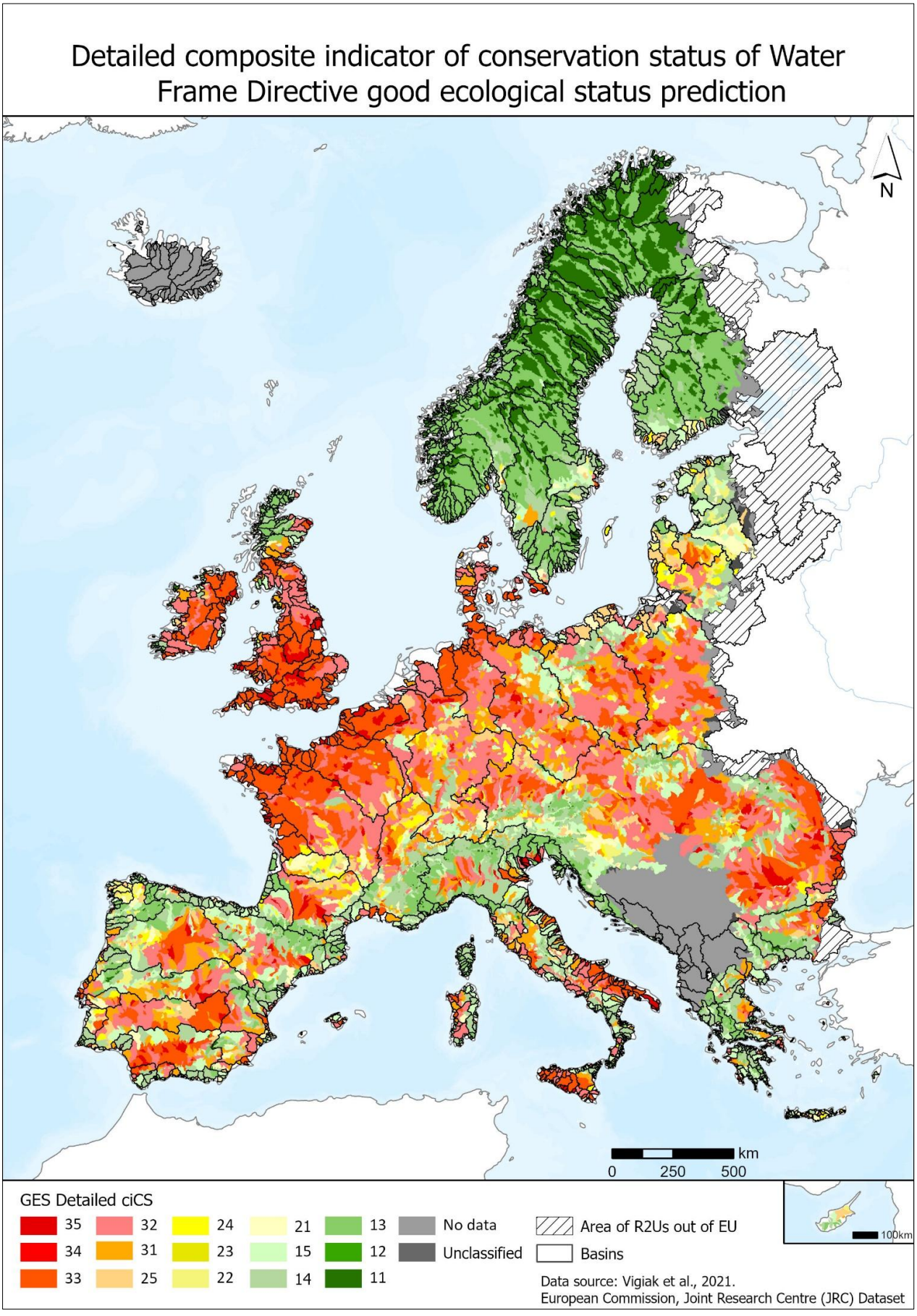


Figure 13. Water Framework Directive good ecological status detailed ciCS

Climate change projections

Data and Methods

Bioclimatic variables from WorldClim version 2.1 in 2.5 minutes spatial resolution have been used to project climatic change scenarios in River Restoration Units. In this section, we display firstly the mean annual air temperature calculated as the mean annual daily mean air temperatures in °C averaged over 1 year (BIO1). Secondly, we show the second bioclimatic variable shown is the accumulated precipitation amount in mm over 1 year (BIO12). The bioclimatic data are CMIP6 downscaled future climate projections in two Shared Socio-economic Pathways (SSP3-7.0 and SSP5-8.5) for the time period 2021-2040. The SSP3-7.0 scenario represents the medium to high end of plausible future forcing pathways indicating a forcing level common to several (unmitigated) SSP baseline pathways. The SSP5-8.5 scenario represents the high end of plausible future forcing pathways. Values of the bioclimatic variables have been given to River Restoration Units using the geoprocessing tool zonal statistics and data management tools to obtain all statistic types. Eventually, the mean values per R2U were chosen for the mapping.

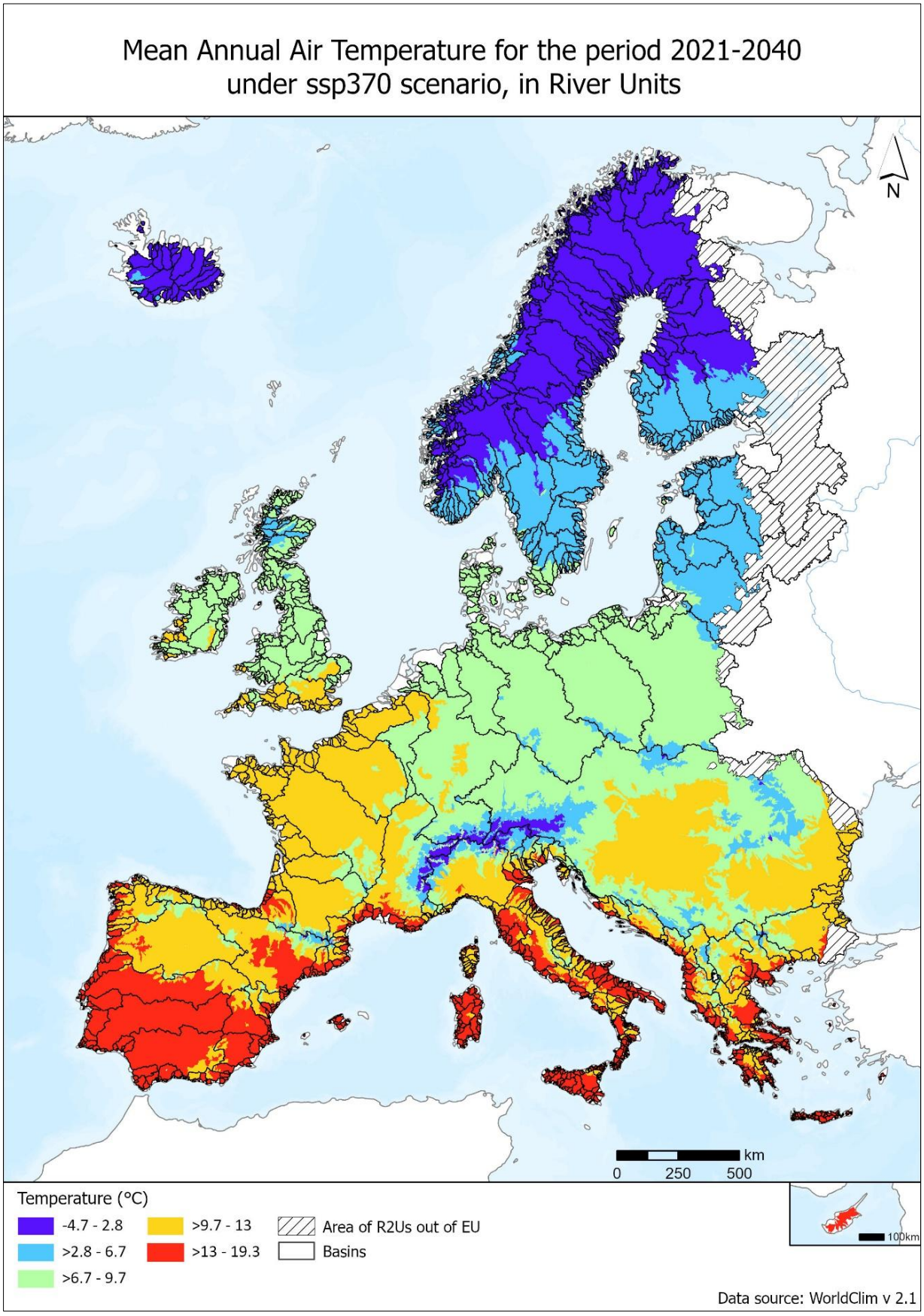


Figure 14. Mean annual air temperature (BIO1) 2021-2040 under the business-as-usual scenario (ssp370)

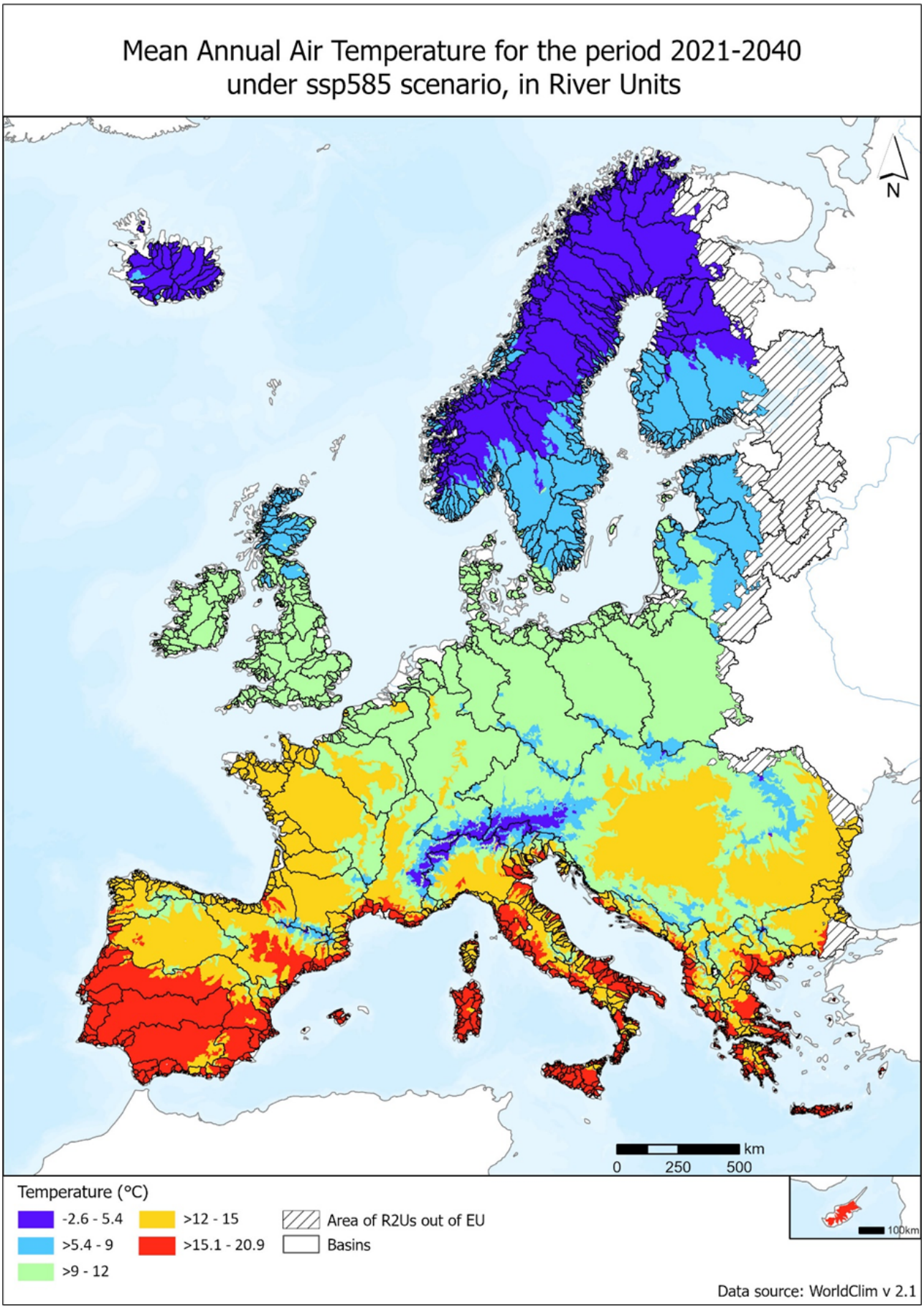


Figure 15. Mean annual air temperature (BIO1) 2021-2040 under the worst-case scenario (ssp585 scenario)

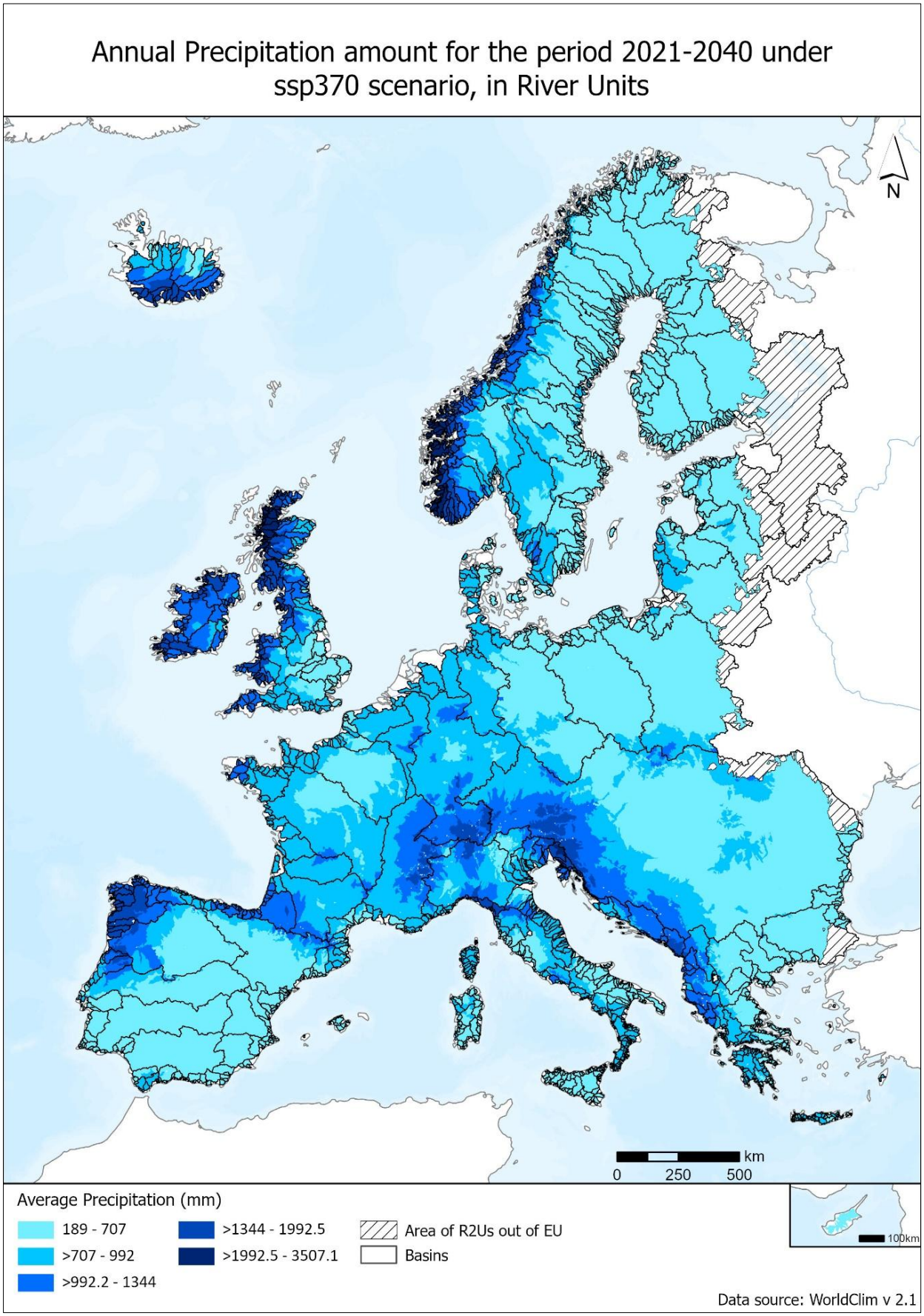


Figure 16. Annual precipitation amount (BIO12) 2021-2040 under the business-as-usual scenario (ssp370 scenario).

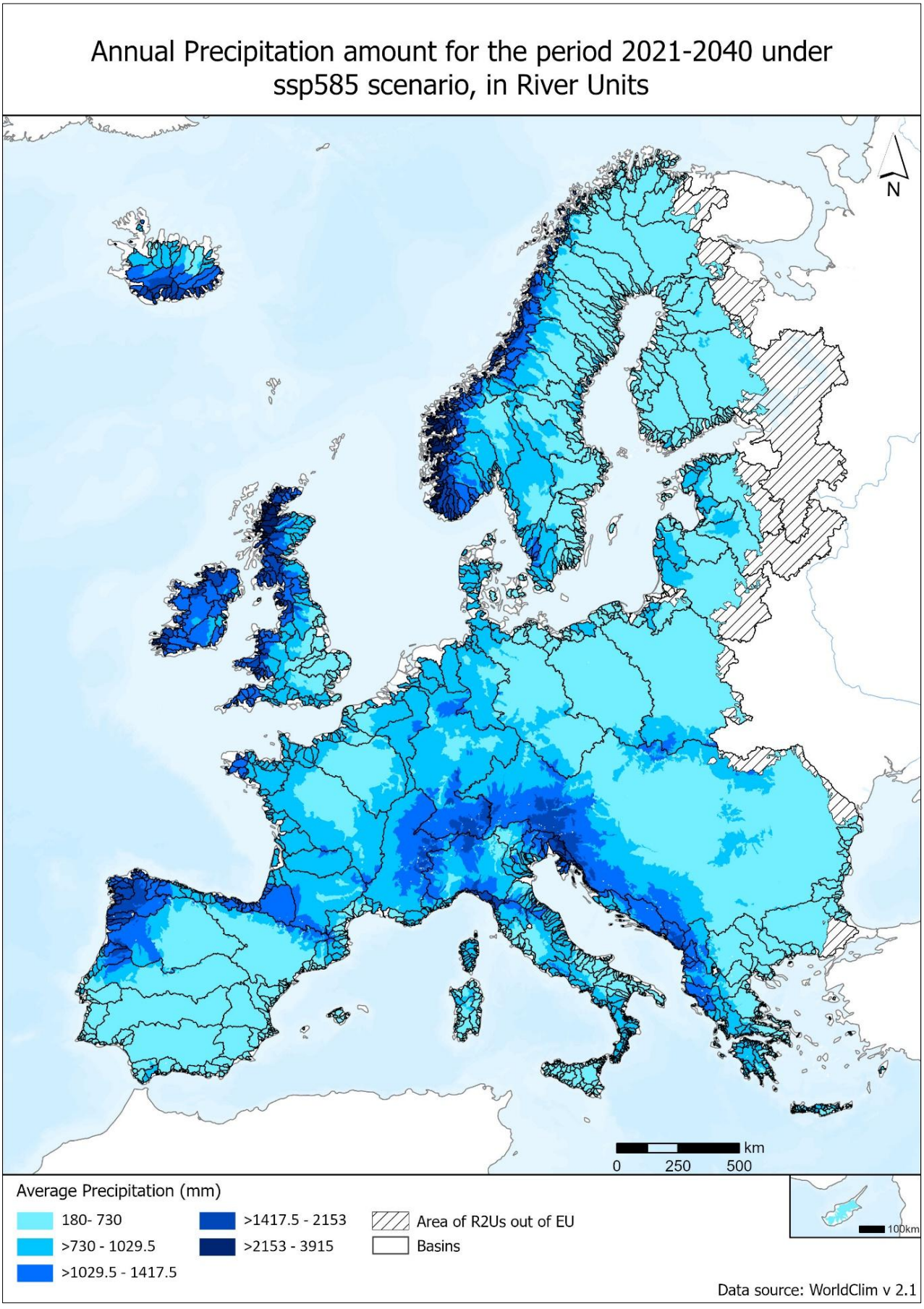


Figure 17. Annual precipitation amount (BIO12) 2021-2040 under the worst-case scenario (ssp585 scenario)

River connectivity and hydrological alterations

Data and Methods

To examine the river connectivity and the hydrological alterations within River Restoration Units barrier data, the data regarding the probability of altered morphology and hydrology produced by Vigiak et al. (2021), and the Aqueduct 3.0 Water Risk Projections have been used. Barrier information was compiled from several sources. The information about their location was mainly obtained from AMBER Barrier Atlas (AMBER Consortium, 2020), the Georeferenced Global Dams And Reservoirs (GeoDAR v1.1; Wang et al., 2021), and the GlObal geOreferenced Database of Dams (GOODD V1) (Mulligan et al., 2020). The geographic location of the dams was automatically integrated with the basin and R2U, and georeferencing inaccuracies/discrepancies were verified manually. Our approach to produce the artificial barriers database consisted of compiling available data from the global databases (listed above). First, we began by accessing the AMBER Barrier Atlas (AMBER Consortium, 2020). This inventory of barriers within European rivers is available online and, from these records, we selected barriers higher than 5 metres, which resulted in the collection of 9,835 georeferenced barriers in European basins (AMB). The Georeferenced Global Dams And Reservoirs (GeoDAR v1.1; Wang et al., 2021) holds 24,978 dam points worldwide. After selecting European barriers, we overlapped AMB and GeoDAR (GEO) data points. To clean the database, we began by setting a buffer distance between the previous AMB data points and the additional GEO data points, ranging from 250 m to 1500 m, guaranteeing unique dam locations and removing duplicate records at each distance interval of 250 m. GeoDAR points over the buffer distance of 1500 m were verified and confirmed to be new barrier records. This process resulted in a total increment of 2,262 GeoDAR barriers. The recently published GlObal geOreferenced Database of Dams (GOODD V1) (Mulligan et al., 2020), contains 38,667 dam points (2,760 in Europe) digitised from Google Earth imagery and their associated catchments delineated from digital elevation models (DEMs) (GDD). The following step was to select European barriers, overlap the previous data (AMB and GEO) with GDD data points, and clean the database by removing duplicate records repeating the same process as before, using again a buffer distance limit of 1500 m between data points (AMB_GEO point to GDD point). GDD duplicated points under the buffer limit were removed. GDD points within a 1500 to 3000 m range distance were verified manually, at each distance interval of 250 m, eliminating duplicates. Points above the 3000 m buffer limit were confirmed to be unique barriers. Through this selective process, we were able to add a total of 481 GOODD barriers to the dataset. Several supporting sources, such as Google Earth imagery, were used to visually verify and validate the spatial location of the dams, and respective river network segments. After quality checking, we harmonised records reaching a total of 12,578 compiled barriers, which affect 8,524 segments of the European river network.

The methodology to examine the hydrological alterations within the River Restoration follows the applied methodology for the modelled Water Framework Directive data. The used Aqueduct 3.0 Water Risk Projections include indicators of change in water supply, water demand, water stress, and seasonal variability, projected for the year 2040 under the CMIP5 climate scenarios; RCP4.5 and RCP8.5, and the shared socioeconomic pathways; SSP2 and SSP3. The SSP2 RCP8.5 scenario represents the business-as-usual scenario indicating stable economic development and a stable rise of global carbon emissions, with concentrations of CO_2 to reach ~1370 ppm by 2100 and the global mean temperatures to increase by 2.6–4.8°C relative to 1986–2005 levels. The SSP3 RCP8.5 scenario represents the pessimistic scenario indicating a worldwide uneven economic development, with increased population growth, decreased GDP growth, and a lower rate of urbanization, all of which potentially affect water usage; and steadily rising global carbon emissions, with concentrations of CO_2 to reach ~1370 ppm by 2100 and the global mean temperatures to increase by 2.6–4.8°C relative to 1986–2005 levels. Values of the Water Risk Indicators have been given to River Restoration Units using the geoprocessing tool zonal statistics and data management tools to obtain all statistic types. The mean values per R2U are represented in the mapping.

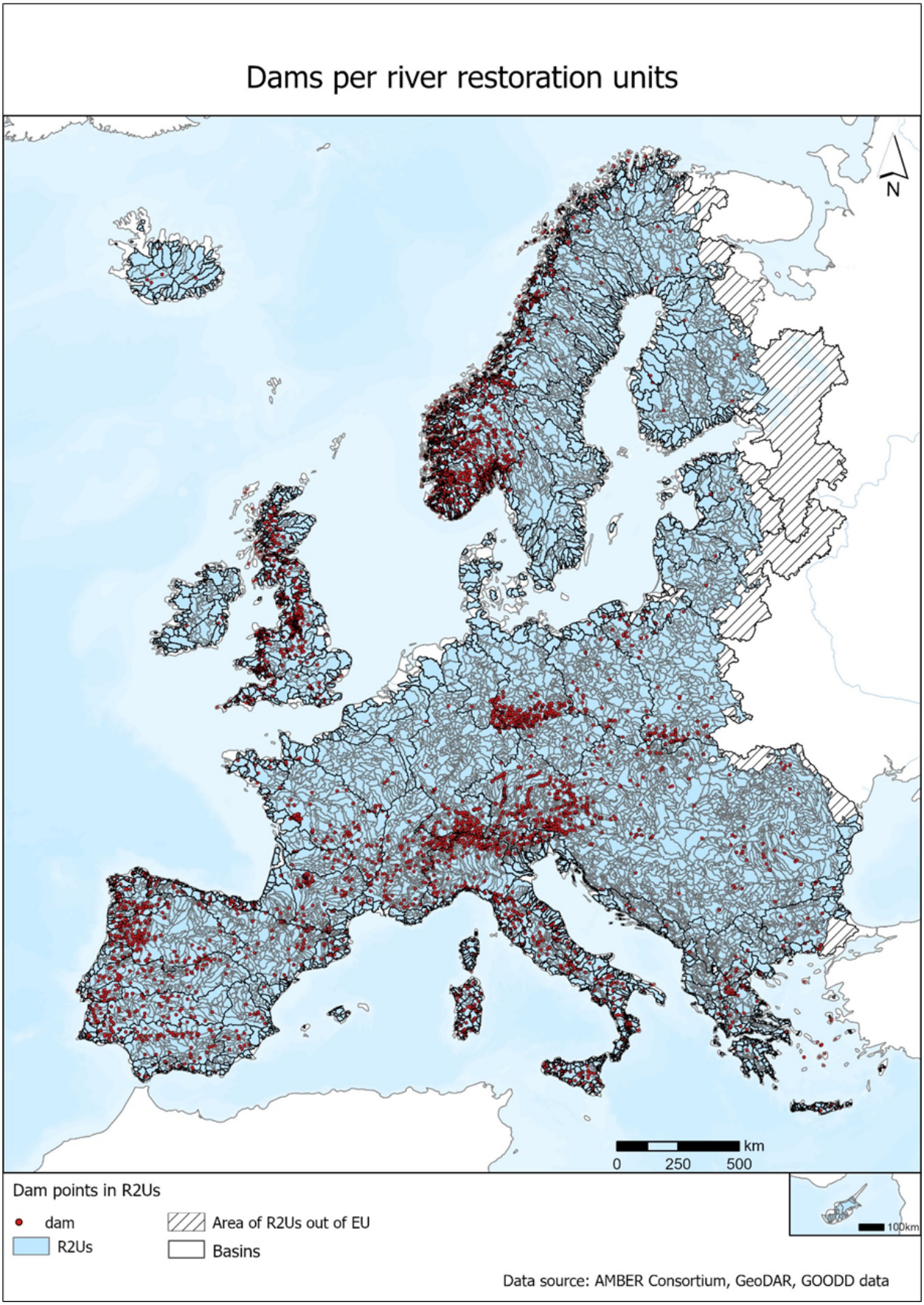


Figure 18. Overlay of dam point in River Restoration Units

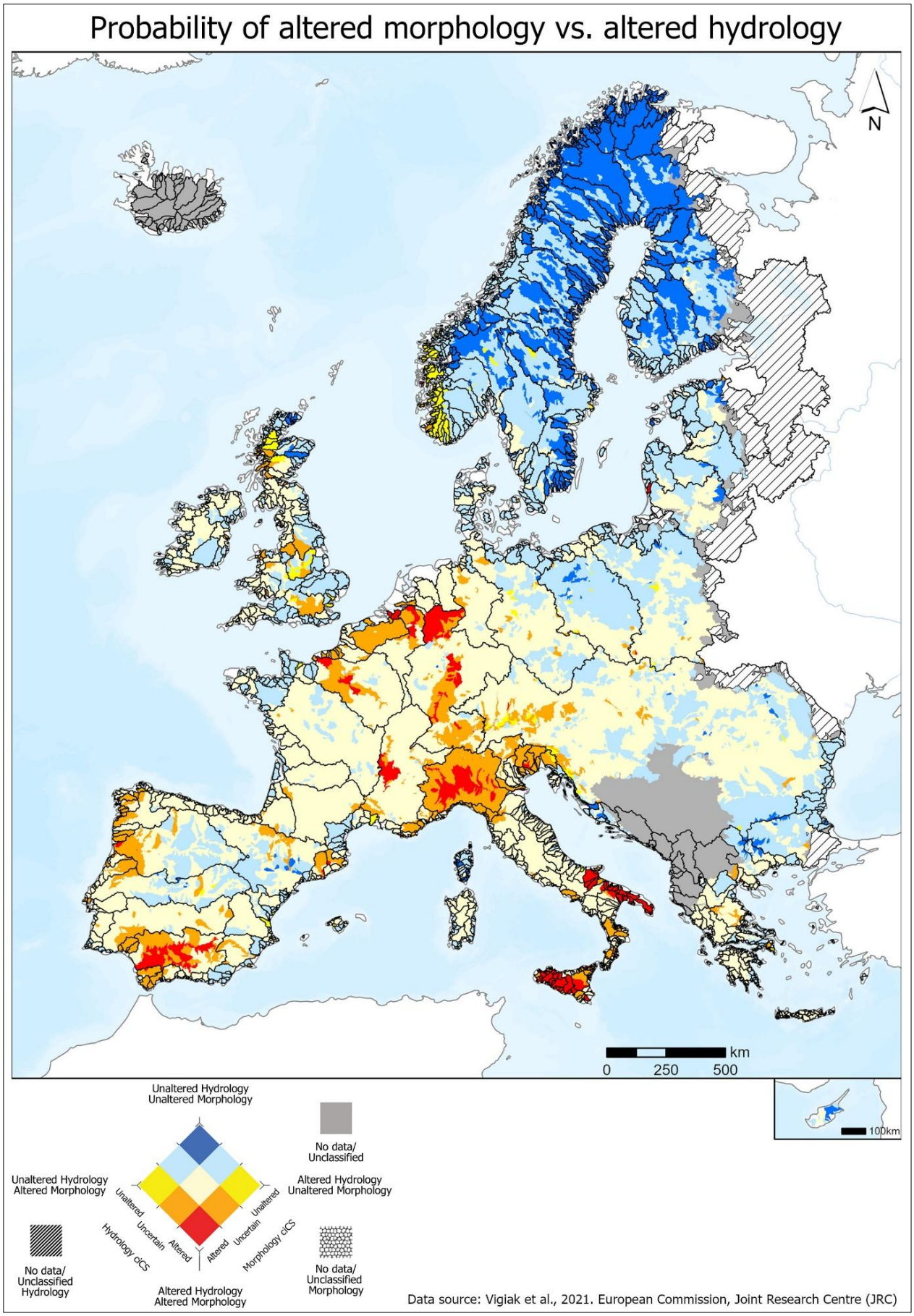


Figure 19. Probability of altered morphology vs. altered hydrology

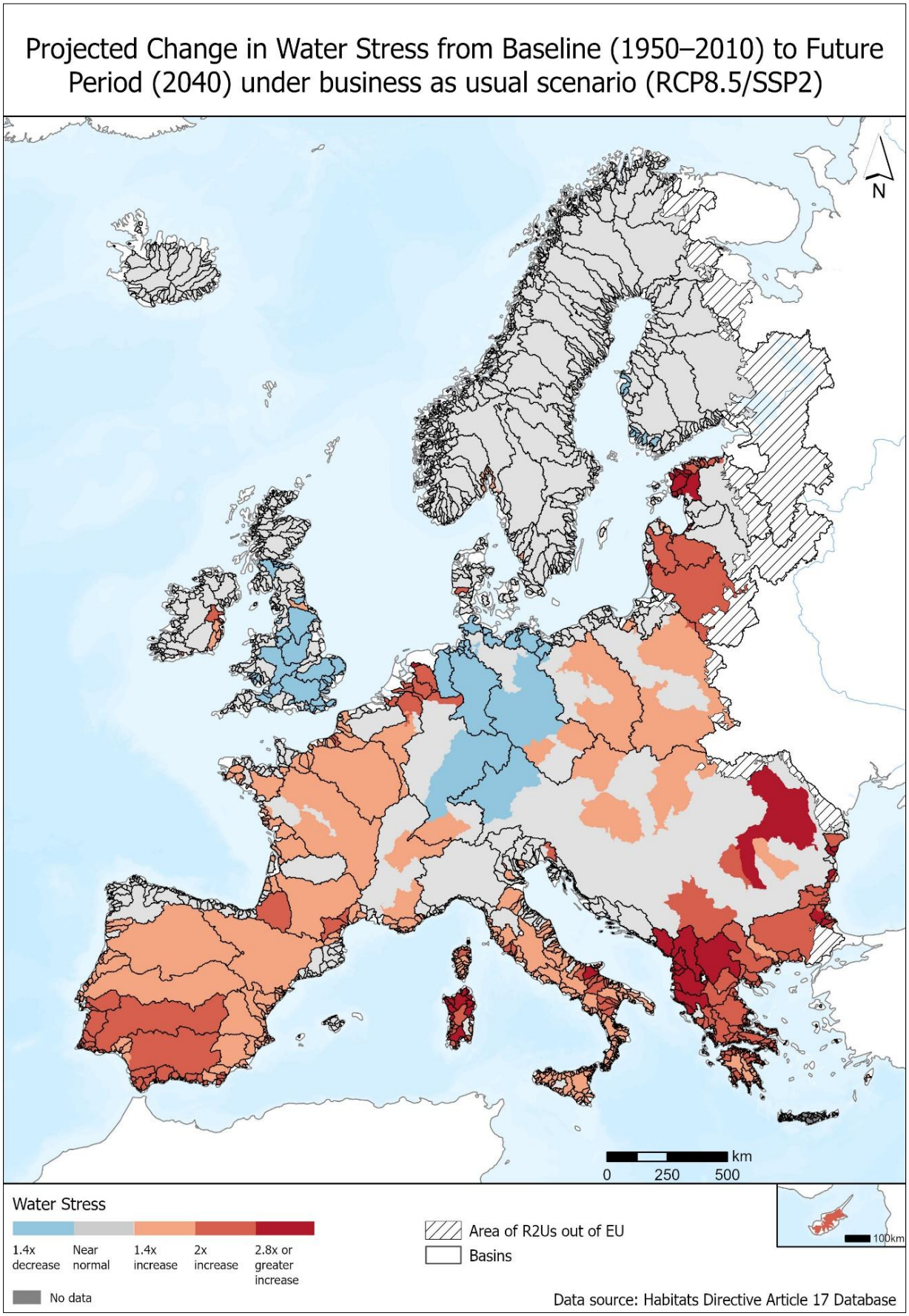


Figure 20. Projected Change in Water Stress under business-as-usual scenario (RCP8.5/SSP2) for the year 2040

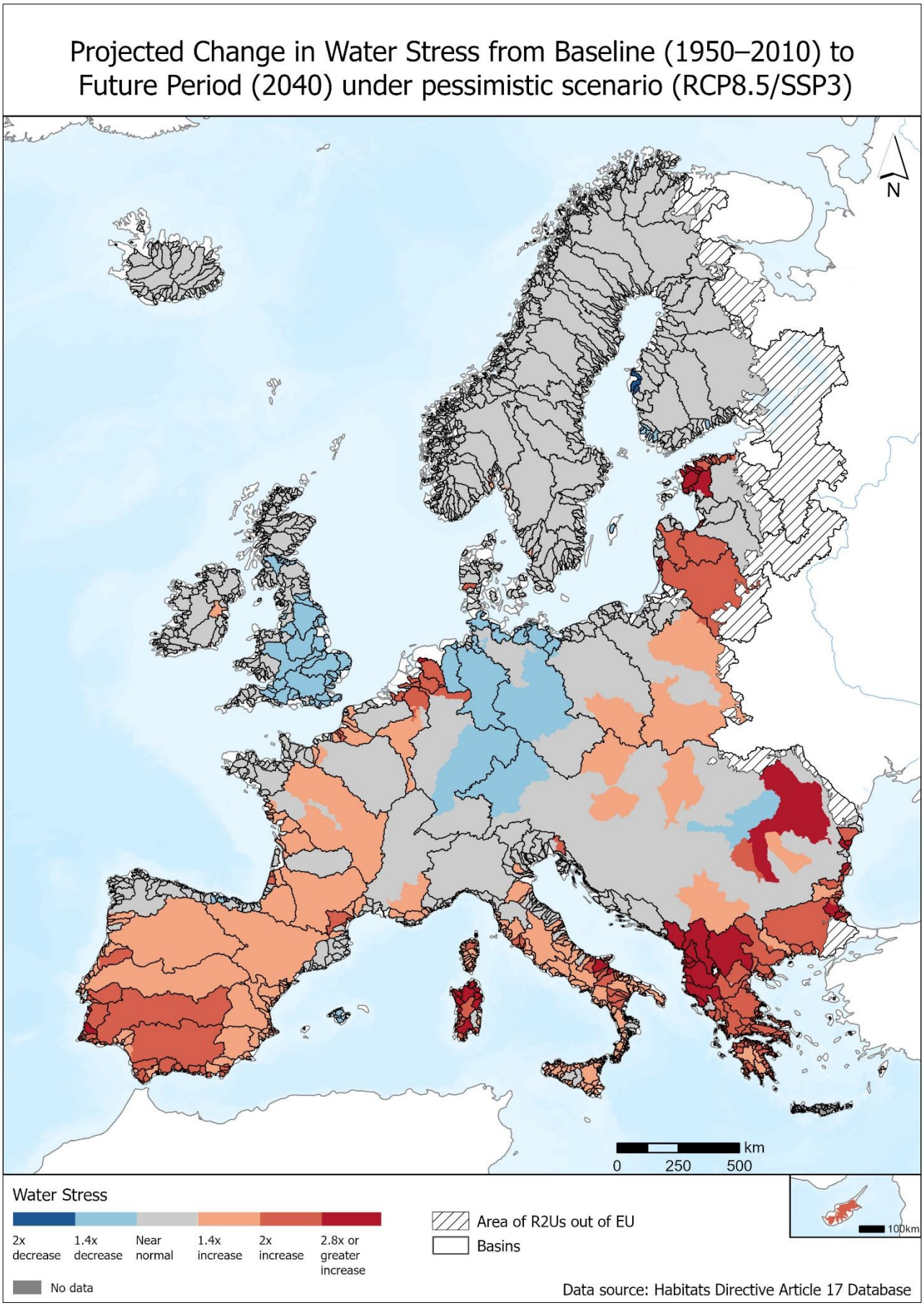


Figure 21. Projected Change in Water Stress under pessimistic scenario (RCP8.5/SSP) for the year 2040

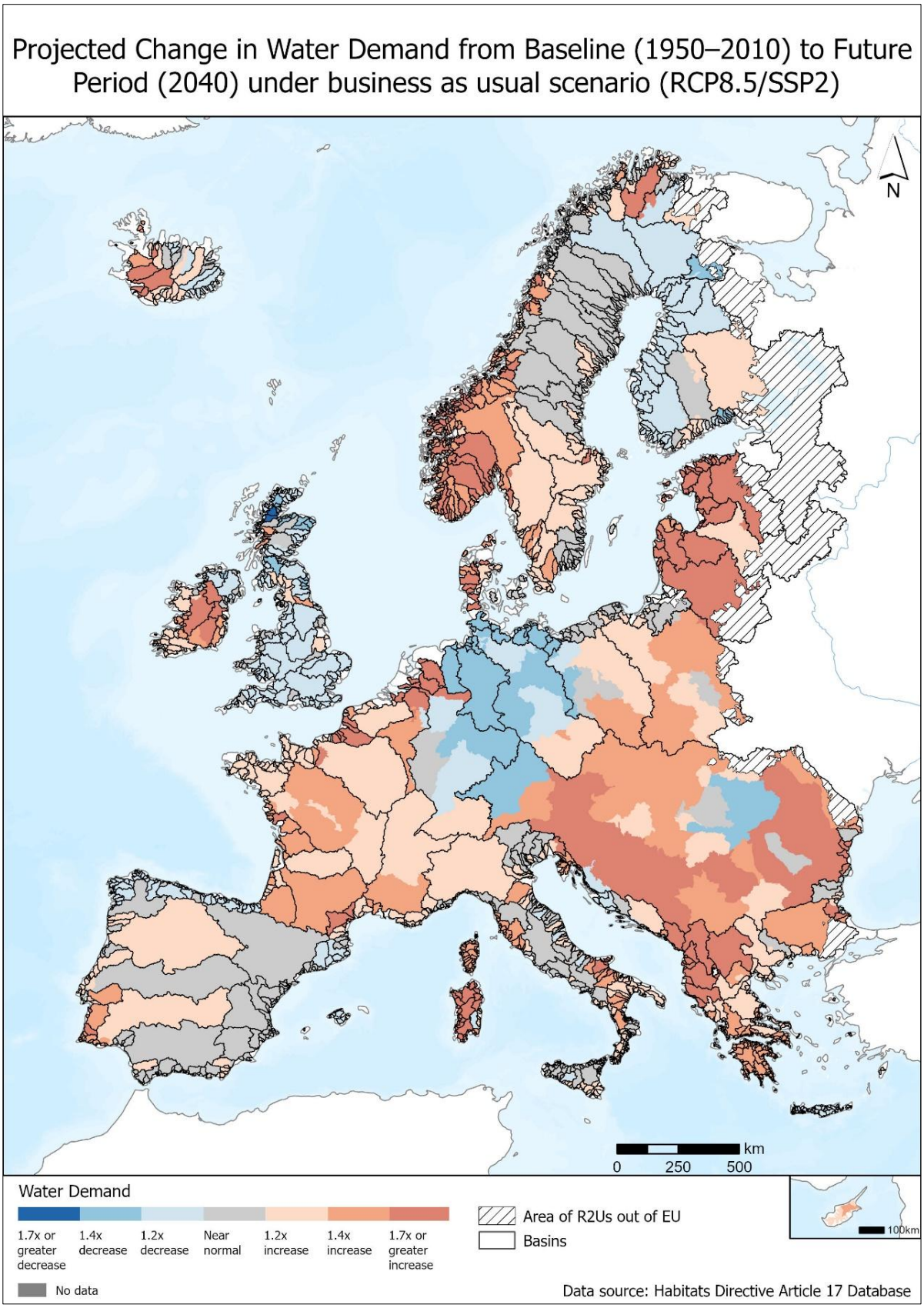


Figure 22. Projected Change in Water Demand under business-as-usual scenario (RCP8.5/SSP2) for the year 2040

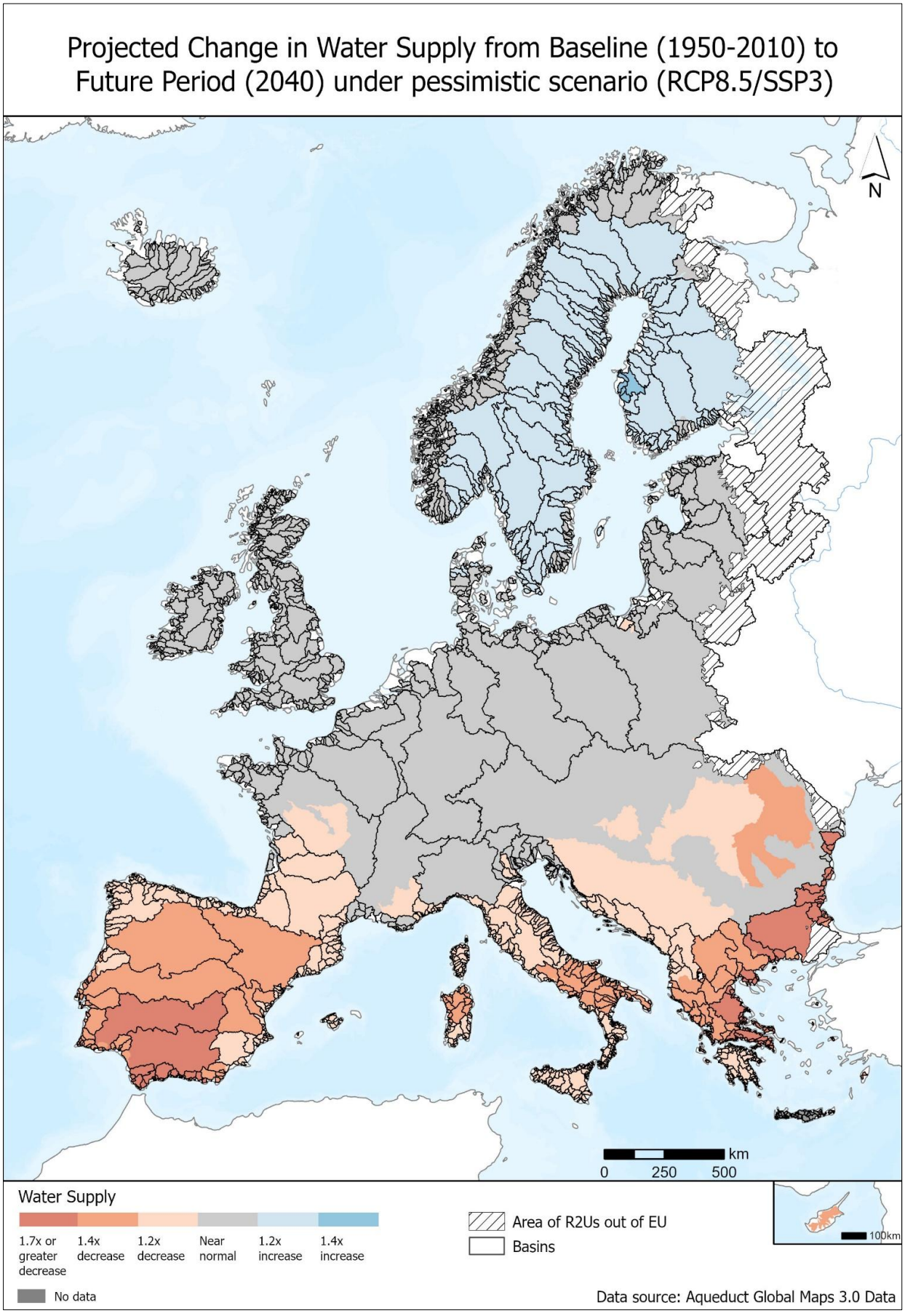


Figure 23. Projected Change in Water Stress under pessimistic (RCP8.5/SSP3) for the year 2040

Restoration Needs

Data and Methods

The restoration needs were determined by integrating the non-abidance of both Habitats and Water Framework Directives at the R2U level. To achieve this, the R2Us classification was used, which was previously done for the "integrated composite indicator of conservation status of freshwater related protected habitats and species under Habitats Directive" and the "Composite indicator of conservation status of Water Framework Directive good ecological status prediction." The integration was accomplished through a bivariate choropleth map, which then resulted in a simplified reclassification into "Compliance" (abiding both directives), "Partial compliance" (abiding to one directive) "Partial needs" (not abiding to one directive), "Needs" (not abiding to both directives) and "Unknown". Whenever restoration needs (directive non-abidance) existed coming from one of the directives that was the prevailing term. The "Partial" terminology derived also from having R2Us without data for one of the directives.

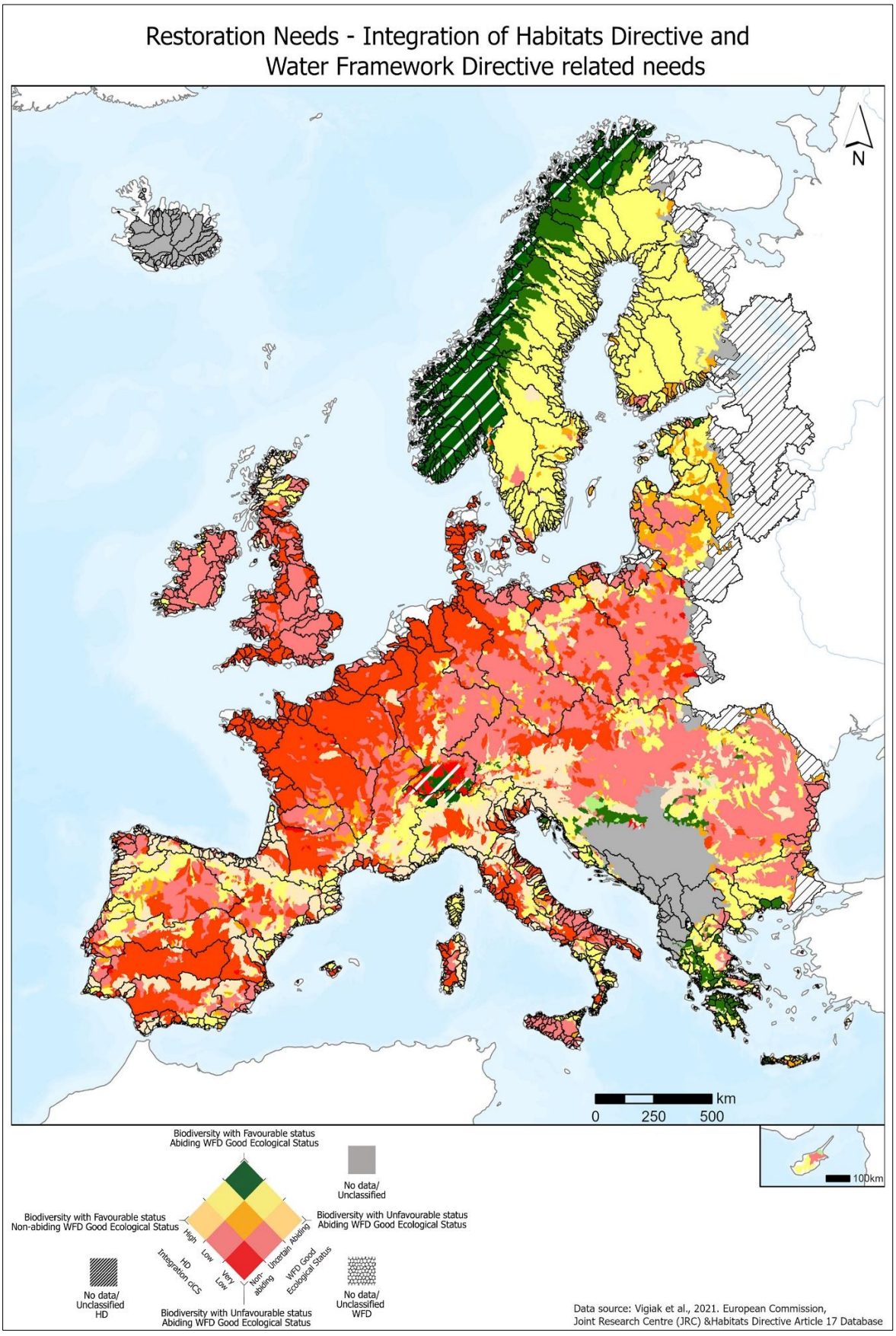


Figure 24. Integration between HD Needs and WFD Needs

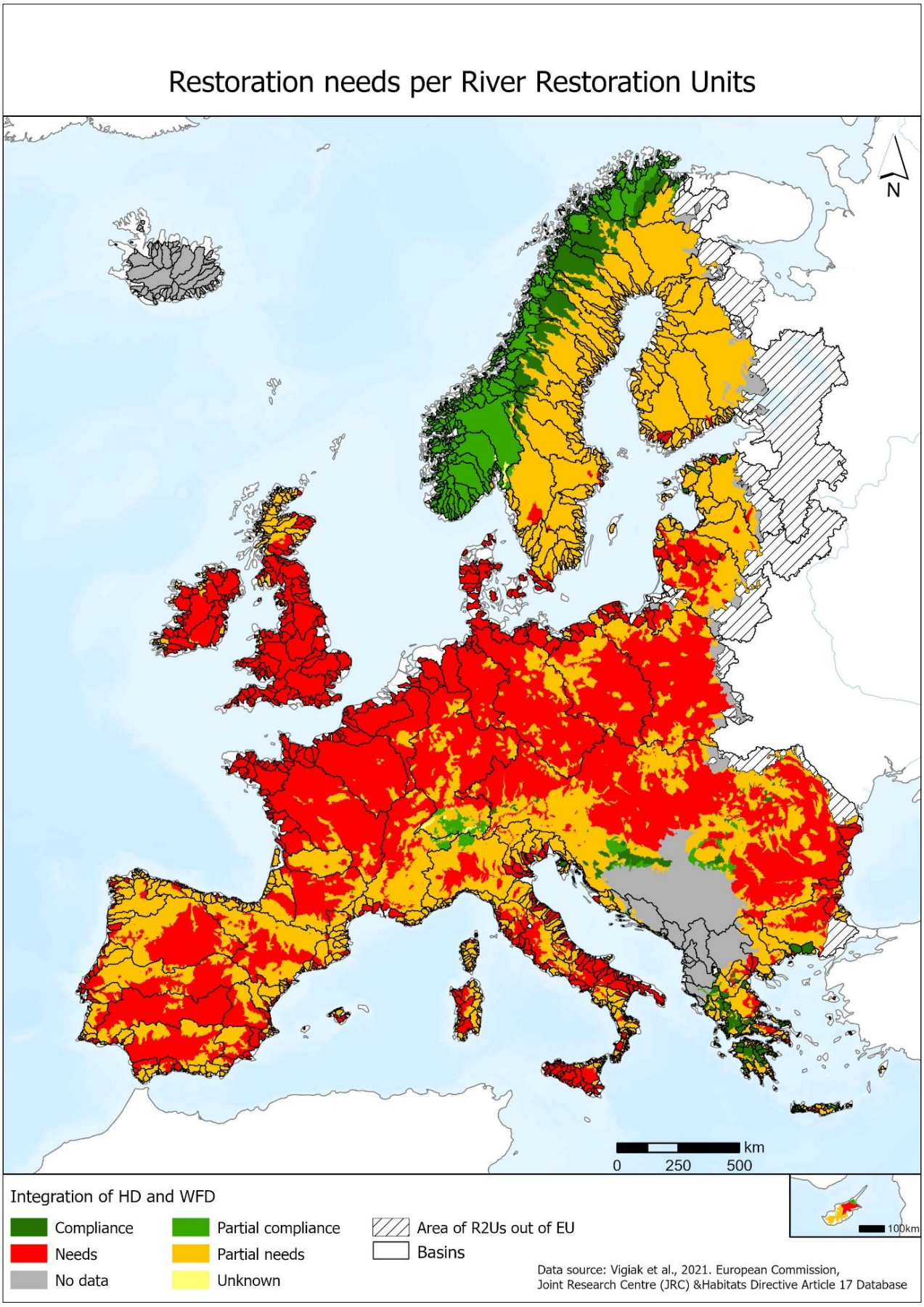


Figure 25. Integration between HD Needs and WFD Needs with reclassified classes

5 Part II – Mapping restoration potential

Ecosystem Services Assessment Indicator

Data and Methods

To create the Ecosystem Services Assessment Indicator, we used data from the ecosystem accounting framework of the Integrated Natural Capital Accounting (INCA) project and the EUROPEAN SOIL DATA CENTRE (ESDAC), using Multi-Criteria Decision Analysis (MCDA) coupled with GIS. According to INCA approach the ecosystem services (ES) are valued and assessed based on the:

- **Ecosystem services demand** defined as "*the need for specific ecosystem services by society, particular stakeholder groups or individuals*".
- **Ecosystem services potential** representing what ecosystems can provide, independently whether there is an ES demand or not. It measures and maps the supply from the ecosystem side that eventually becomes actual flow/use once it interacts with the ES demand.
- **Ecosystem services use/ actual flow** when the ES potential matches with the ES demand.
- When there is mismatch between ES potential and ES demand, three types of mismatch are generated based on the ES type: **the ES missed flow** indicating the gap between what could be currently provided and what is effectively provided (the gap between the whole ES potential and the ES actual flow), **the ES overuse** occurring where the use of ES exceeds its regeneration or absorption rates, and **the ES unmet demand** taking place where there are no ecosystems to provide the ES that are needed by the ES demand.

MCDA is a process that allocates areas on the basis of a variety of criteria that the selected areas should possess. In other words, MCDA permits the assessment of an area based on multiple objectives and criteria supporting decision-making. In this application, the MCDA starts by selecting the ecosystem services (criteria) to be used, their spatial extent, and their weights as follows:

- The Crop Pollination Potential in floodplains area for the maximum return period (500 years). "*The assessment of pollination potential is based on an indicator of the environmental suitability to support wild insect pollinators. The environmental suitability is, then, used to delineate service providing areas (SPA) showing a different level of pollination potential: high, medium, low, and none.*"
- The Water Purification Demand in R2Us. The water purification demand is measured as the total nitrogen input from diffuse and point sources in the catchment in tonnes per hectare. Lower values indicate less demand for purification.
- The Flood Control unmet demand in floodplains for the maximum return period (500 years). "*The unmet demand quantifies the part of the demand (economic assets) that is not protected by ecosystems in the whole upstream basin.*" "*If an extreme rain episode occurred, areas of unmet demand would be more likely to flood.*" Values are in hectares. Lower values indicate smaller areas prone to floods.
- The Soil Retention unmet demand in floodplains for the maximum return period (500 years). "*Where the soil erosion rate exceeds the soil formation rate, the protective role of vegetation is not enough, leading to the degradation of the ecosystem condition. In this case, the net soil losses represent the ES unmet demand for soil retention. This is calculated as the difference between the soil erosion and soil formation rates.*" Values are in tonnes per hectare. Lower values indicate less net soil losses.
- The Soil Organic Carbon (SOC) saturation capacity (ESDAC) in R2Us has been used as a proxy to Carbon Sequestration. The SOC is "*expressed as the ratio between the actual and the potential SOC stock. Values close to 0 indicate a great potential of soil to store more carbon.*"

The next step was the transformation of the derived raster layers related to the above-selected ES into 0 to 1 scale using raster calculator and fuzzy membership based on linear transformation. Raster values were inverted when necessary to maintain an equal negative signal in all criteria (ES).

Synthesizing the Ecosystem Services Assessment Indicator, we sum all ES using cell statistics, ignoring the No data cells in the calculation, divided by the number of ES present using raster calculator.

Using zonal statistics and data management tools average values of each ES have been assigned to R2Us with the exception of Crop pollination where the majority values was used. Similarly, average values of the Ecosystem Services Assessment Indicator were given to R2Us. Higher values indicate areas with less ES present or higher demand.

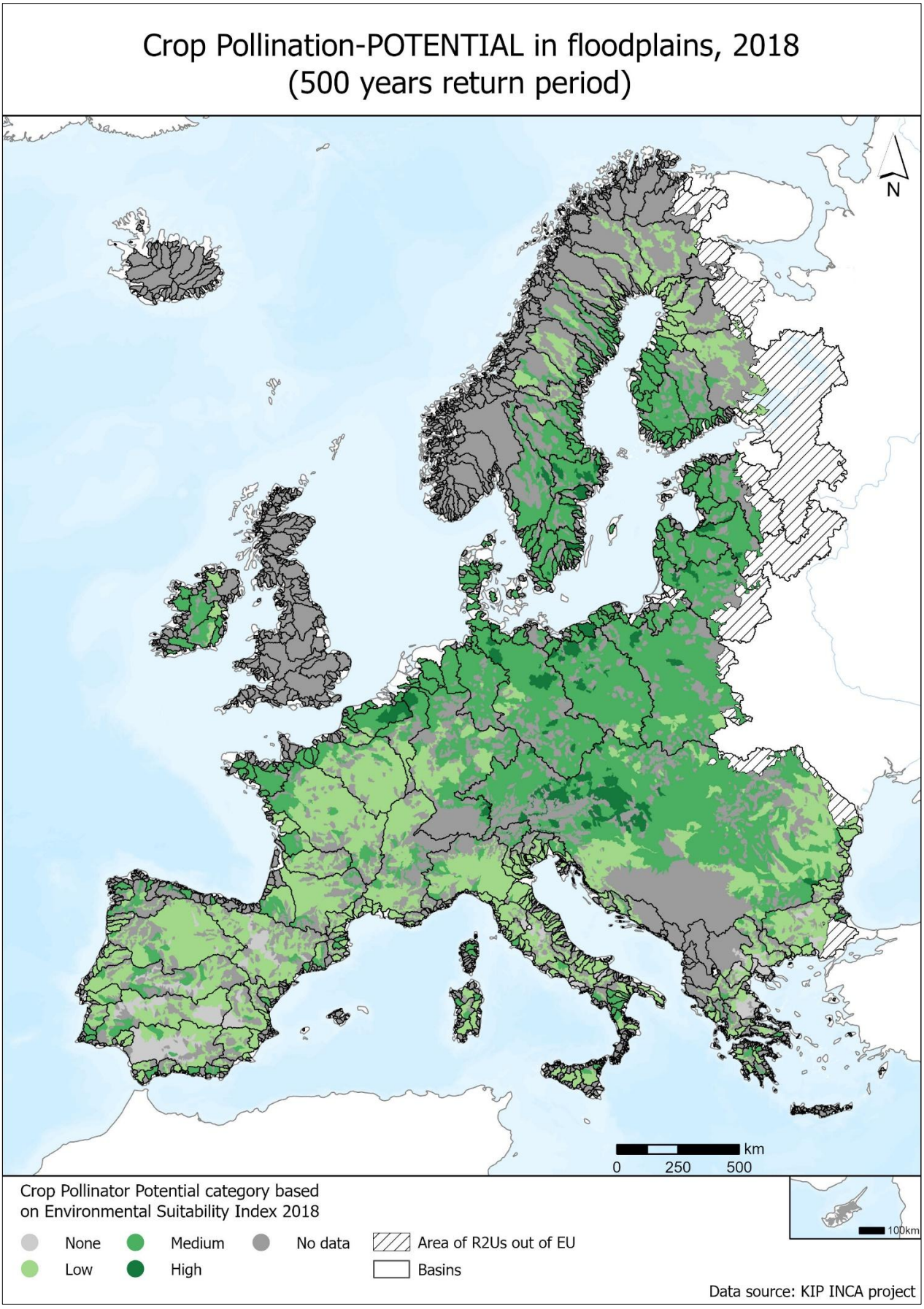


Figure 26. Crop Pollination Potential for the year 2018

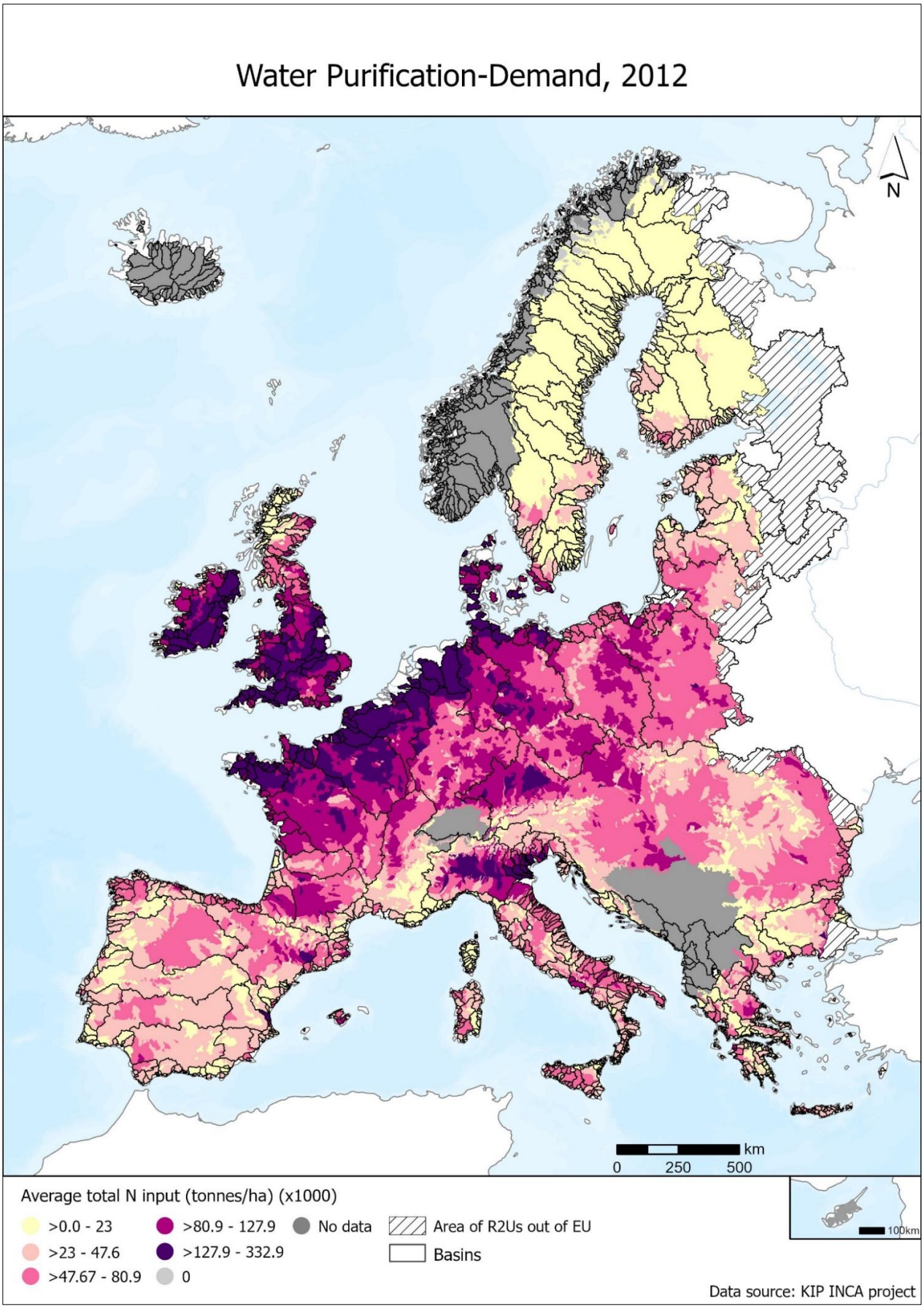


Figure 27. Water Purification Demand for the year 2012

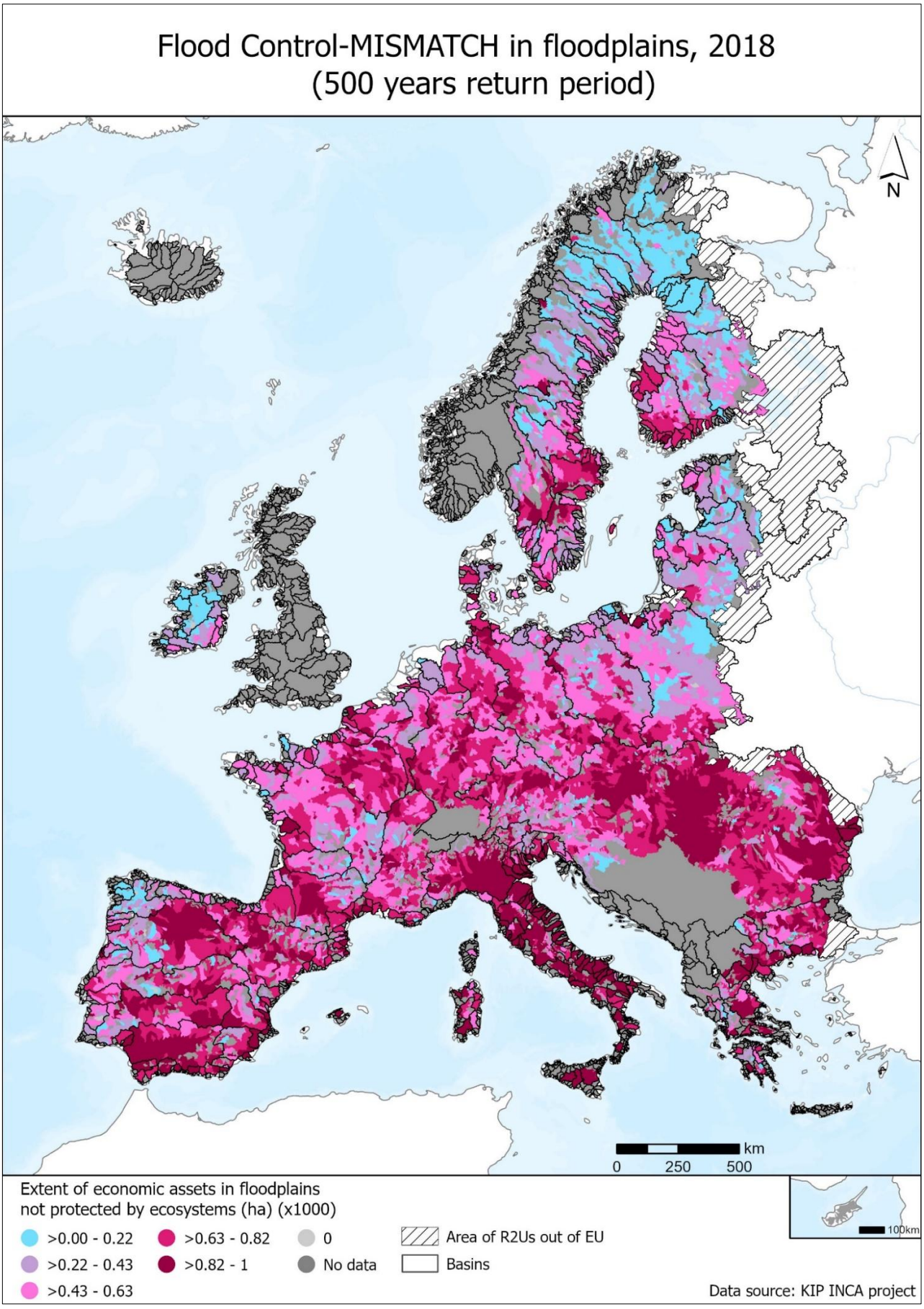


Figure 28. Flood Control Unmet Demand for the year 2018

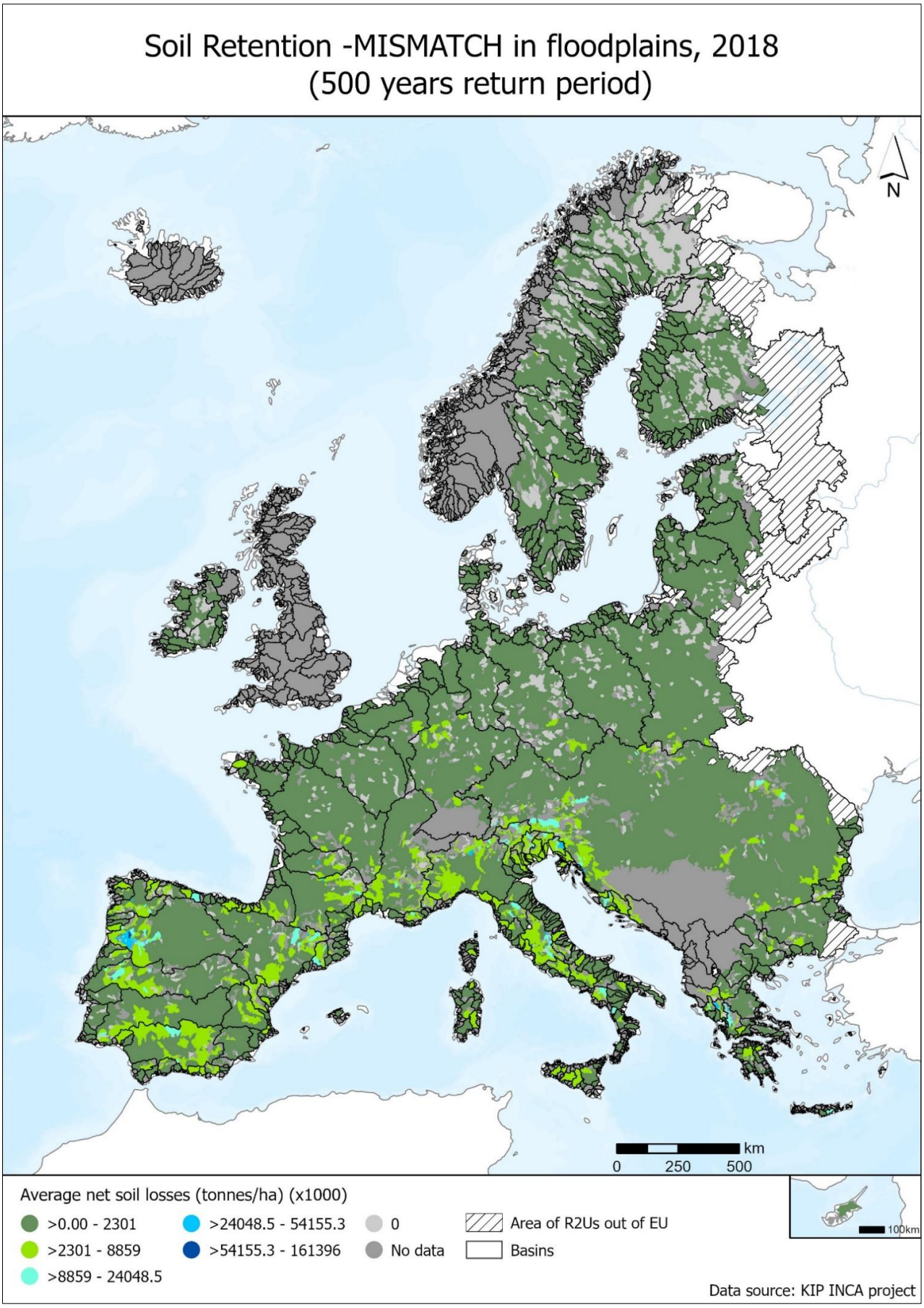


Figure 29. Soil Retention Unmet Demand for the year 2018

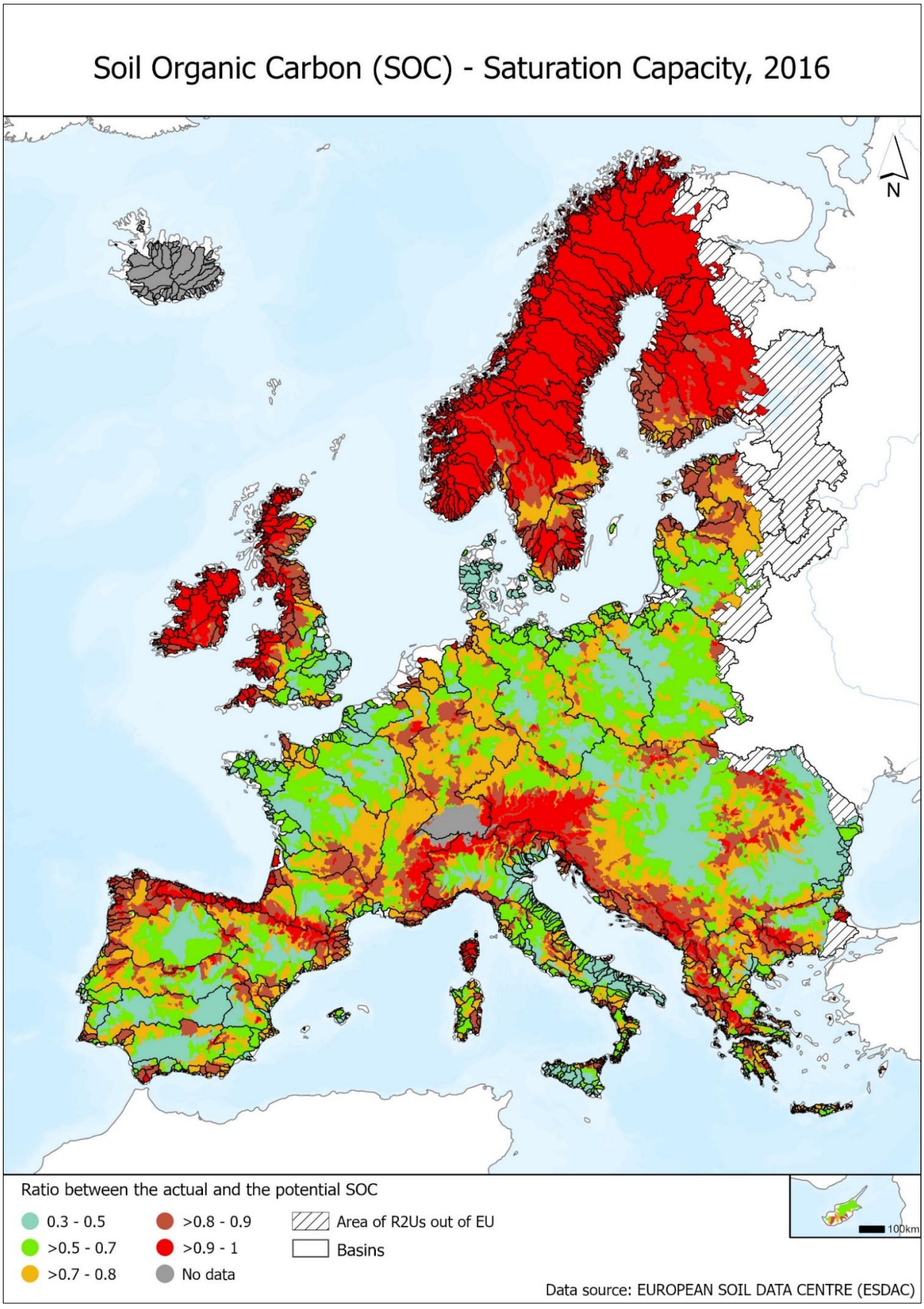


Figure 30. Soil Organic Carbon- Saturation Capacity for the year 2016

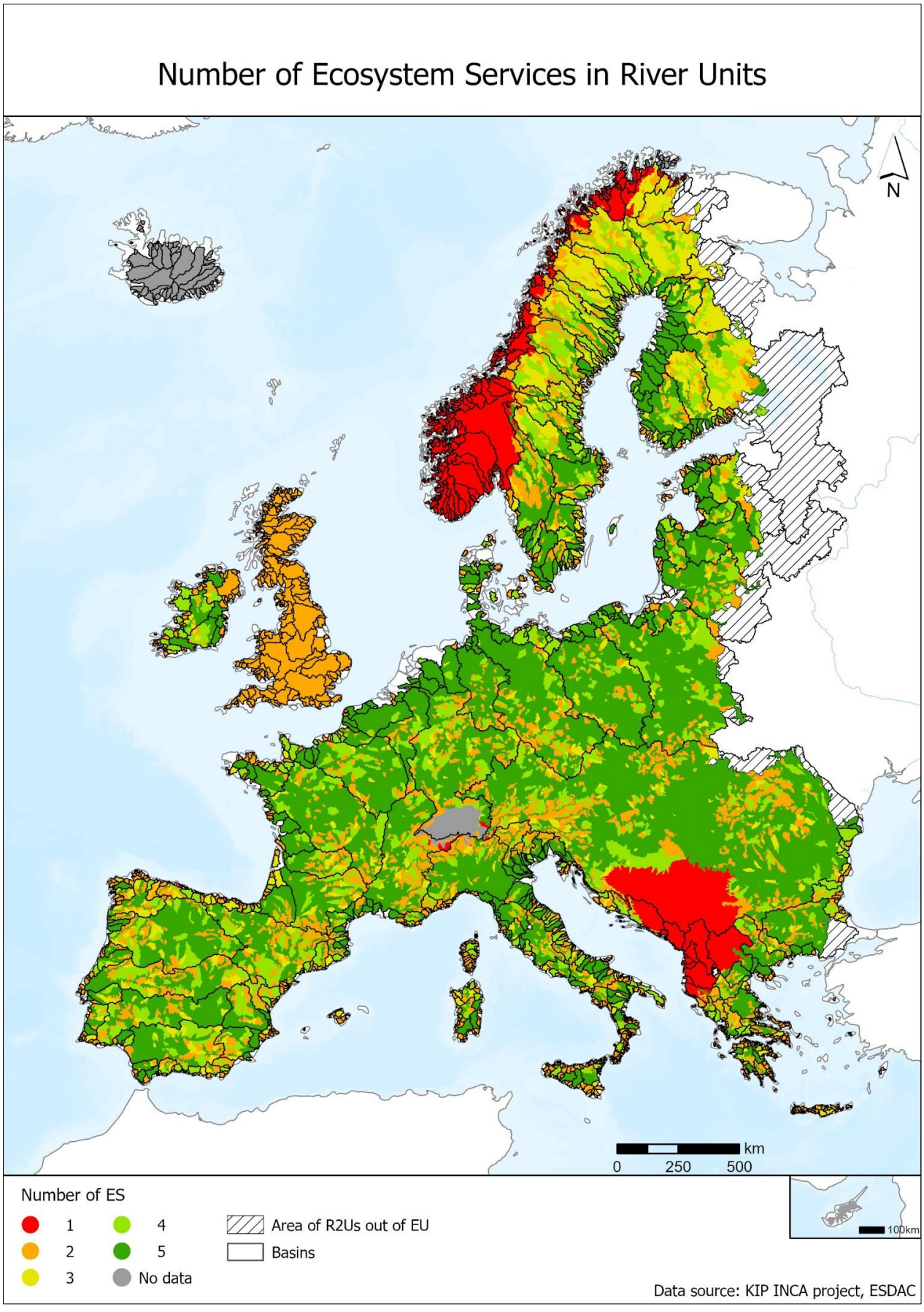


Figure 31. Number of Ecosystem Services under analysis in River Restoration Units

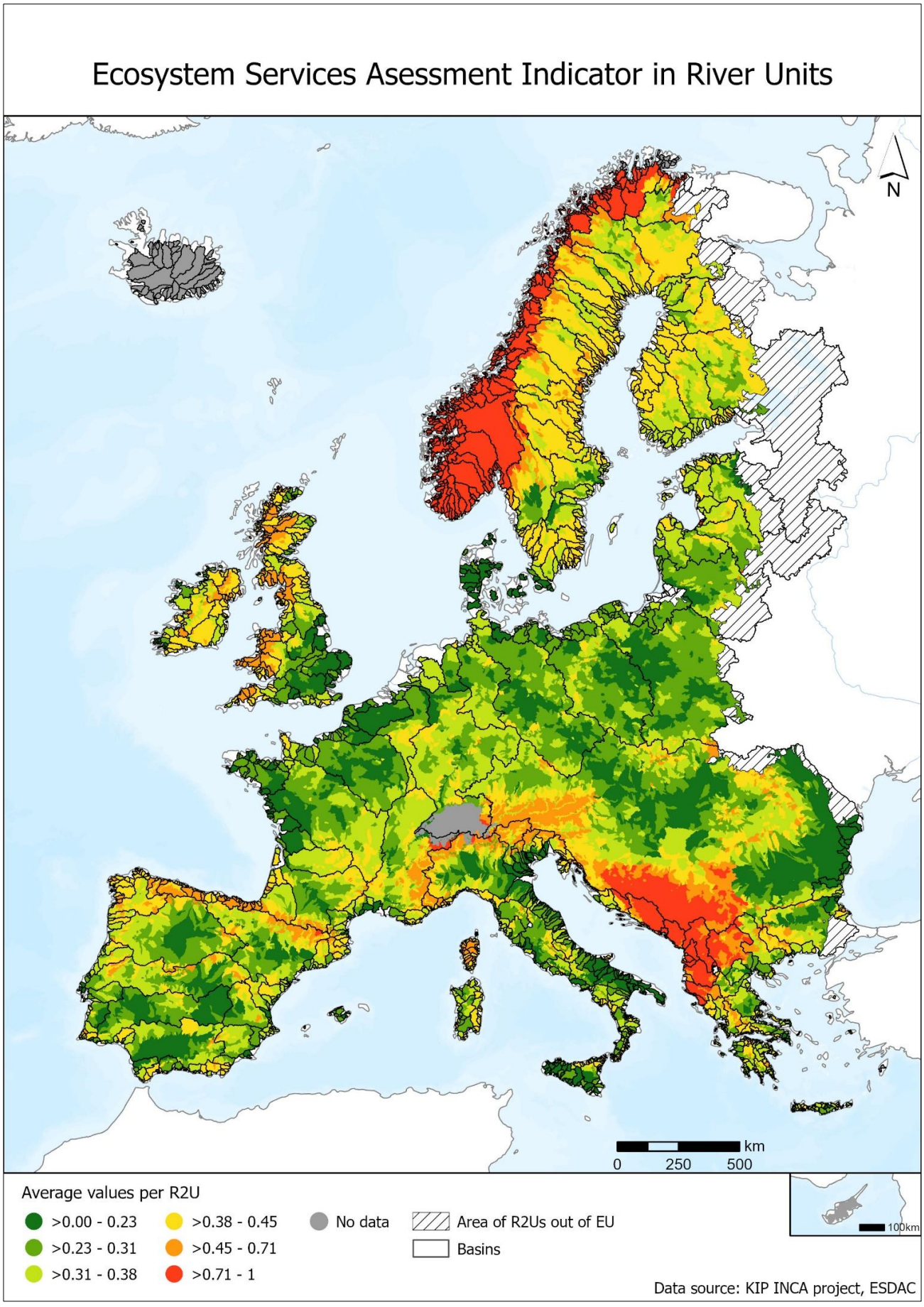


Figure 32. Ecosystem Services Assessment Indicator

Constraints to restoration

Data and Methods

The 2009 Human Footprint data of the Last of the Wild, v3 2018 released in 2018 from Venter et al. has been used as a proxy for all constraints to restoration. "*This dataset provides a global map of the cumulative human pressure on the environment, at a spatial resolution of ~1 km. The human pressure is measured using eight variables including built-up environments, population density,* electric *power infrastructure, crop lands, pasture lands, roads, railways, and navigable waterways*." Values of the Human Footprint have been given to River Restoration Units using the geoprocessing tool zonal statistics and data management tools to obtain all statistic types. Eventually, the mean values per R2U were chosen for the mapping.

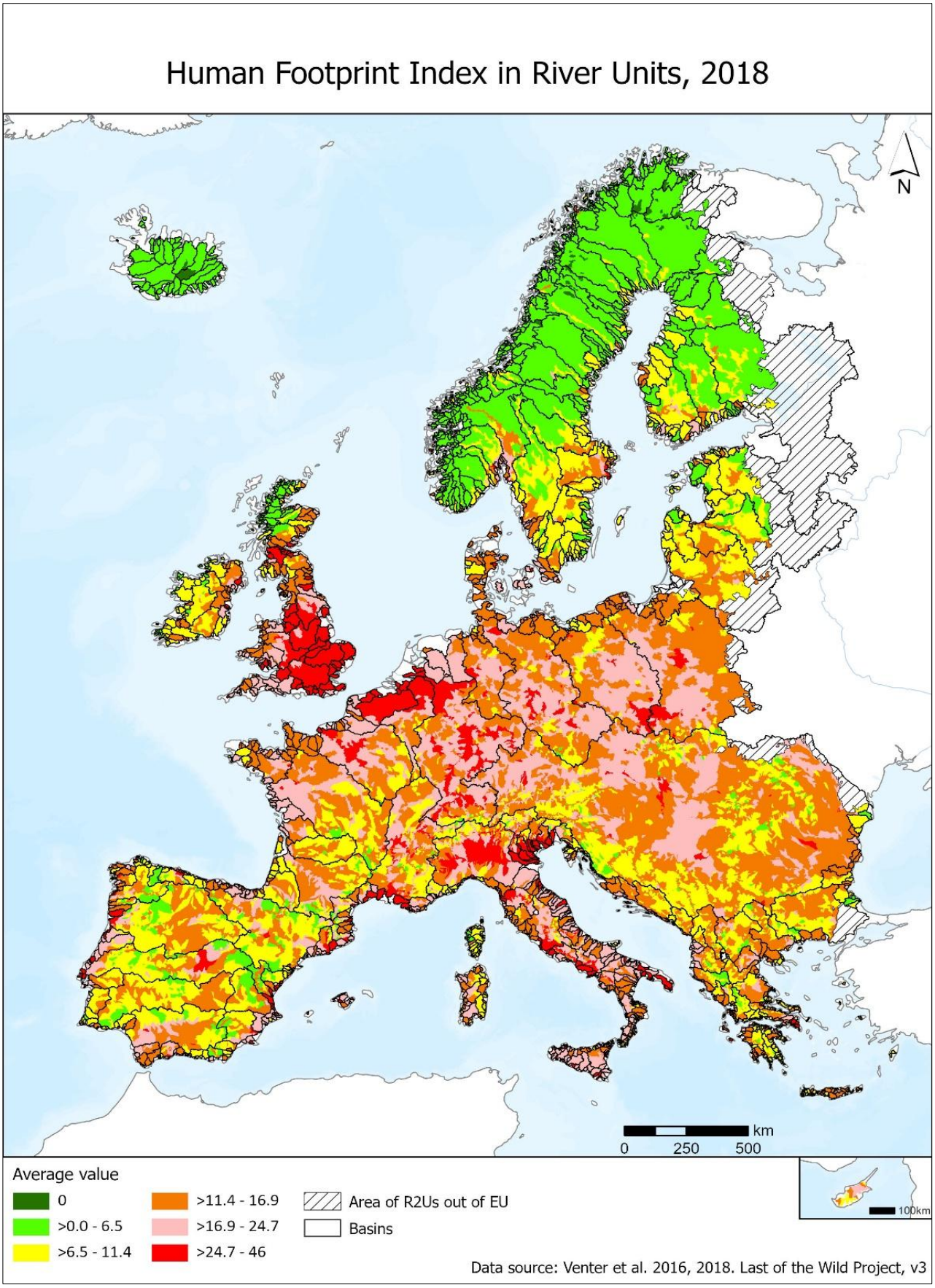


Figure 33. Human Footprint in River Restoration Units

Enablers to estoration

Data and Methods

Restoration actions towards improving freshwater ecosystems must occur in areas where these ecosystems are present. Moreover, in those areas where freshwater ecosystems are included in nature 2000 areas, implementing restoration actions is facilitated not only by legal protections but also commonly by a lesser degree of human presence. Considering this, areas where Natura 2000 sites intersect floodplains, or where it intersects wetlands outside floodplains were considered passive enablers of restoration actions. To locate these areas we used the dataset of the Natura 2000 protected sites (https://www.eea.europa.eu/data-and-maps/data/natura-14), complemented by the UK Protected Area Datasets (https://jncc.gov.uk/our-work/uk-protected-area-datasets-for-download/), the datasets of Dotorri et al. (2021) on the flooded areas with a return period of 500 years (https://data.jrc.ec.europa.eu/dataset/1d128b6c-a4ee-4858-9e34-6210707f3c81) and the Extended wetland ecosystem layer 2018 (https://sdi.eea.europa.eu/catalogue/idp/api/records/de2d0d77-a389-49d0-84d7-73a29046823f). Using a series of spatial operations we determined the area within the floodplain protected by Nature 2000 sites plus the areas outside of floodplains that coincides with wetlands that are protected by Nature 2000 sites, and represented this as a percentage of the R2U.

Reference

Dottori, Francesco; Alfieri, Lorenzo; Bianchi, Alessandra; Skoien, Jon; Salamon, Peter (2021): River flood hazard maps for Europe and the Mediterranean Basin region. European Commission, Joint Research Centre (JRC) [Dataset] doi: 10.2905/1D128B6C-A4EE-4858-9E34-6210707F3C81 PID: http://data.europa.eu/89h/1d128b6c-a4ee-4858-9e34-6210707f3c81

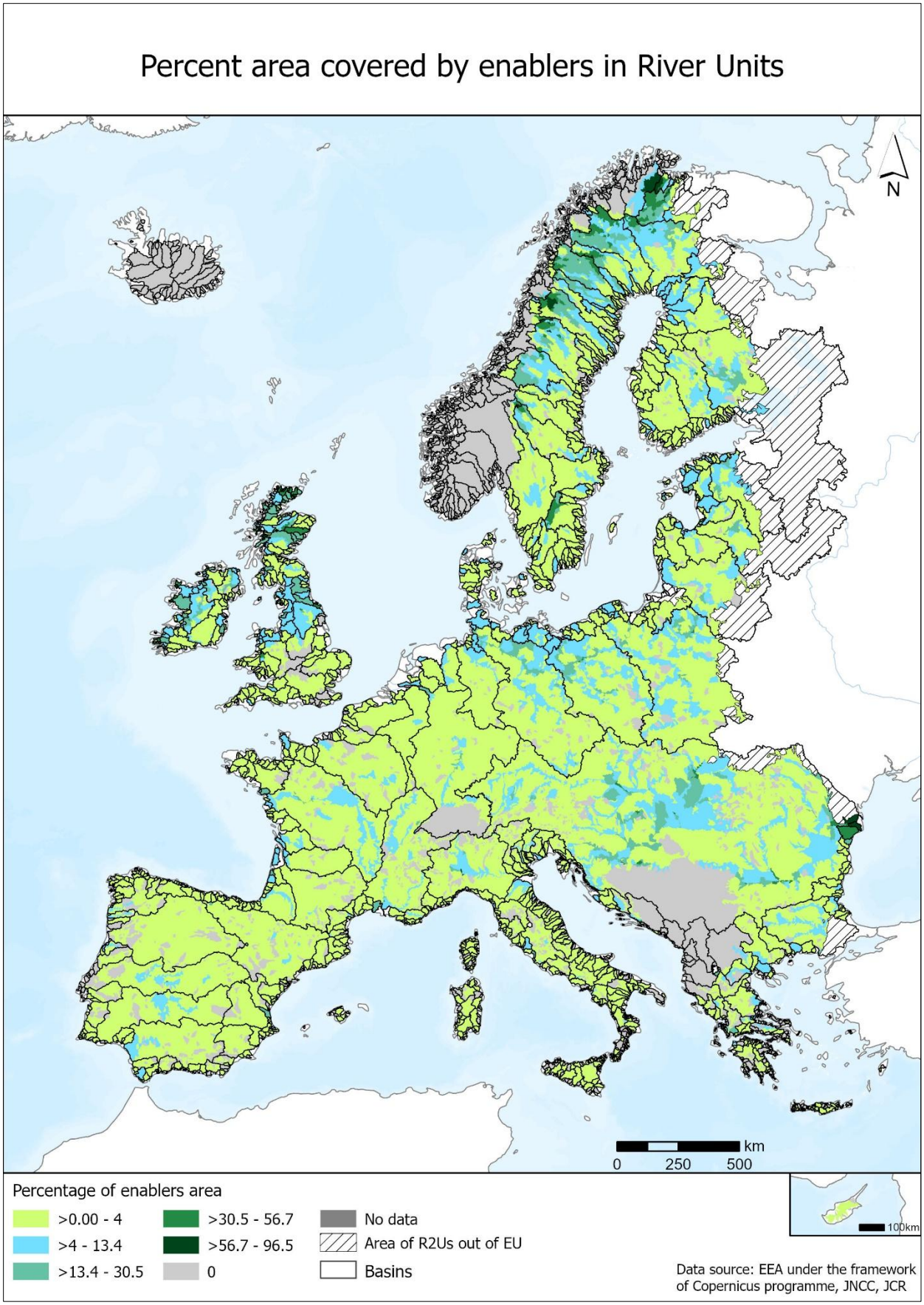


Figure 33. Percentage of the area covered by Enablers in River Restoration Units

Restoration Potential Indicator

Data and Methods

By integrating the indicators of ES co-benefits, restoration constraints and restoration enablers we were able to create an indicator, the Restoration Potential Indicator (RPI), reflecting the easiness of implementing restoration actions and the potential to obtain ES co-benefits from these actions. Both the ES assessment indicator values and the restoration constraint values present a negative relation with restoration needs, meaning higher values represent fewer potential co-benefits and higher restraints, respectively. Conversely, the restoration enablers present a positive relation, with higher values indicating a higher easiness of action. As, such, the later parameter was inverted before the overall integration into a single indicator value. To establish the RPI, and since all components have been previously standardised, values were integrated by representing every combination of the three components in a 2D Cartesian coordinate system and summing the triangular area originated by this representation. This creates an indicator value for which lower values translate higher ES upside and easiness of action towards restoration, while larger values indicate the opposite, less potential for ES co-benefits and higher resistance to the implementation of restoration measures.

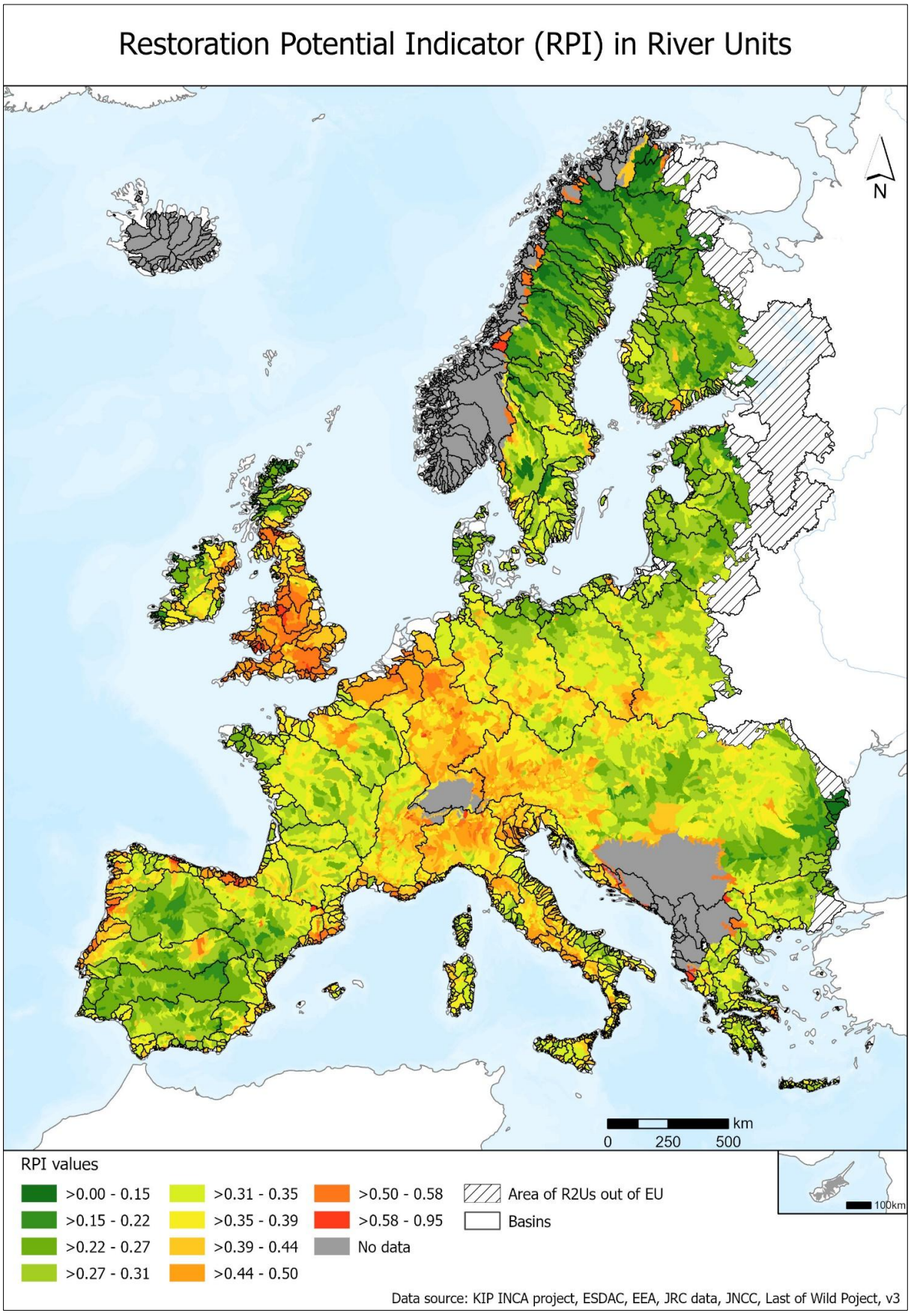


Figure 34 Restoration Potential Indicator in River Restoration Units

6 Part III – Integration of restoration needs and restoration potential

Data and Methods

The restoration needs were determined by integrating the non-abidance of both Habitats and Water Framework Directives at the R2U level. To achieve this, the R2Us classification was used, which was previously done for the "integrated composite indicator of conservation status of freshwater related protected habitats and species under Habitats Directive" and the "Composite indicator of conservation status of Water Framework Directive good ecological status prediction." The integration was accomplished through a bivariate choropleth map, which then resulted in a simplified reclassification into "Compliance" (abiding both directives), "Partial compliance" (abiding to one directive) "Partial needs" (not abiding to one directive), "Needs" (not abiding to both directives) and "Unknown". Whenever restoration needs (directive non-abidance) existed coming from one of the directives that was the prevailing term. The "Partial" terminology derived e.g. from having R2Us without data for one of the directives.

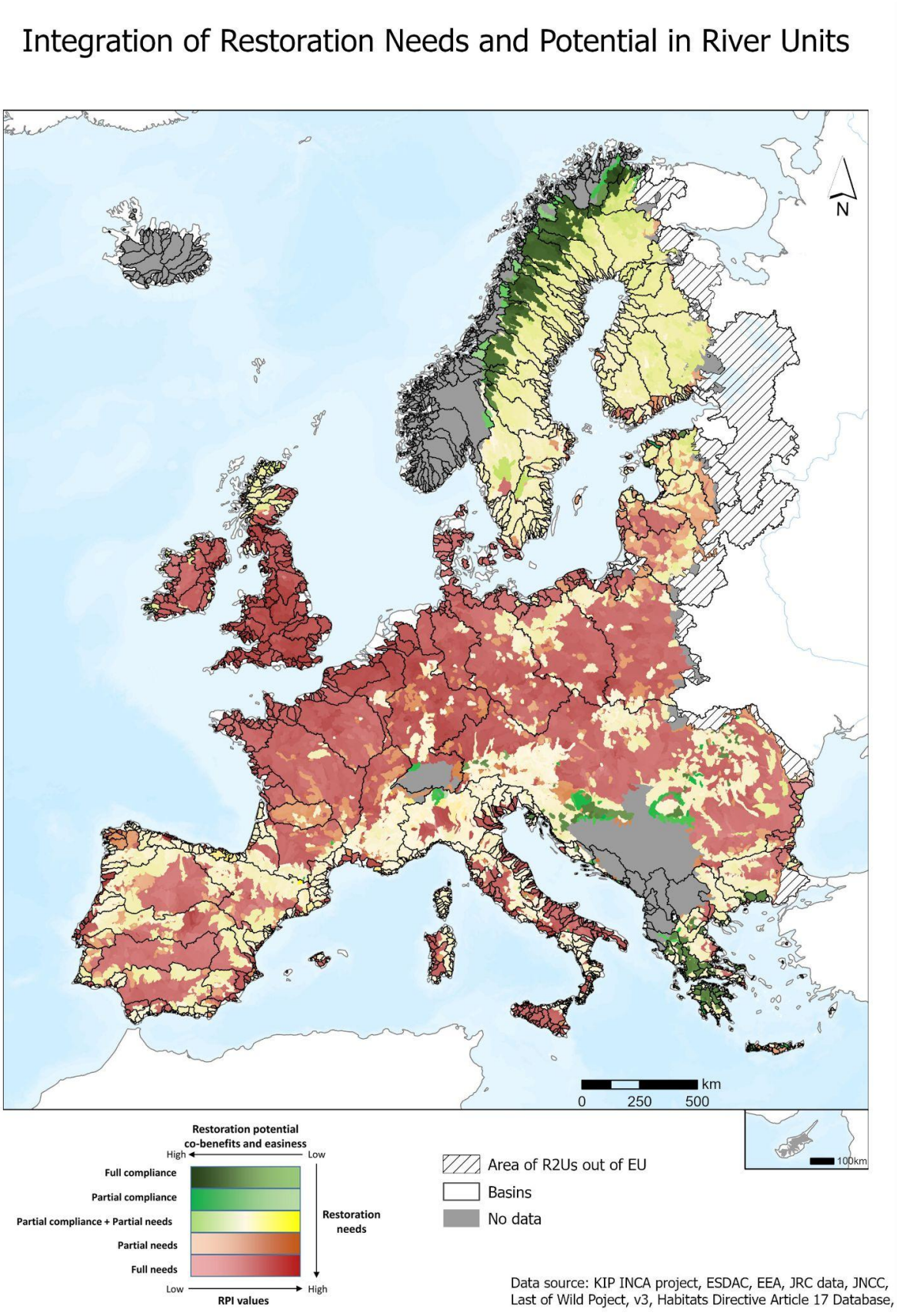


Figure 35. Integration of restoration needs and restoration potential in River Restoration Units

6 Synthesis

This mapping exercise resulted in an integrative overview of Europe's current state of freshwater habitats, associated species, and overall ecological condition. It allowed for the spatialization of some of the variables affecting such states at the same resolution, and how projected climate changes will predictably impact freshwater systems. The River Restoration Units (R2Us) across Europe were classified based on their integrative need for restoration (*Restoration Needs*) in relation to their abidance, or lack thereof, to the goals of both Habitats and Water Framework Directives.

Since restoration of freshwater habitats cannot be homogenous across Europe, the potential for restoration was determined by integrating freshwater-related ecosystem services (ES), defining potential co-benefits of restoration for ES, identifying significant constraints to restoration, and potential facilitators of restoration (restoration enablers). These three axes of action were integrated into the Restoration Potential Indicator (RPI), which determines the ease of restoration and its potential co-benefits (*Restoration Potential*).

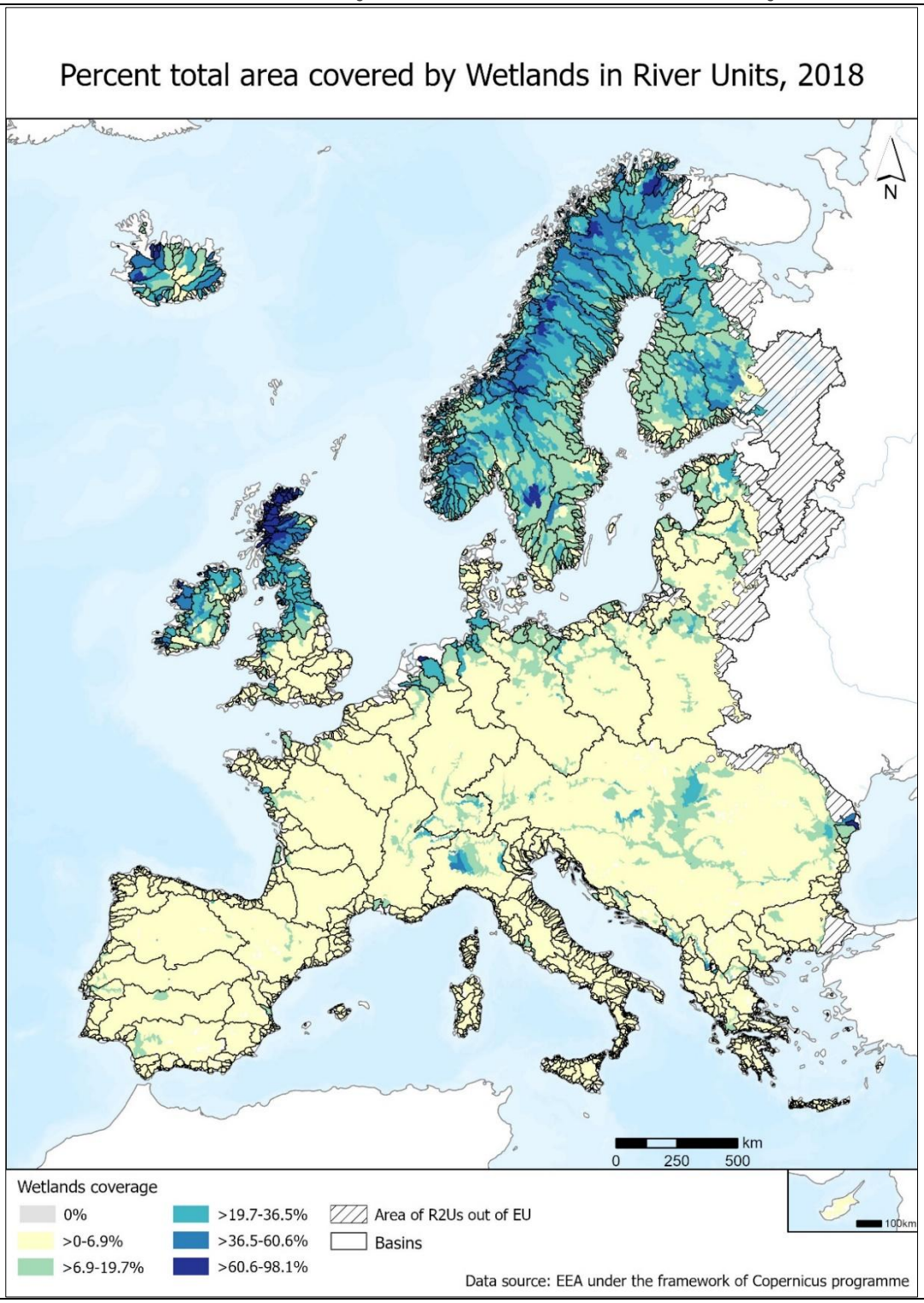
Classifying all R2Us according to their Restoration Needs and Restoration Potential allowed for an integration that demonstrates the potential for restoration according to the restoration needs category.

The take-home messages of this exercise are:

- River Restoration Units (R2Us) are a useful way of aggregating river segments into a reasonable spatial resolution for data aggregation and depiction at large spatial extents, integrating river network functions in a meaningful way.
- In some areas of Europe, there is a mismatch between habitats and species conservation status, meaning that in some regions, species are faring better than habitats and vice-versa.
- Some areas in the EU are faring particularly poorly in their abidance to the Habitats Directive, where freshwater-related habitats and species have an unfavorable status.
- The goal of good ecological status (sensu WFD) is not predicted to be achieved in extensive areas across central, western, and southern Europe.
- Restoration needs are almost constant throughout the EU, which is a clear warning that restoration of freshwater systems is urgently needed.
- Future climate changes, including hydrological changes, will exacerbate the observed overall differences across the EU. The extremes will become further apart without proactive action.
- There is a high number of large transversal barriers affecting European Freshwaters, producing dramatic habitat fragmentation that will particularly affect species with a waterborne life cycle stage, as their longitudinal and lateral displacement is impaired.
- The fragmentation extent imposed by transversal barriers may affect restoration efforts that do not restore continuity, hindering the restoration benefits extensively for downstream and upstream areas.
- Highly urbanized, low Ecosystem Services areas with less freshwater encompassing N2K sites will have lower potential for restoration.
- Areas with full restoration needs outside highly urbanized areas and not of high water scarcity have higher potential for restoration co-benefits.
- Restoration actions have the potential for transforming European freshwaters' state by potentially improving habitats and species conservation status and ecological quality while improving Ecosystem Services.
- The predicted climatic changes will have an impact on water resources, which are determinant for freshwater habitats and species favourable status and water bodies' good ecological quality. Therefore, a future Prestoration (restoring ecosystem structure and function in the face of a changing climate) exercise is necessary to determine future restoration needs and potentials under global change scenarios.
- The outcomes of this mapping exercise should inform restoration managers on the areas in trouble with the highest upside for restoration.

7 Annex

River Units and freshwater-related ecosystems

Title	Percent total area covered by Wetlands in River Units for the year 2018
	
Summary	Percentage of wetlands coverage area in R2Us Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

Description	Percentage of wetland area in River Restoration Units.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Wetlands data: Extended wetland ecosystem layer 2018 (raster 100m) version 1, Jul. 2021 (https://sdi.eea.europa.eu/catalogue/idp/eng/catalog.search#/metadata/de2d0d77-a389-49d0-84d7-73a29046823f)
Limitation	No limitation

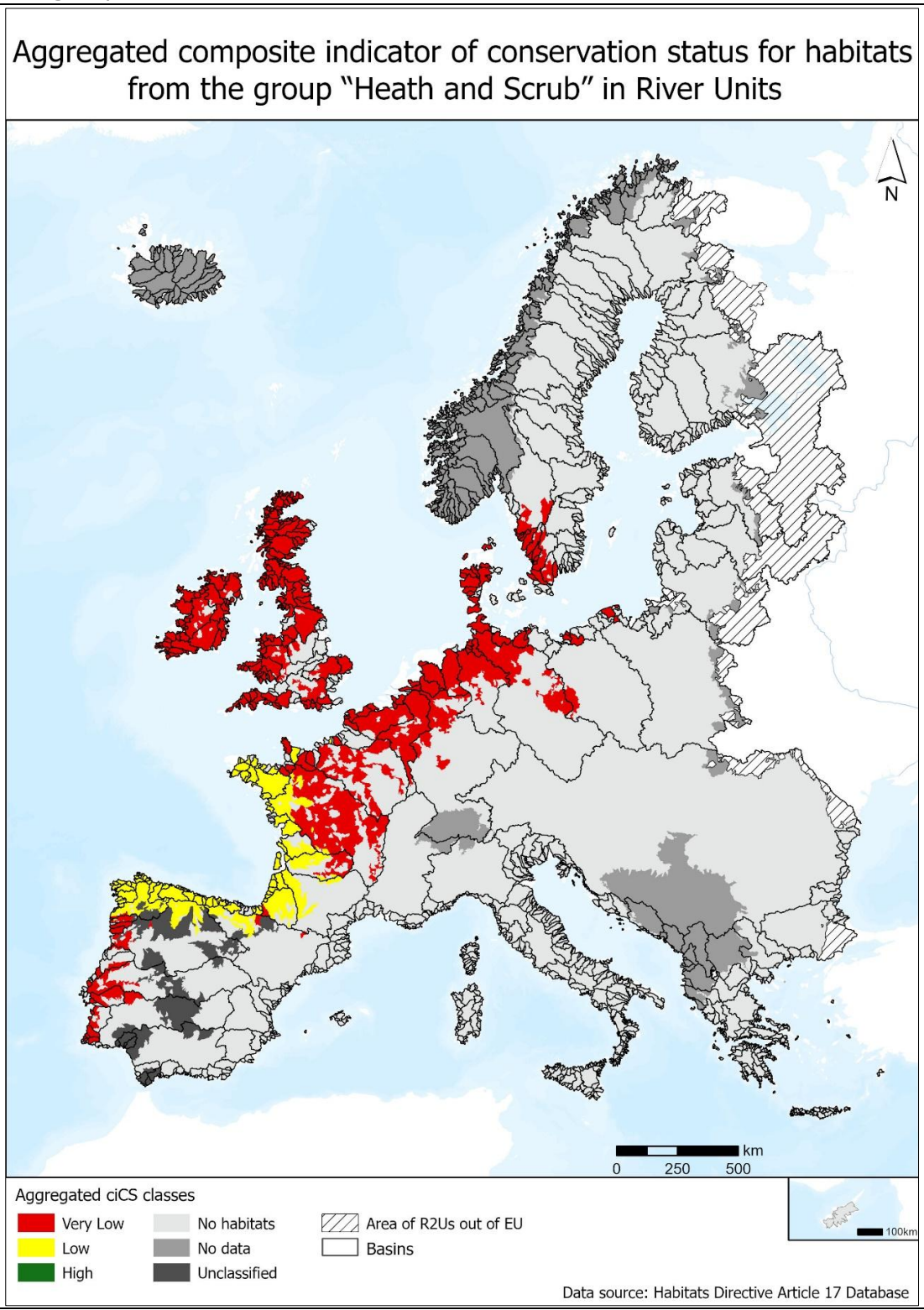
a.

Habitats Directive

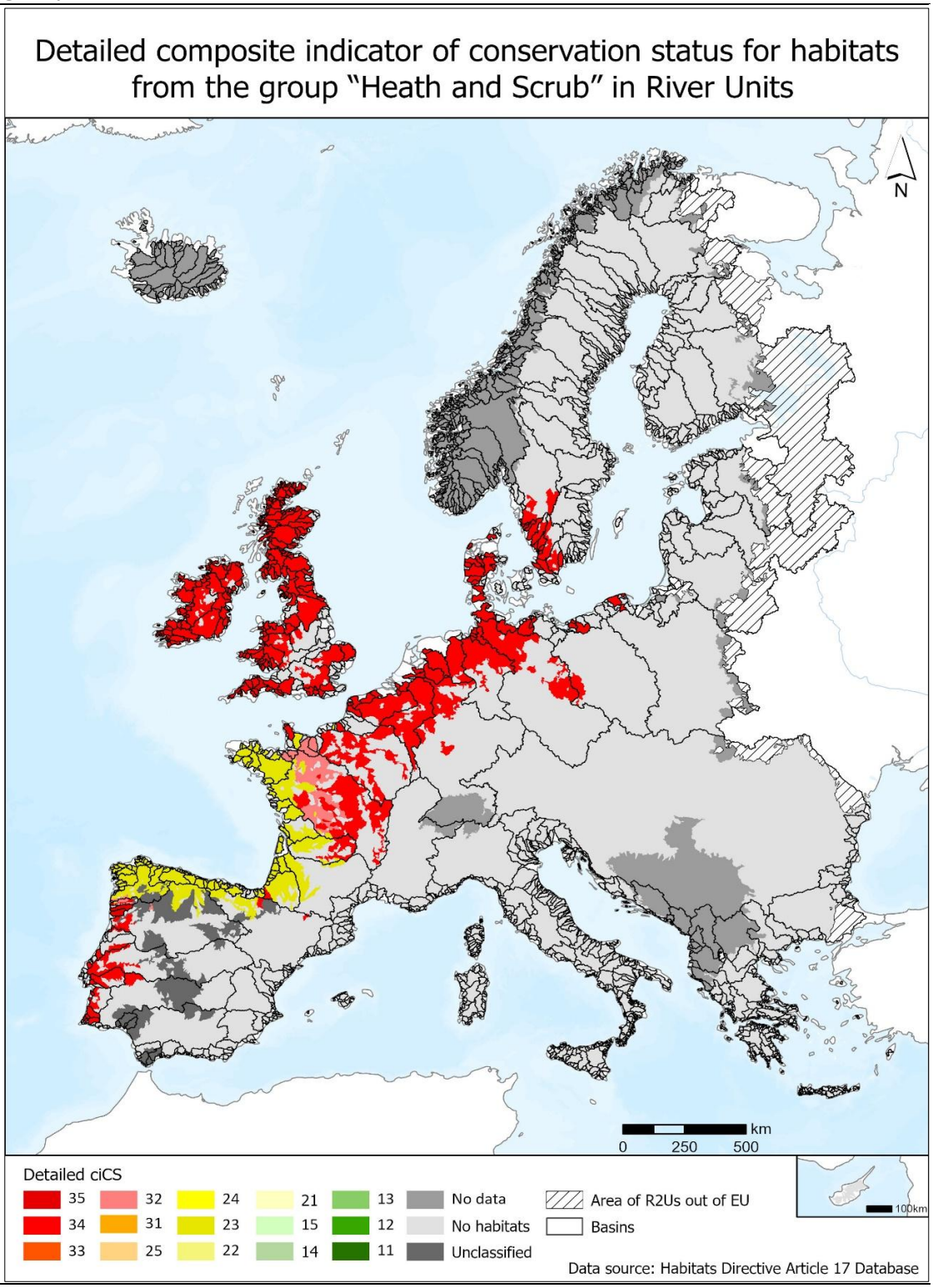
Habitats

Title	Number of habitats from the group “Heath and Scrub” in River Units
	
Summary	Number of habitats from the group “Grasslands” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0

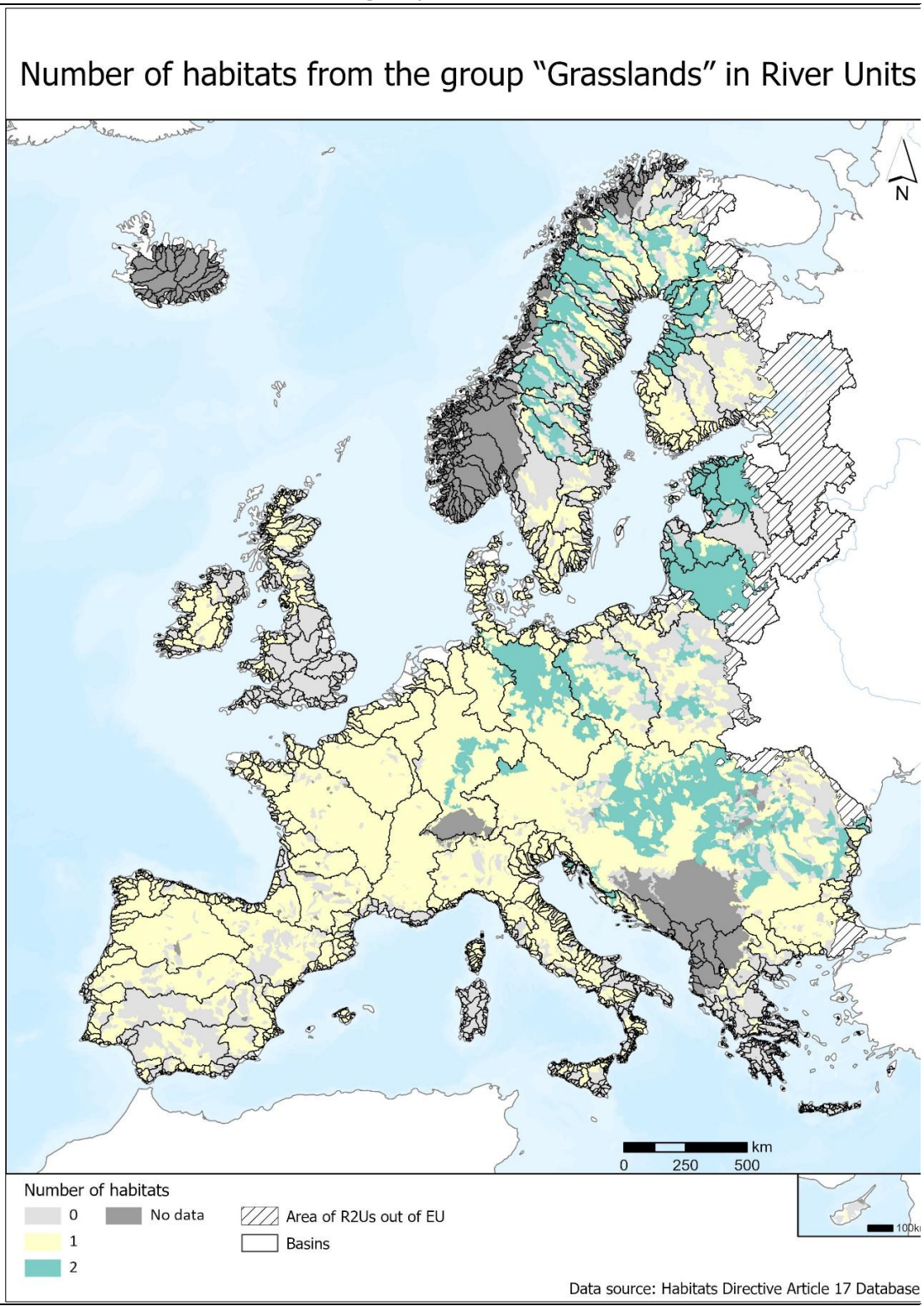
	Responsible: University of Lisbon
Description	Number of habitats from the group “Heath and Scrub” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Aggregated composite indicator of conservation status for habitats from the group “Heath and Scrub” in River Units
	
Summary	Aggregated Composite Indicator ciCS of Habitats from the group “Heath and Scrub” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0

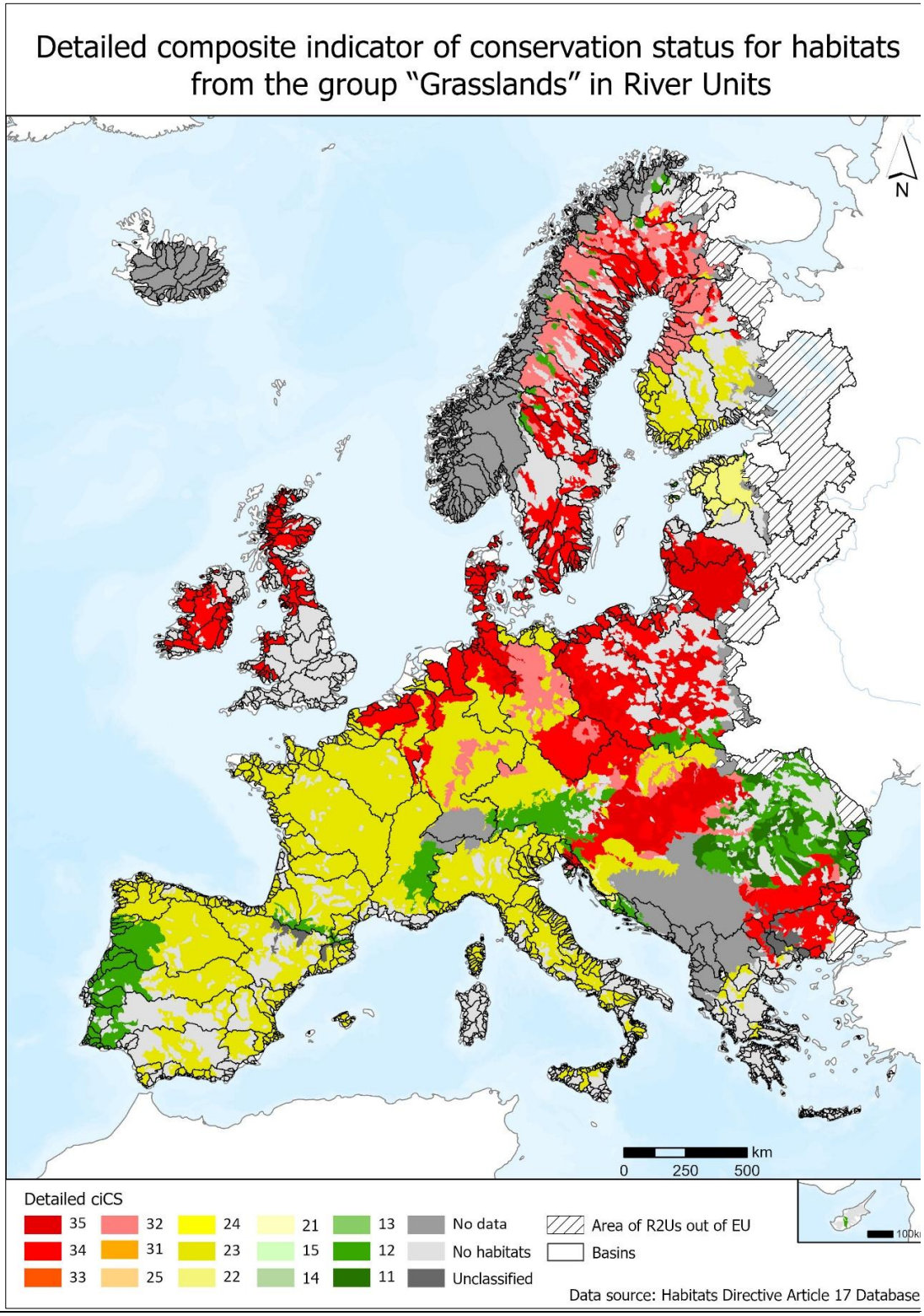
	Responsible: University of Lisbon
Description	Value of the aggregated Composite Indicator of Conservation Status (ciCS) considering the habitats belonging to the group “Heath and Scrub” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Detailed composite indicator of conservation status for habitats from the group “Heath and Scrub” in River Units
	
Summary	Detailed Composite Indicator ciCS of Habitats from the group “Grasslands” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023(date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

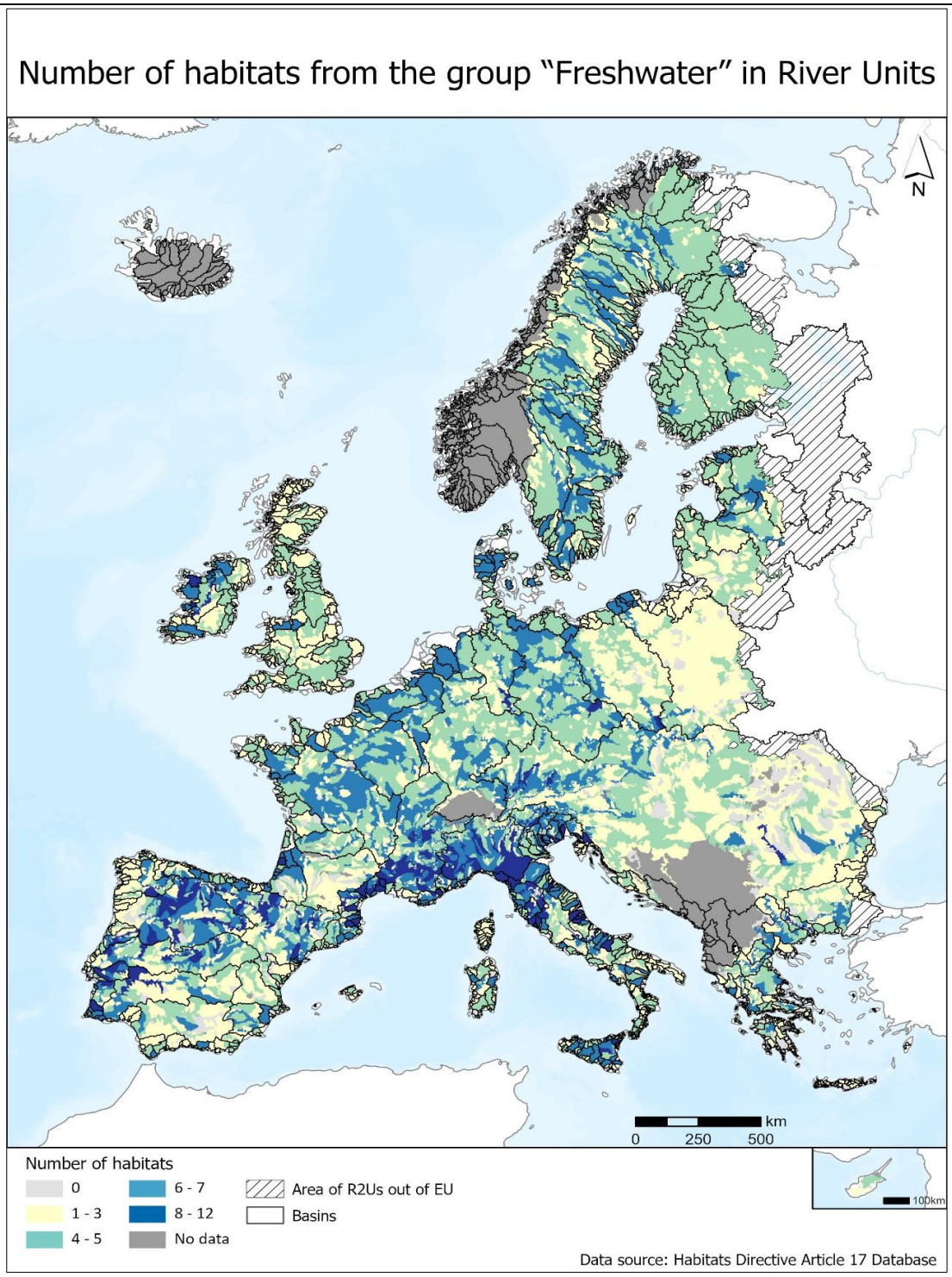
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the habitats belonging to the group “Heath and Scrub” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Number of habitats from the group “Grasslands” in River Units
Map 15d	
Summary	Number of habitats from the group “Grasslands” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023(date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

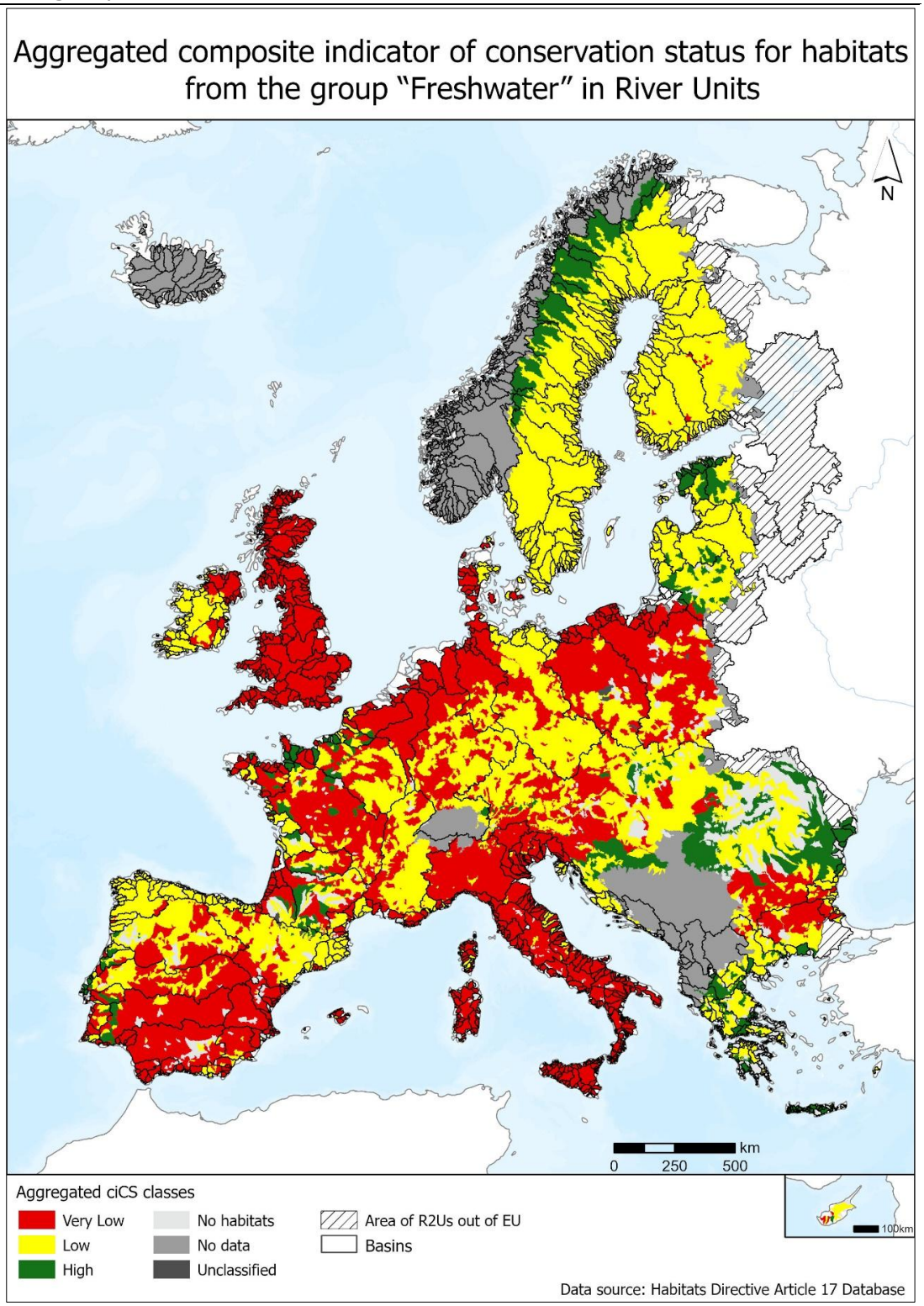
Description	Number of habitats from the group “Grasslands” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Detailed composite indicator of conservation status for habitats from the group “Grasslands” in River Units
	
Summary	Detailed Composite Indicator ciCS of Habitats from the group “Grasslands” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023(date reflecting inclusion in this DB) Resolution: R2U

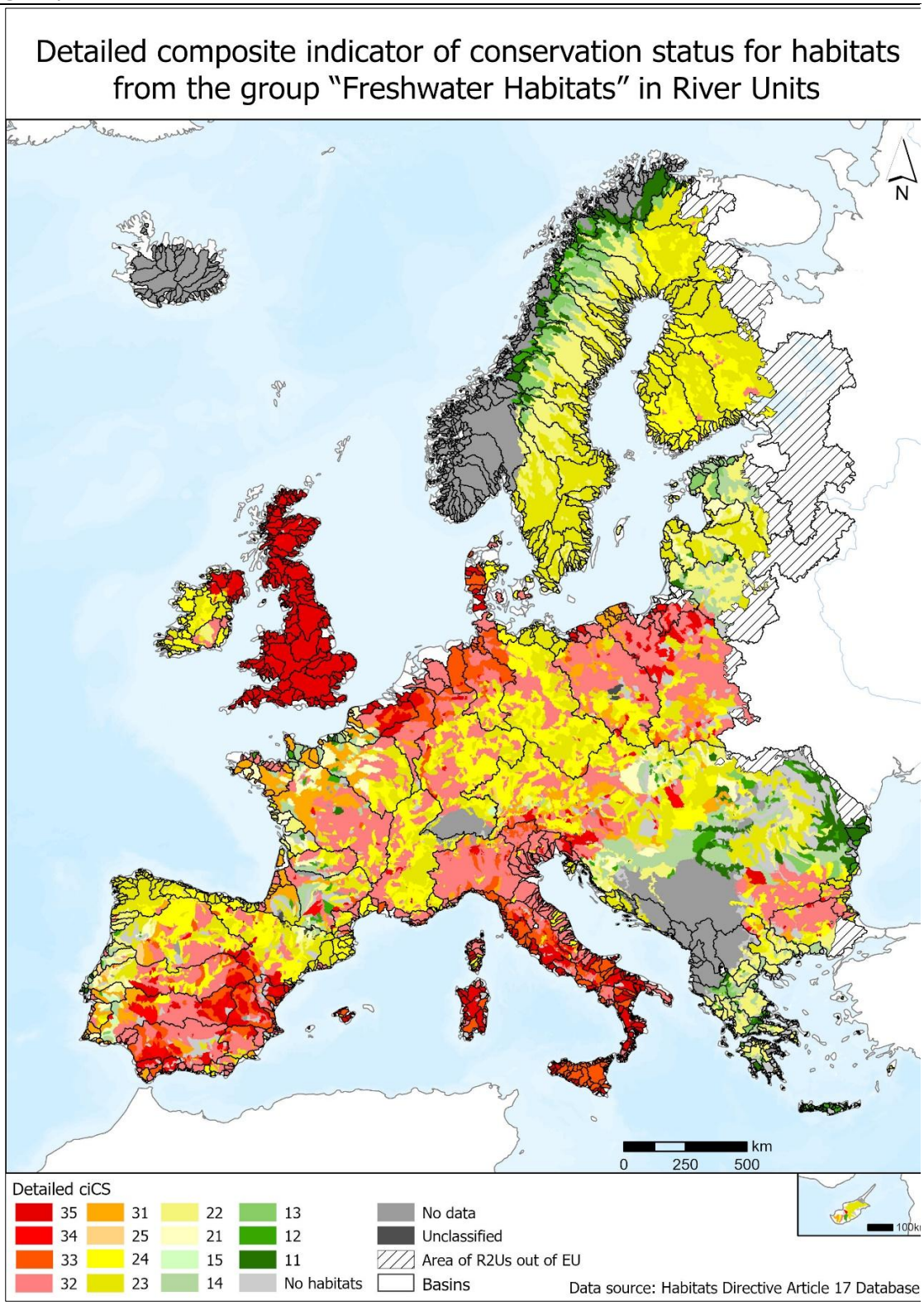
	Version: 3.0 Responsible: University of Lisbon
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the habitats belonging to the group “Grasslands” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Number of habitats from the group “Freshwater Habitats” in River Units
	
Summary	Number of habitats from the group “Freshwater Habitats” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon
Description	Number of habitats from the group “Freshwater Habitats” present in the R2U.

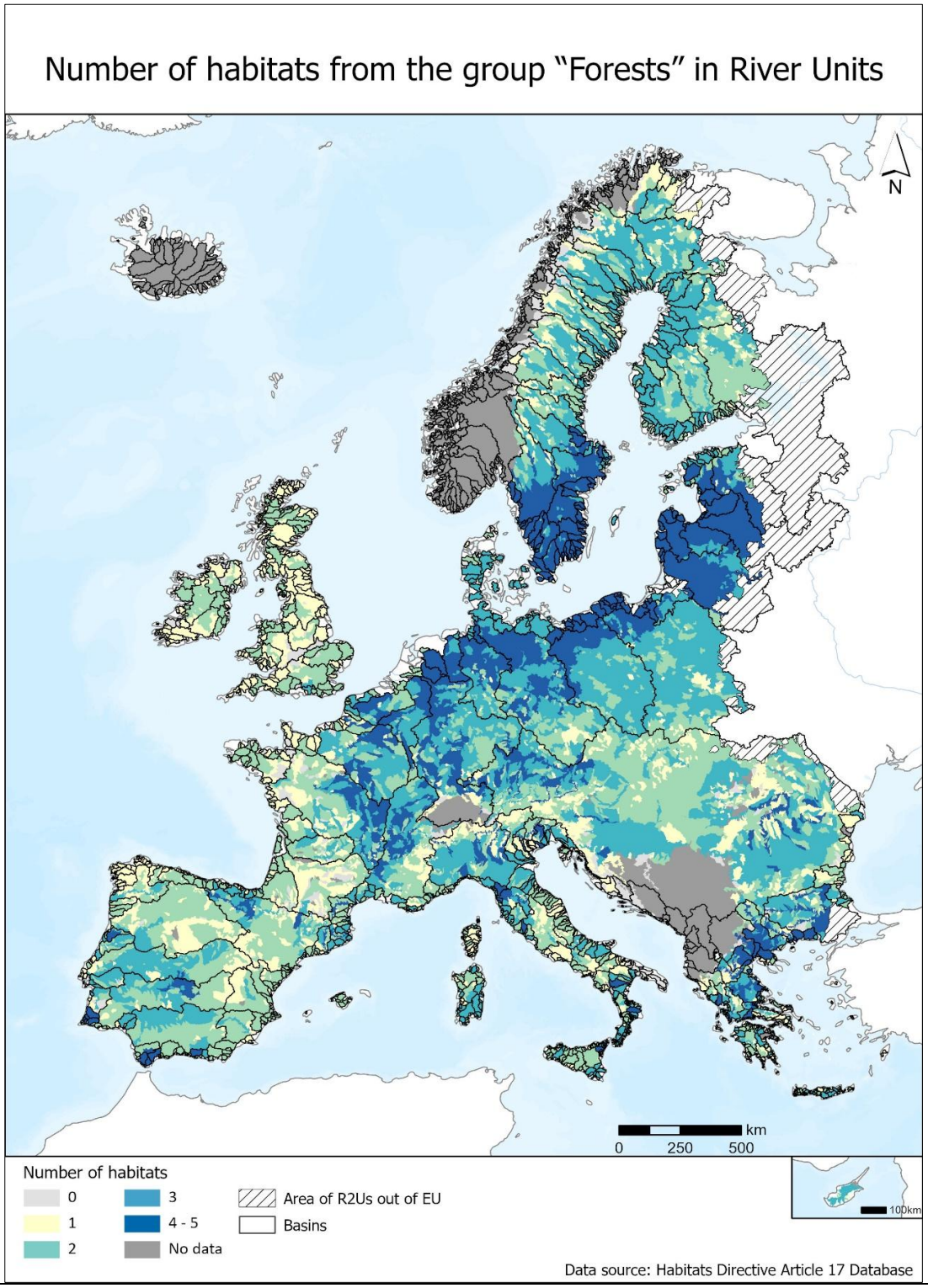
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Aggregated composite indicator of conservation status for habitats from the group “Freshwater Habitats” in River Units
	
Summary	Aggregated Composite Indicator ciCS of Habitats from the group “Freshwater Habitats” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U

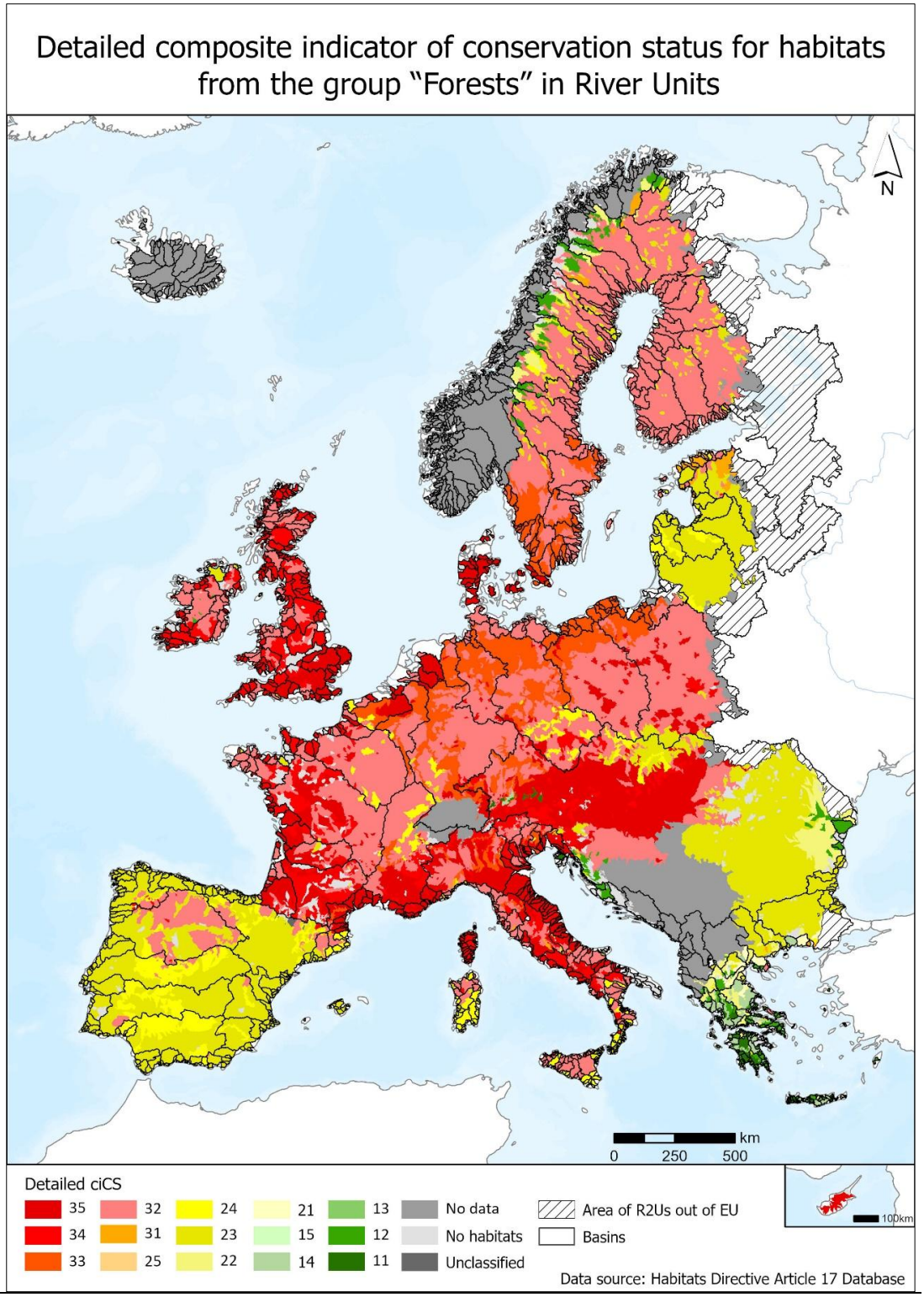
	Version: 3.0 Responsible: University of Lisbon
Description	Value of the aggregated Composite Indicator of Conservation Status (ciCS) considering the habitats belonging to the group “Freshwater Habitats” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Detailed composite indicator of conservation status for habitats from the group “Freshwater Habitats” in River Units
Map 16c	
Summary	Detailed Composite Indicator ciCS of Habitats from the group “Freshwater Habitats” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U

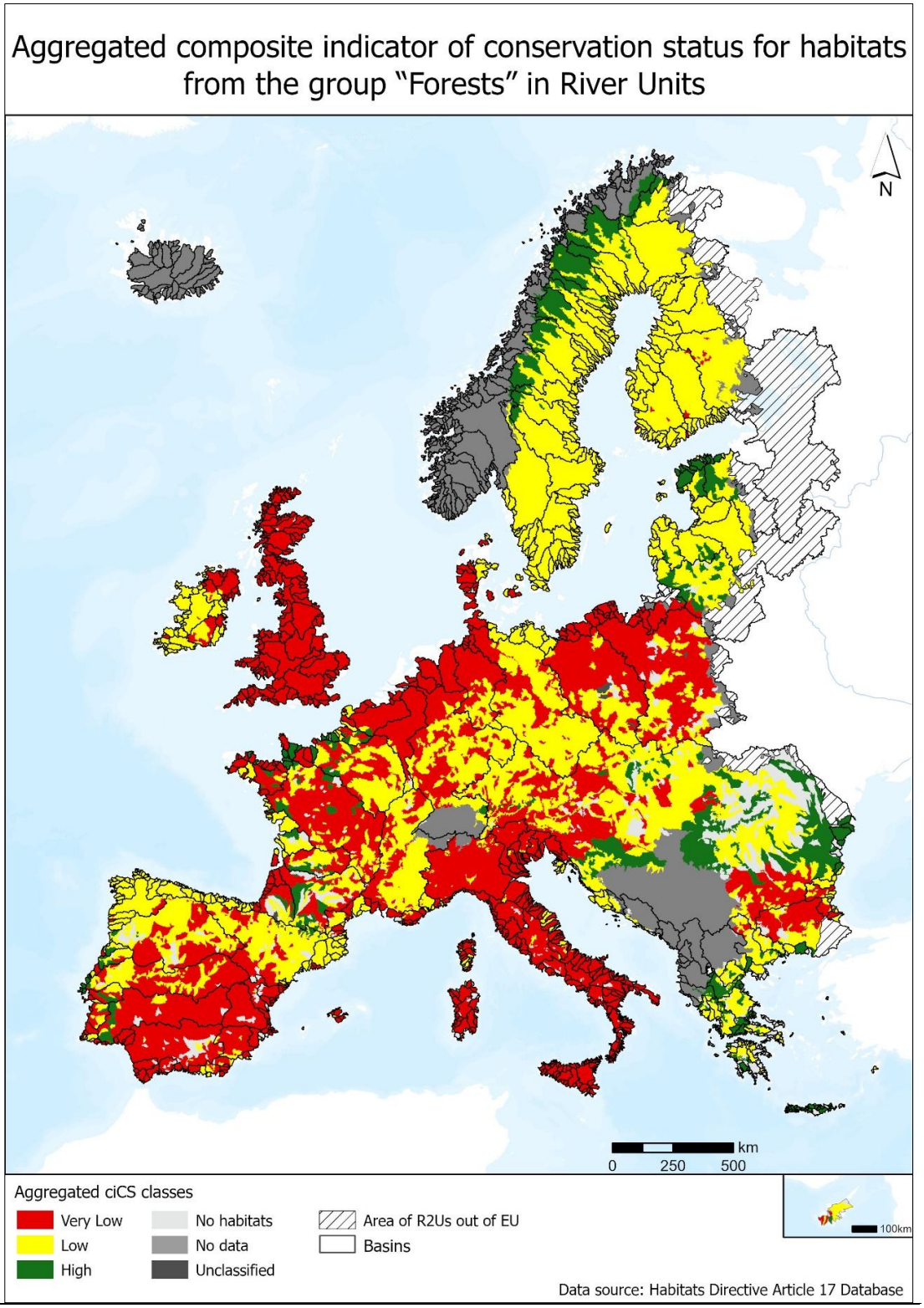
	Version: 3.0 Responsible: University of Lisbon
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the habitats belonging to the group “Freshwater Habitats” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Number of habitats from the group “Forests” in River Units
	
Summary	Number of habitats from the group “Forests” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon
Description	Number of habitats from the group “Forests” present in the R2U.

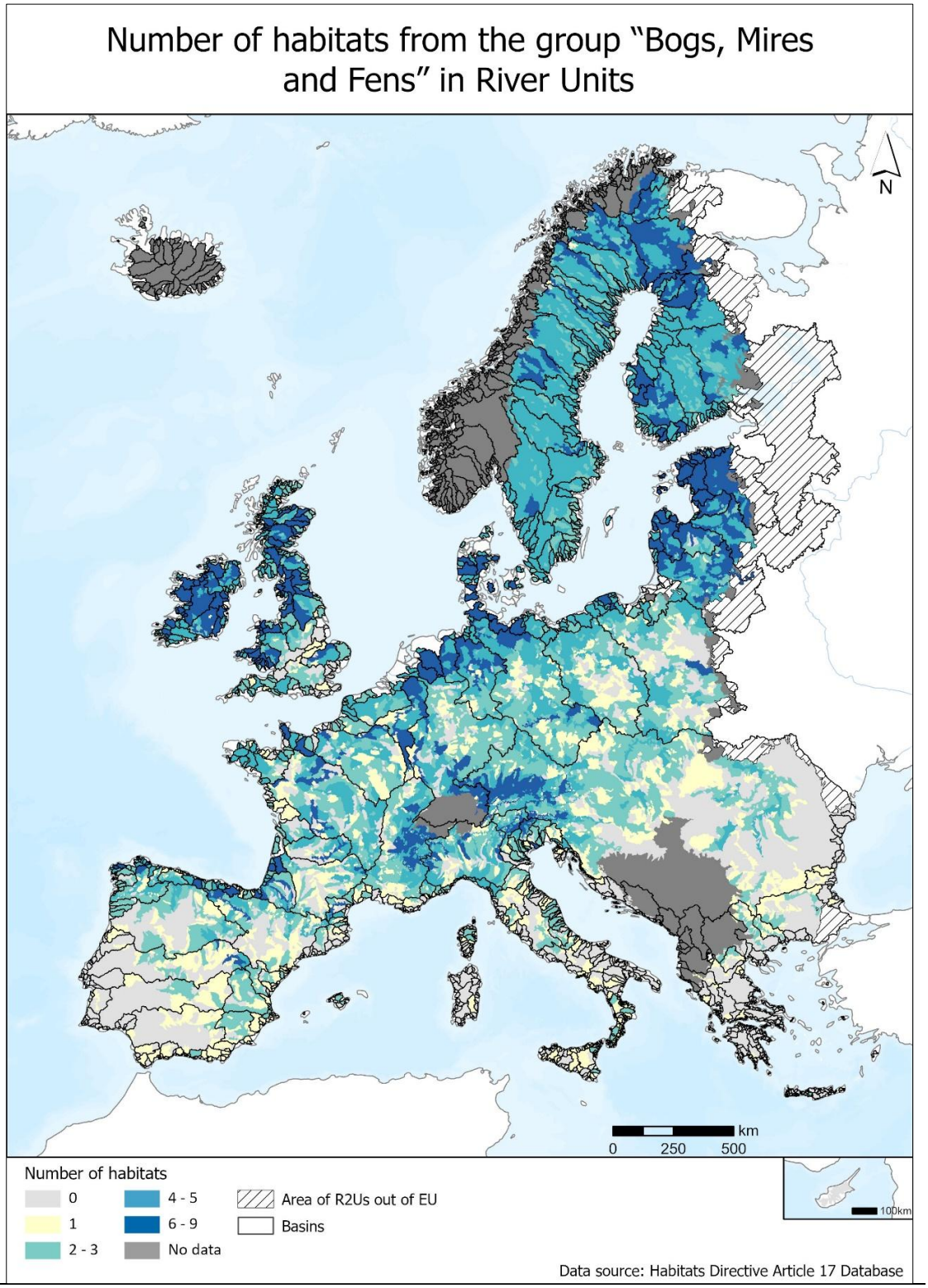
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Detailed composite indicator of conservation status for habitats from the group “Forests” in River Units
	
Summary	Detailed Composite Indicator ciCS of Habitats from the group “Forests” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

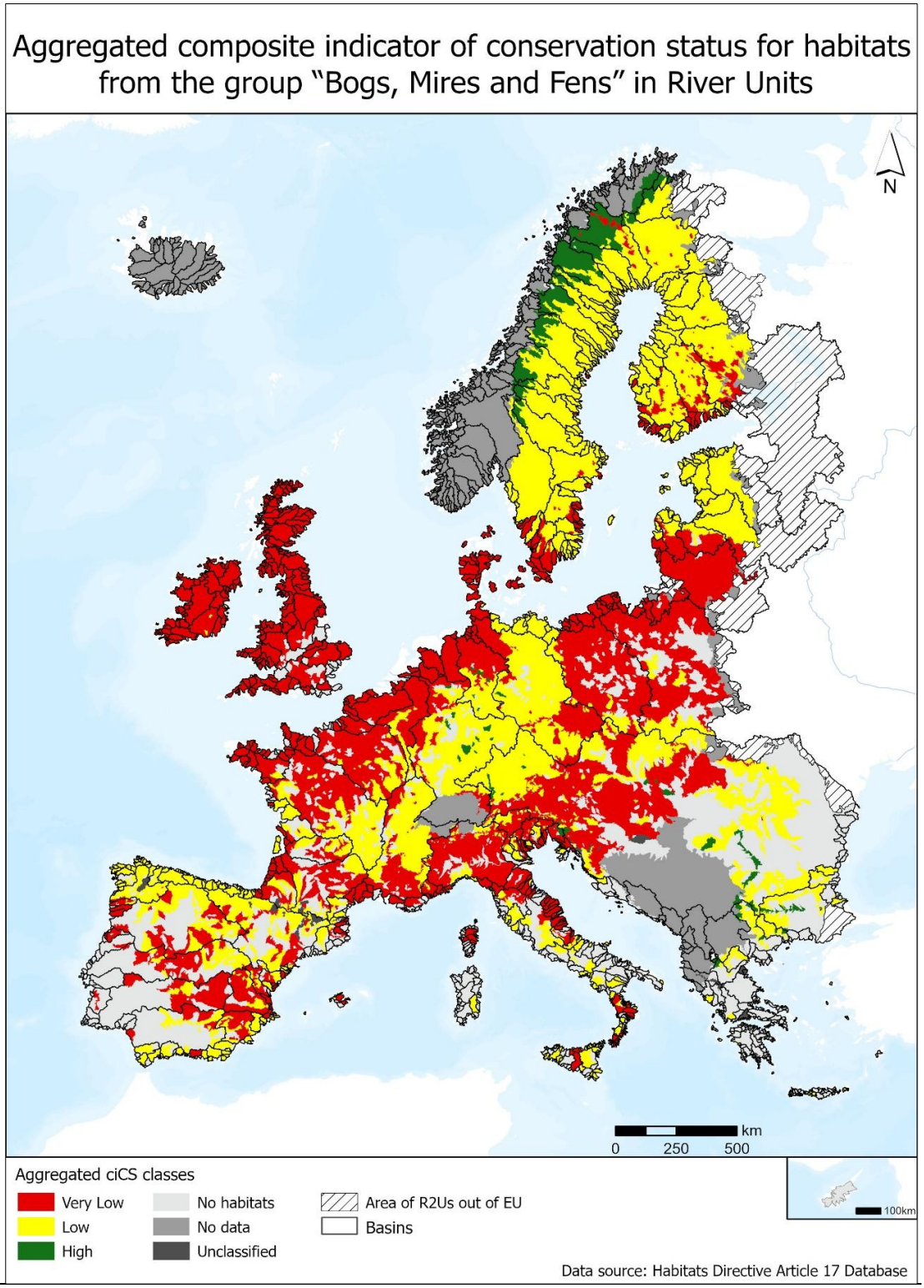
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the habitats belonging to the group “Forests” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Aggregated composite indicator of conservation status for habitats from the group “Forests” in River Units
	
Summary	Aggregated Composite Indicator ciCS of Habitats from the group “Forests” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023(date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

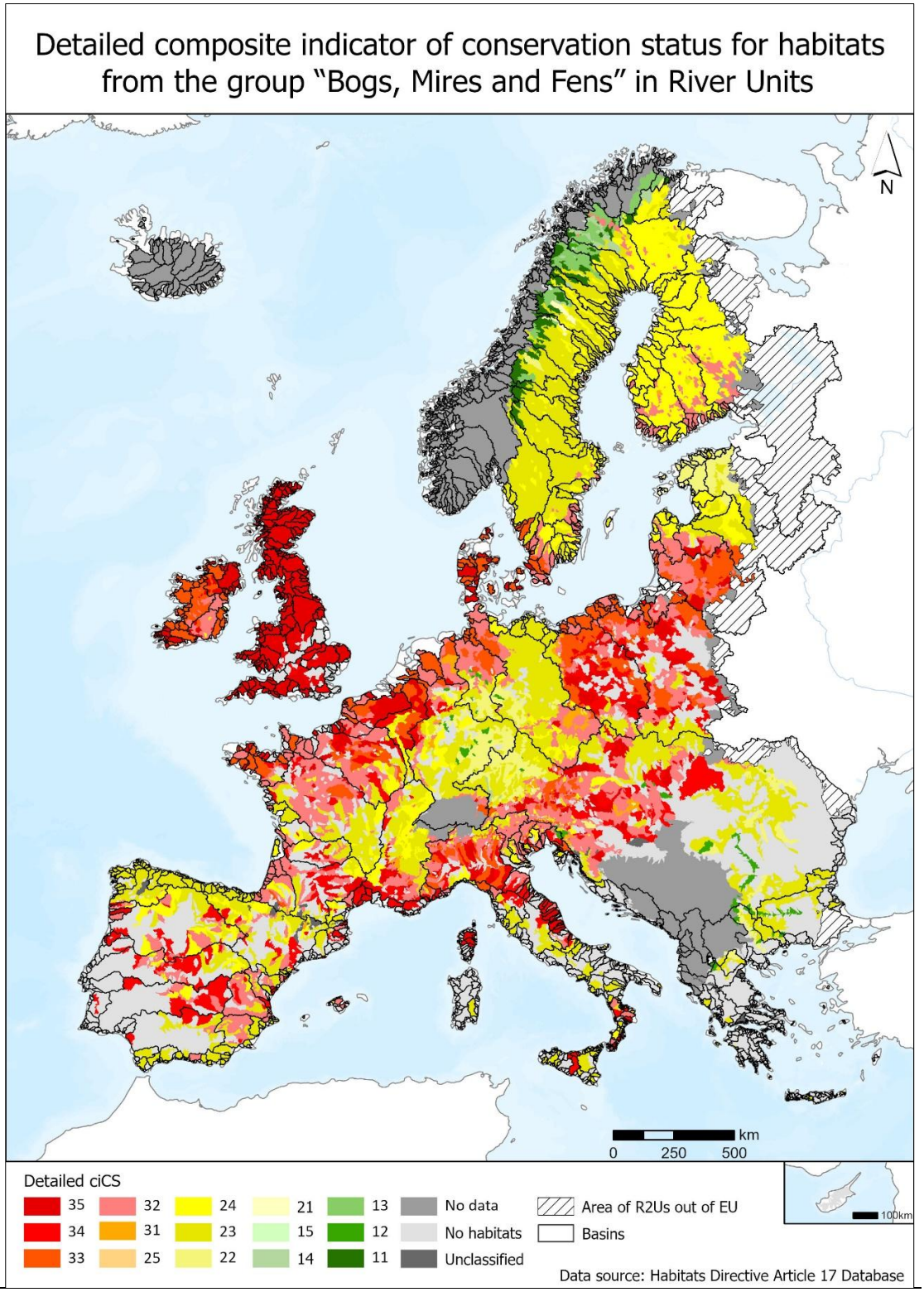
Description	Value of the aggregated Composite Indicator of Conservation Status (ciCS) considering the habitats belonging to the group “Forests” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Number of habitats from the group “Bogs, Mires and Fens” in River Units.
	
Summary	Number of habitats from the group from the group “Bogs, Mires and Fens” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

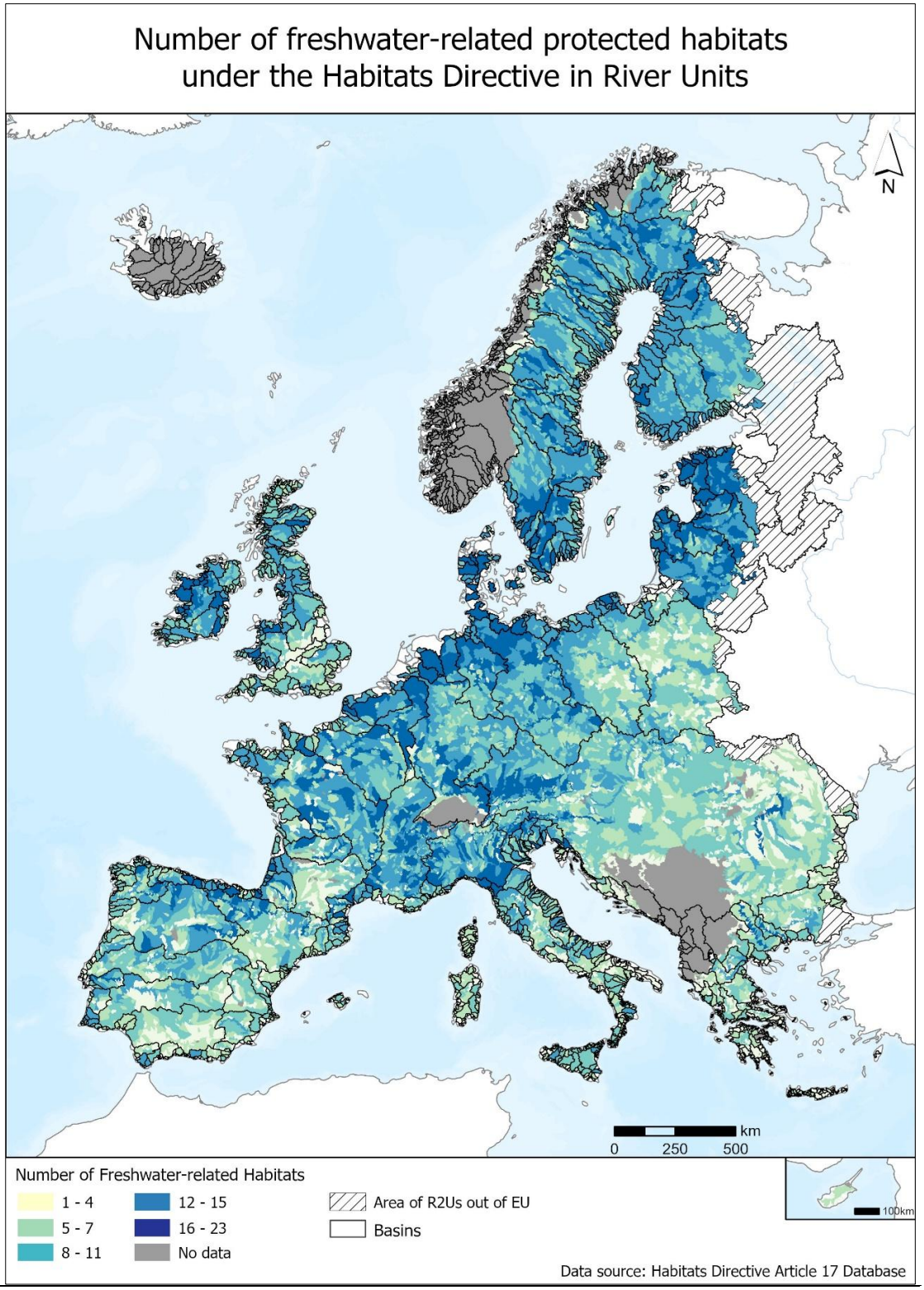
Description	Number of habitats from the group “Bogs, Mires and Fens”.present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Aggregated composite indicator of conservation status for habitats from the group “Bogs, Mires and Fens” in River Units
	
Summary	Aggregated Composite Indicator ciCS of Habitats from the group “Bogs, Mires and Fens” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023(date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

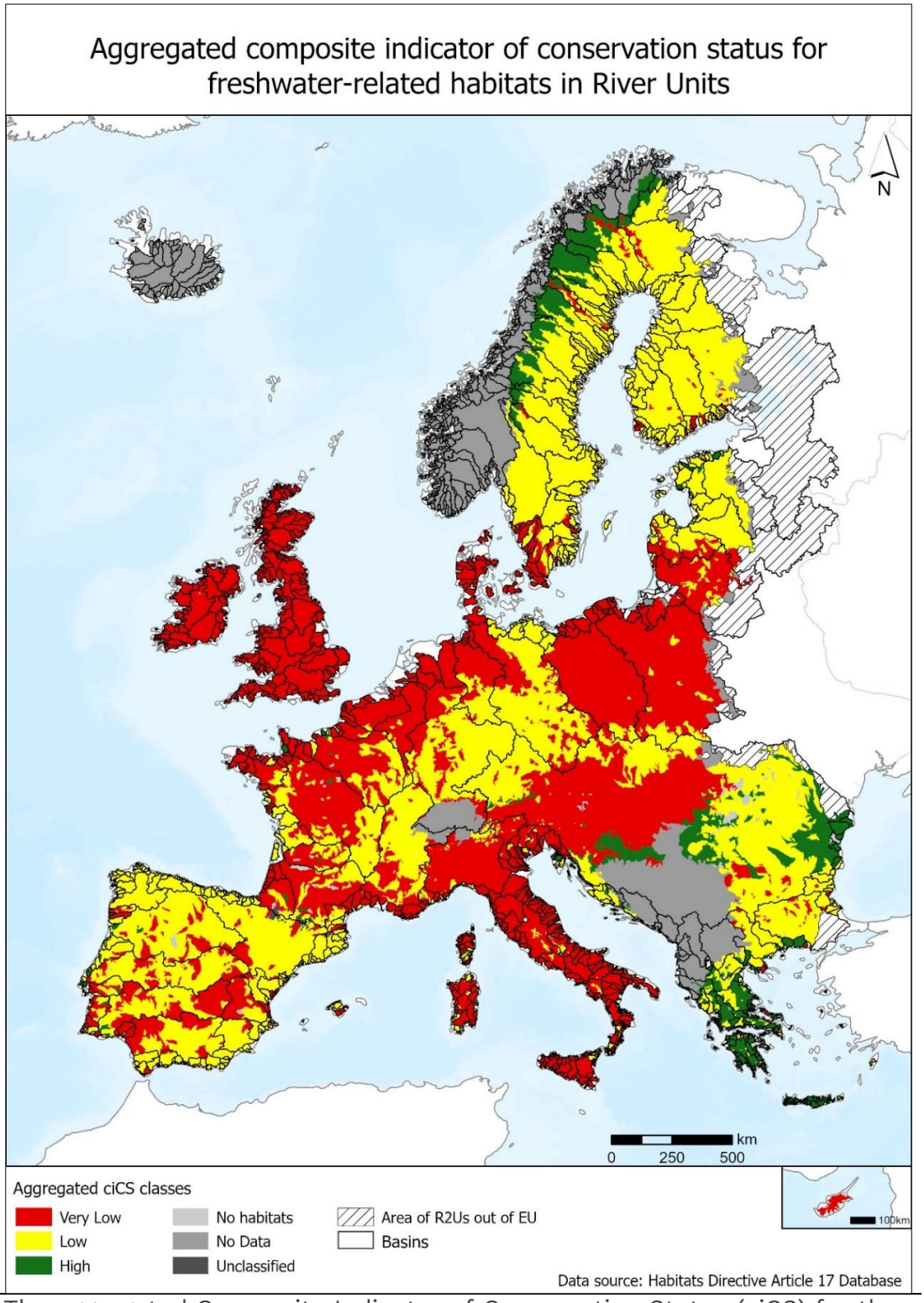
Description	Value of the aggregated Composite Indicator of Conservation Status (ciCS) considering the habitats belonging to the group “Bogs, Mires and Fens” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Detailed composite indicator of conservation status for habitats from the group “Bogs, Mires and Fens” in River Units
	
Summary	Detailed Composite Indicator ciCS of Habitats from the group “Bogs, Mires and Fens” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023(date reflecting inclusion in this DB) Resolution: R2U Version: 3.0

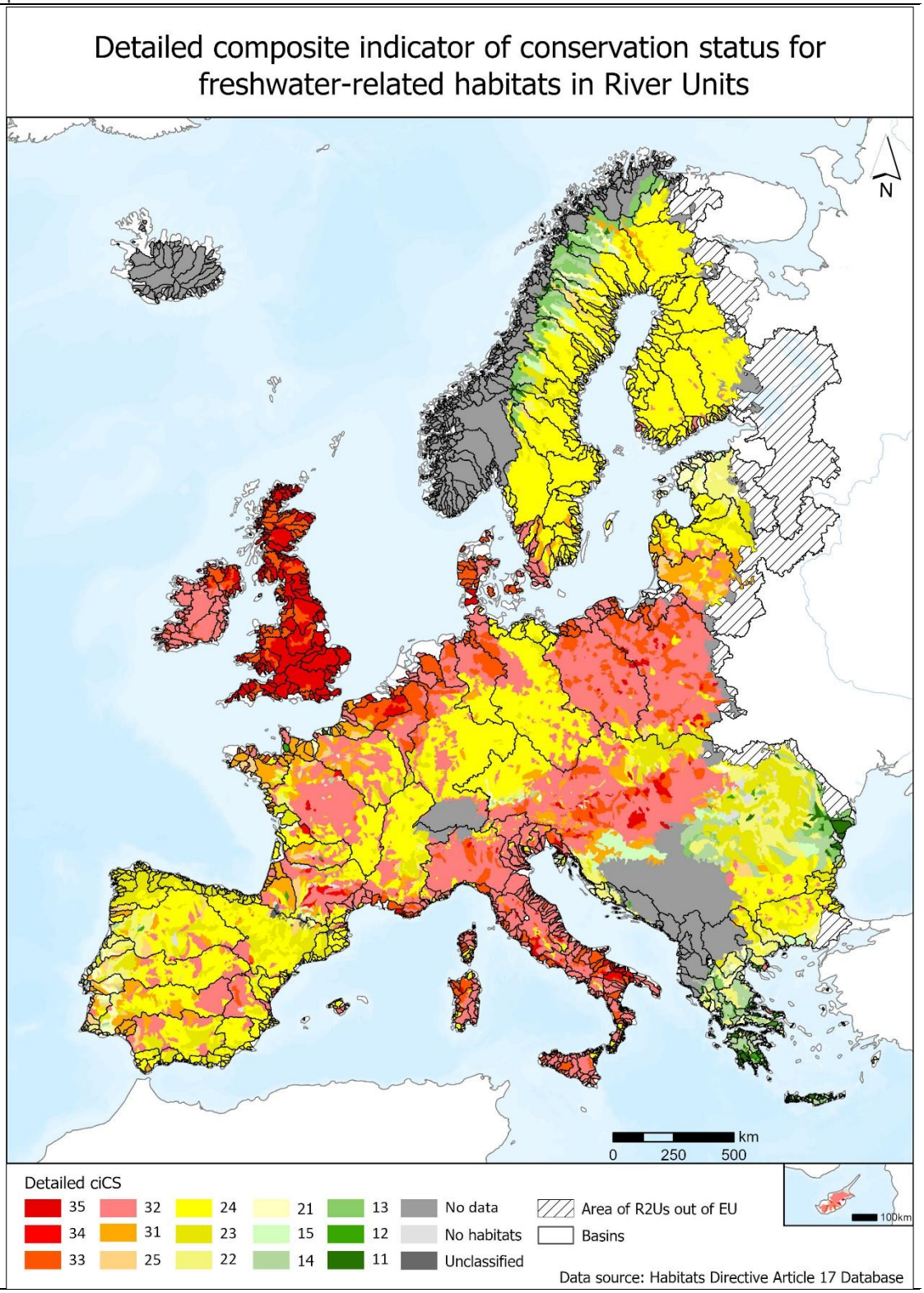
	Responsible: University of Lisbon
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the habitats belonging to the group “Bogs, Mires and Fens” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Number of freshwater-related protected habitats under the Habitats Directive in River Units
	
Summary	The number of overall freshwater-related habitats from article 17 of the Habitats Directive present in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0

	Responsible: University of Lisbon
Description	Number of overall habitats present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

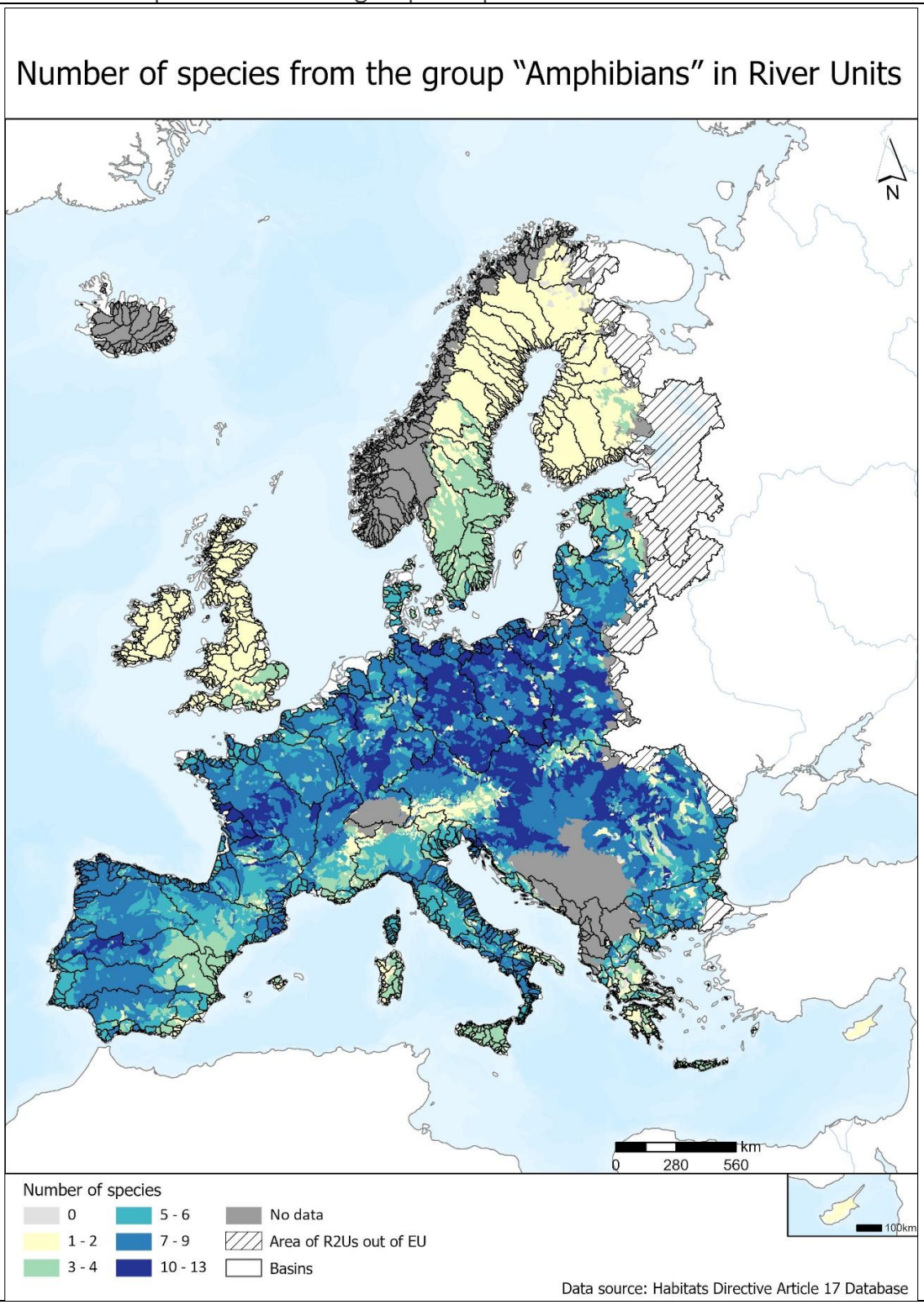
Title	Aggregated composite indicator of conservation status for freshwater-related protected habitats under the Habitats Directive in River Units
	
Summary	The aggregated Composite Indicator of Conservation Status (ciCS) for the overall freshwater-related from article 17 of the Habitats Directive present in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB)

	Resolution: R2U Version: 3.0 Responsible: University of Lisbon
Description	Value of the aggregated Composite Indicator of Conservation Status (ciCS) considering the overall habitats present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

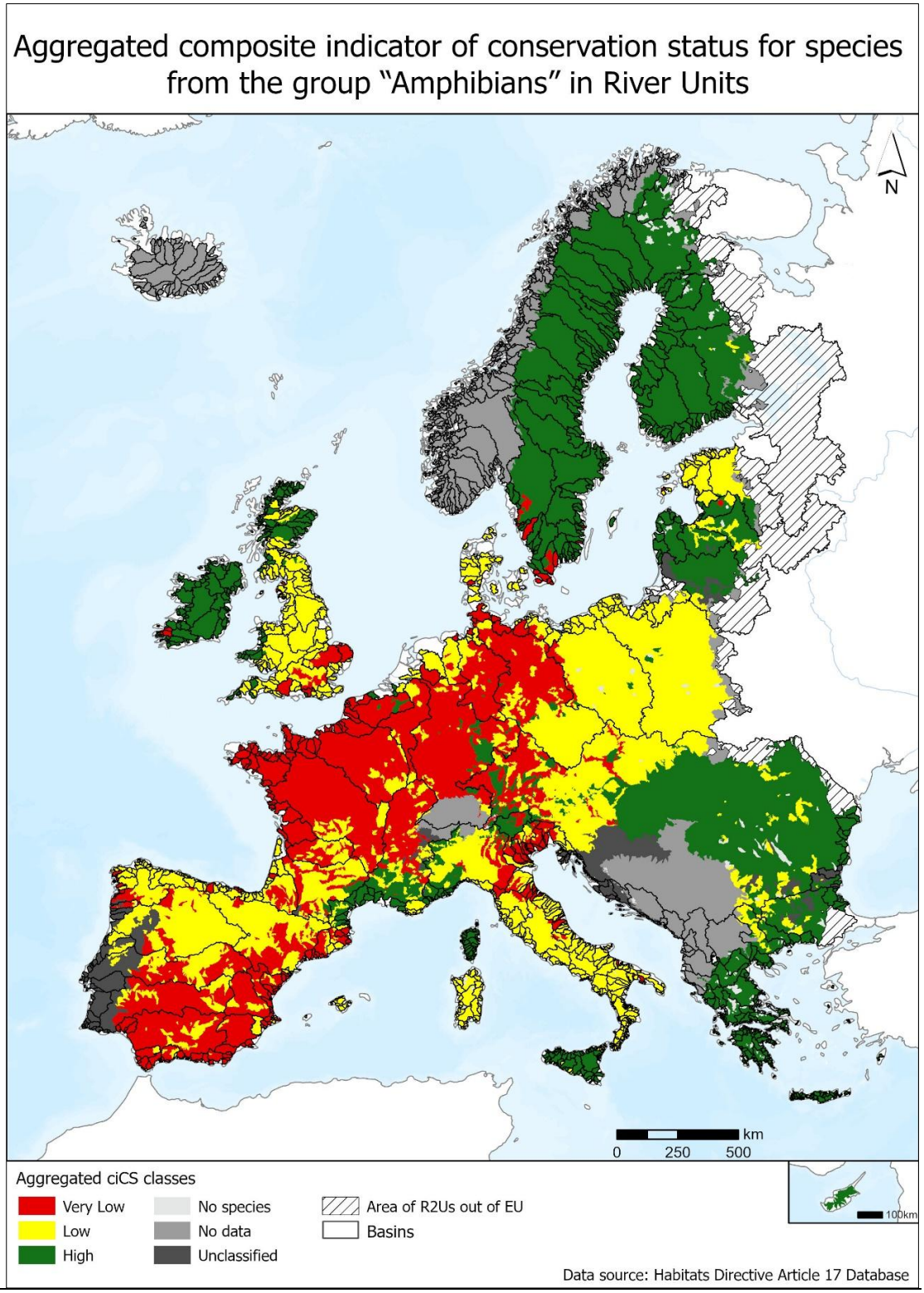
Title	Detailed composite indicator of conservation status for freshwater-related protected habitats under the Habitats Directive in River Units
	
Summary	The detailed Composite Indicator of Conservation Status (ciCS) for the overall freshwater-related habitats from article 17 of the Habitats Directive present in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0

	Responsible: University of Lisbon
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the overall habitats present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

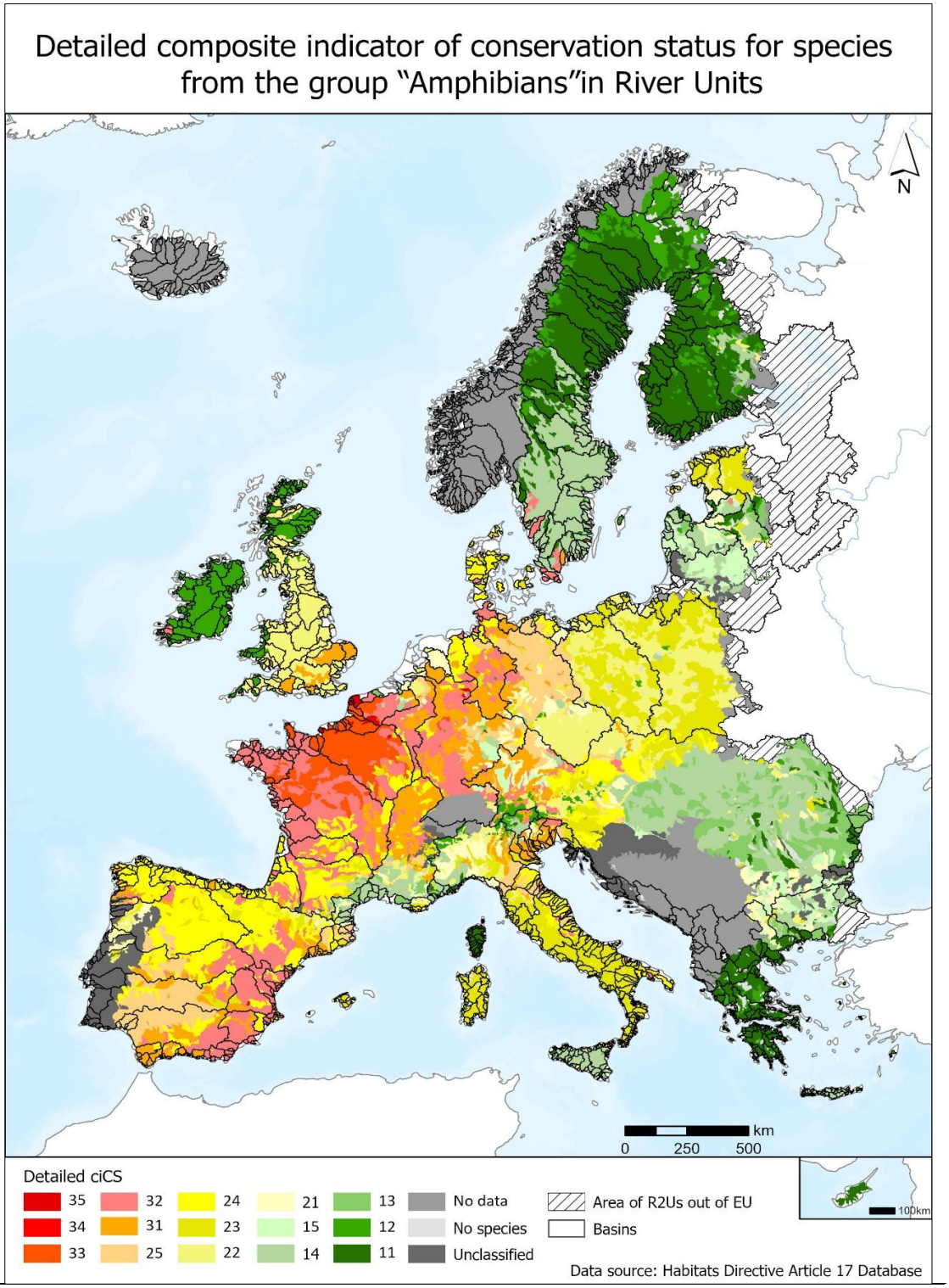
Species

Title	Number of species from the group “Amphibians” in River Units.
	
Summary	Number of species from the group from the group “Amphibians” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

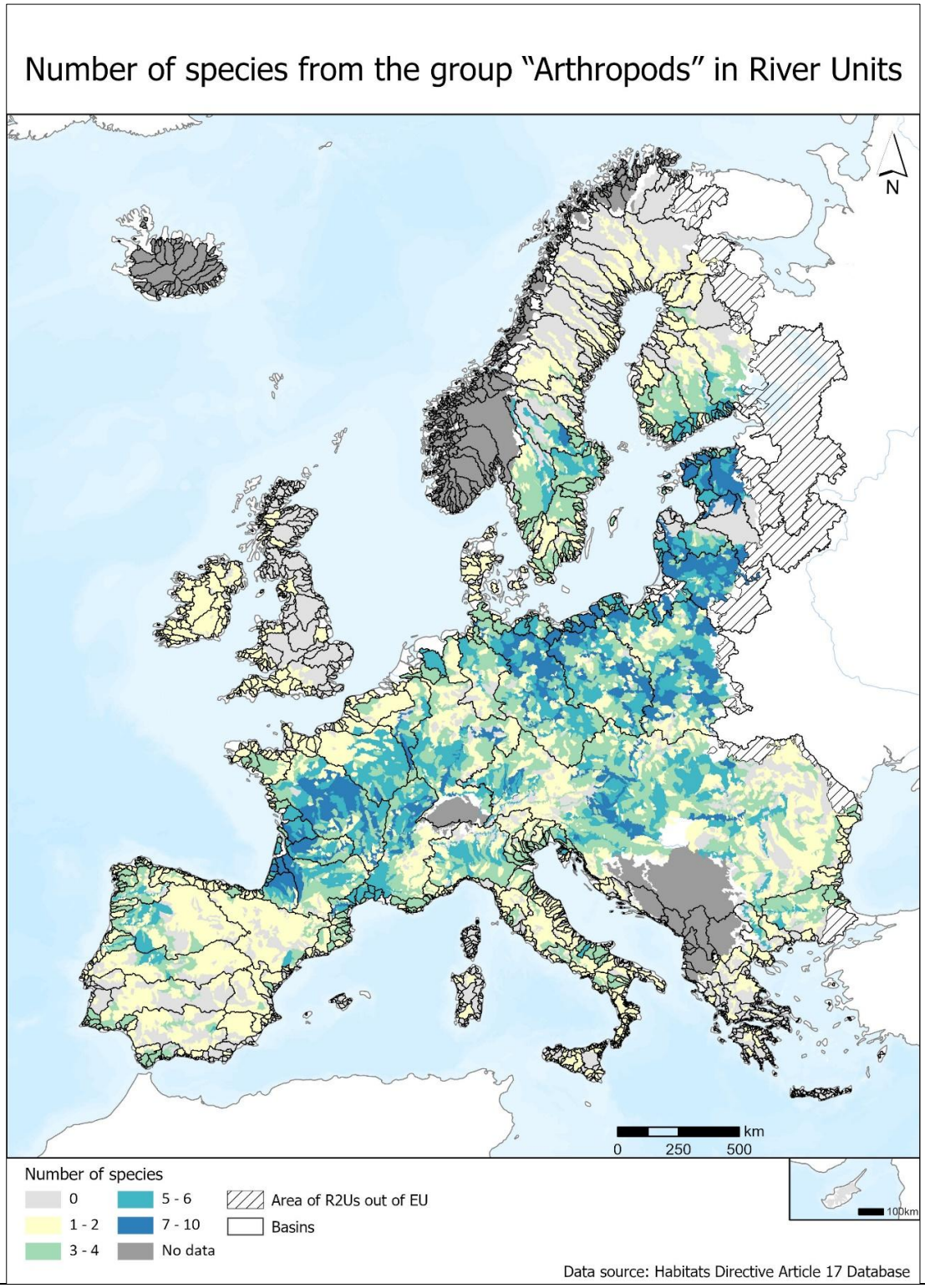
Description	Number of species from the group “Amphibians” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Aggregated composite indicator of conservation status for species from the group “Amphibians” in River Units.
	
Summary	Aggregated Composite Indicator ciCS of Species from the group “Amphibians” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0

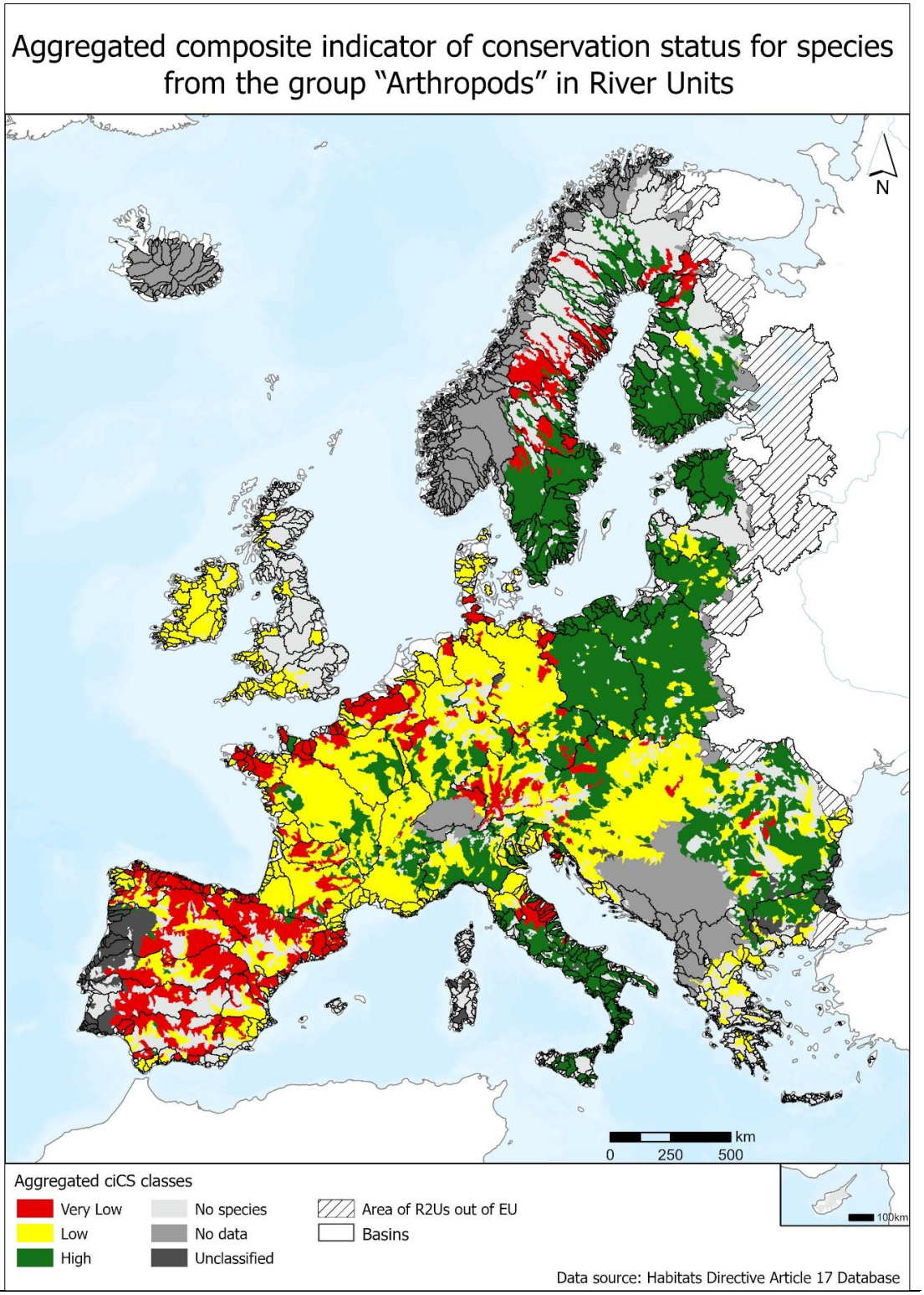
	Responsible: University of Lisbon
Description	Value of the aggregated Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Amphibians” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Detailed composite indicator of conservation status for species from the group “Amphibians” in River Units.
	
Summary	Detailed Composite Indicator ciCS of Species from the group “Amphibians” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

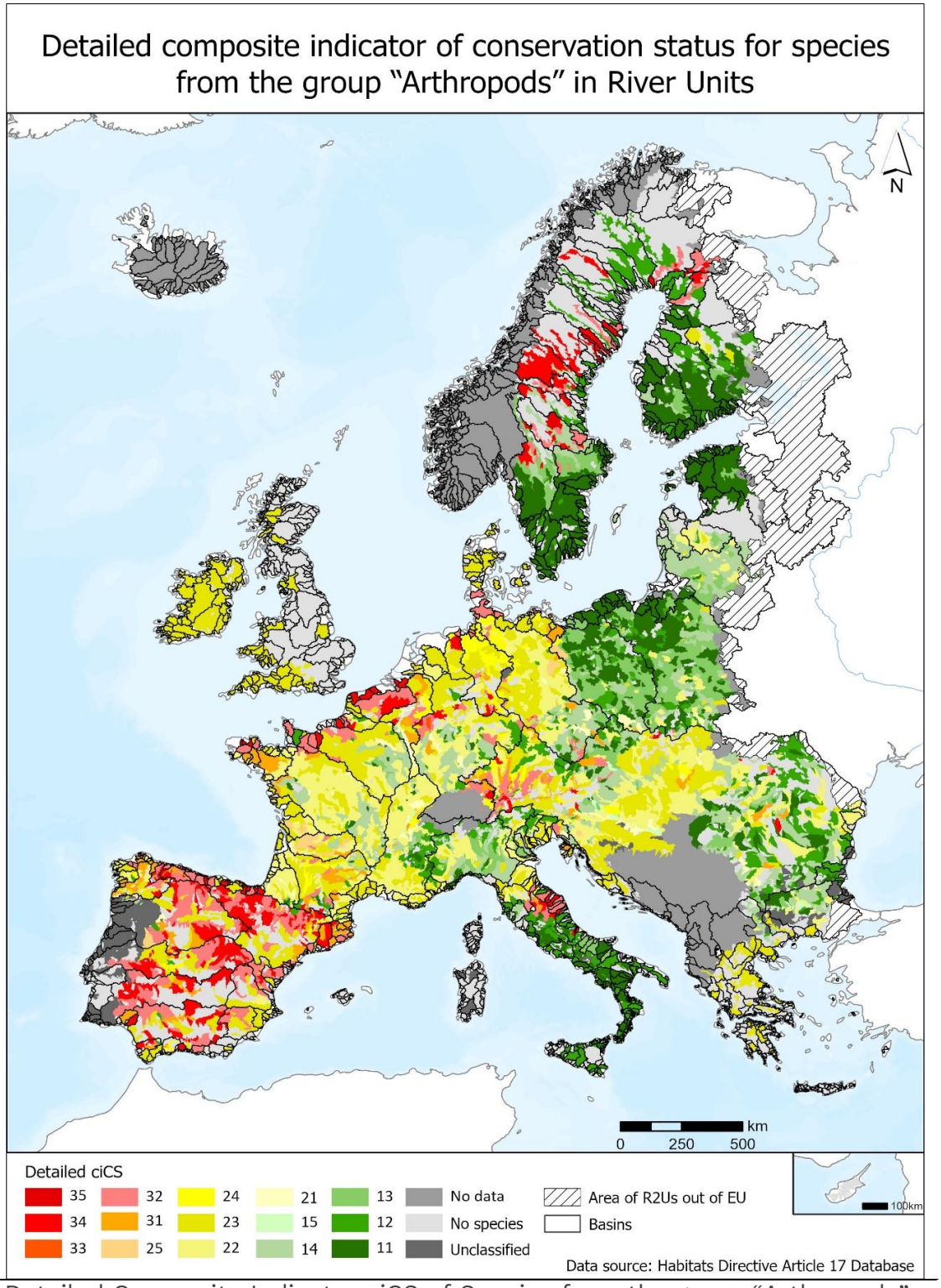
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Amphibians” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Number of species from the group “Arthropods” in River Units.
	
Summary	Number of species from the group from the group “Arthropods” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon
Description	Number of species from the group “Arthropods” present in the R2U.

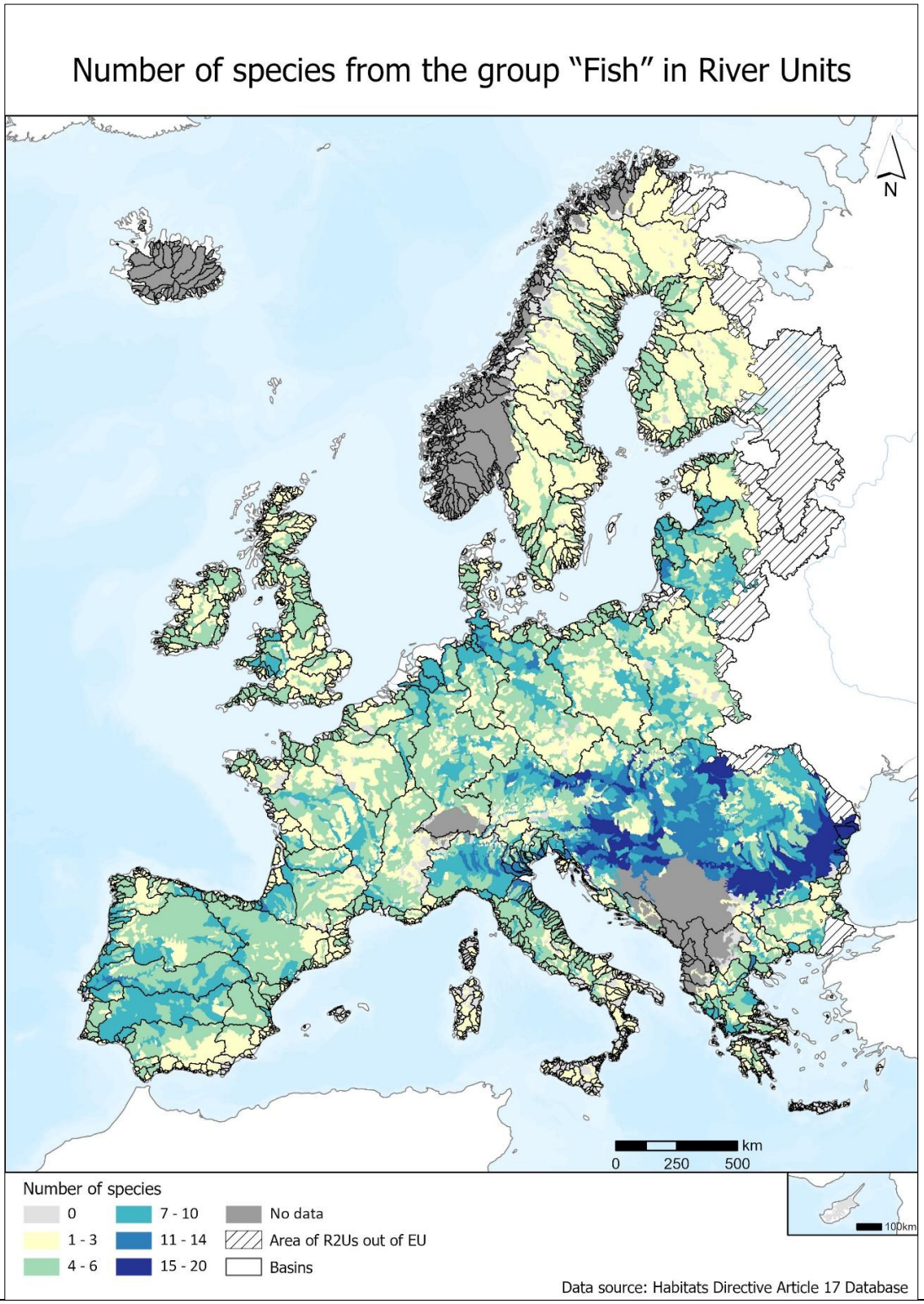
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Aggregated composite indicator of conservation status for species from the group “Arthropods” in River Units.
	
Summary	Aggregated Composite Indicator ciCS of Species from the group “Arthropods” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

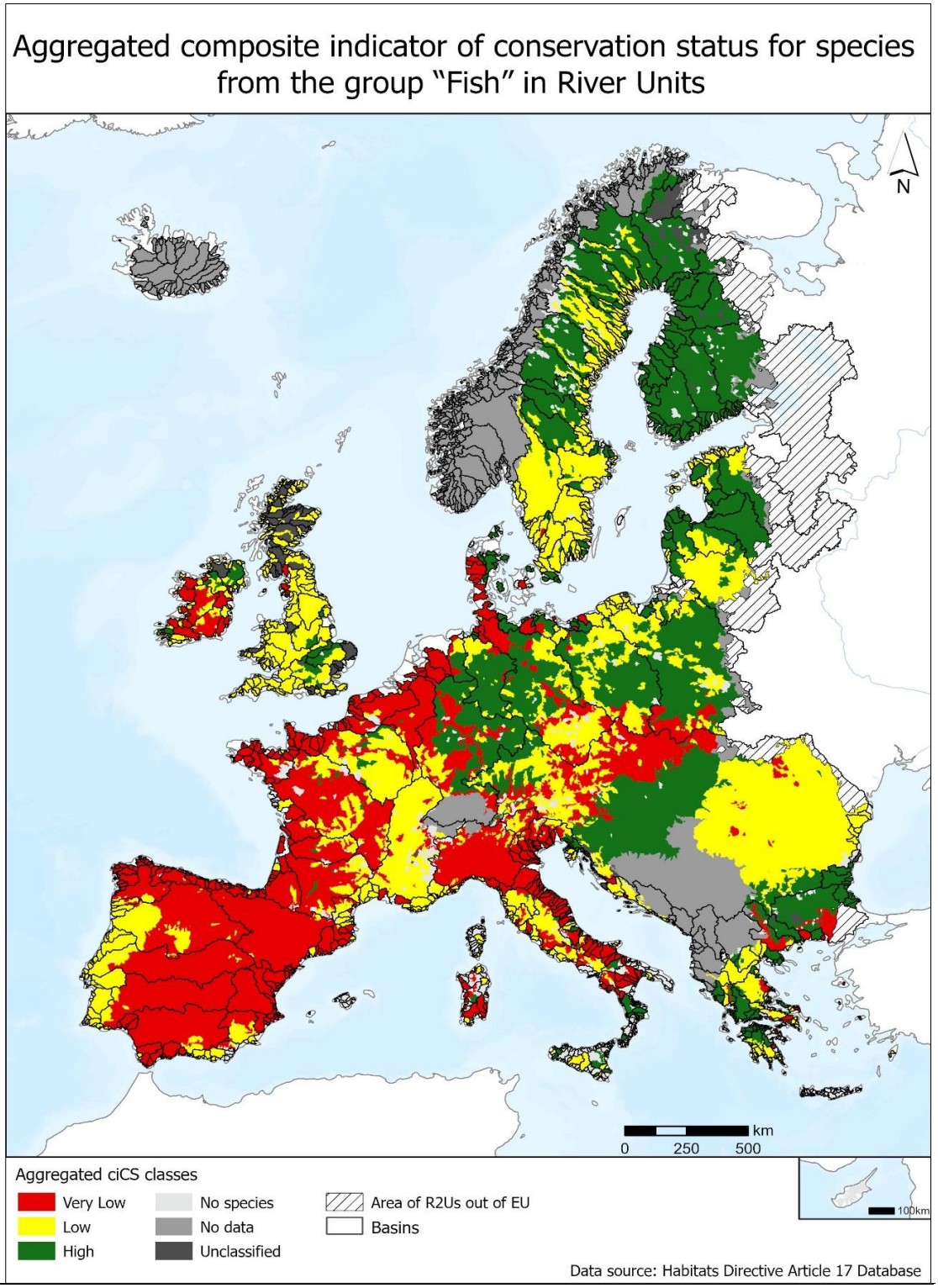
Description	Value of the aggregated Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Arthropods” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Detailed composite indicator of conservation status for species from the group “Arthropods” in River Units
	
Summary	Detailed Composite Indicator ciCS of Species from the group “Arthropods” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

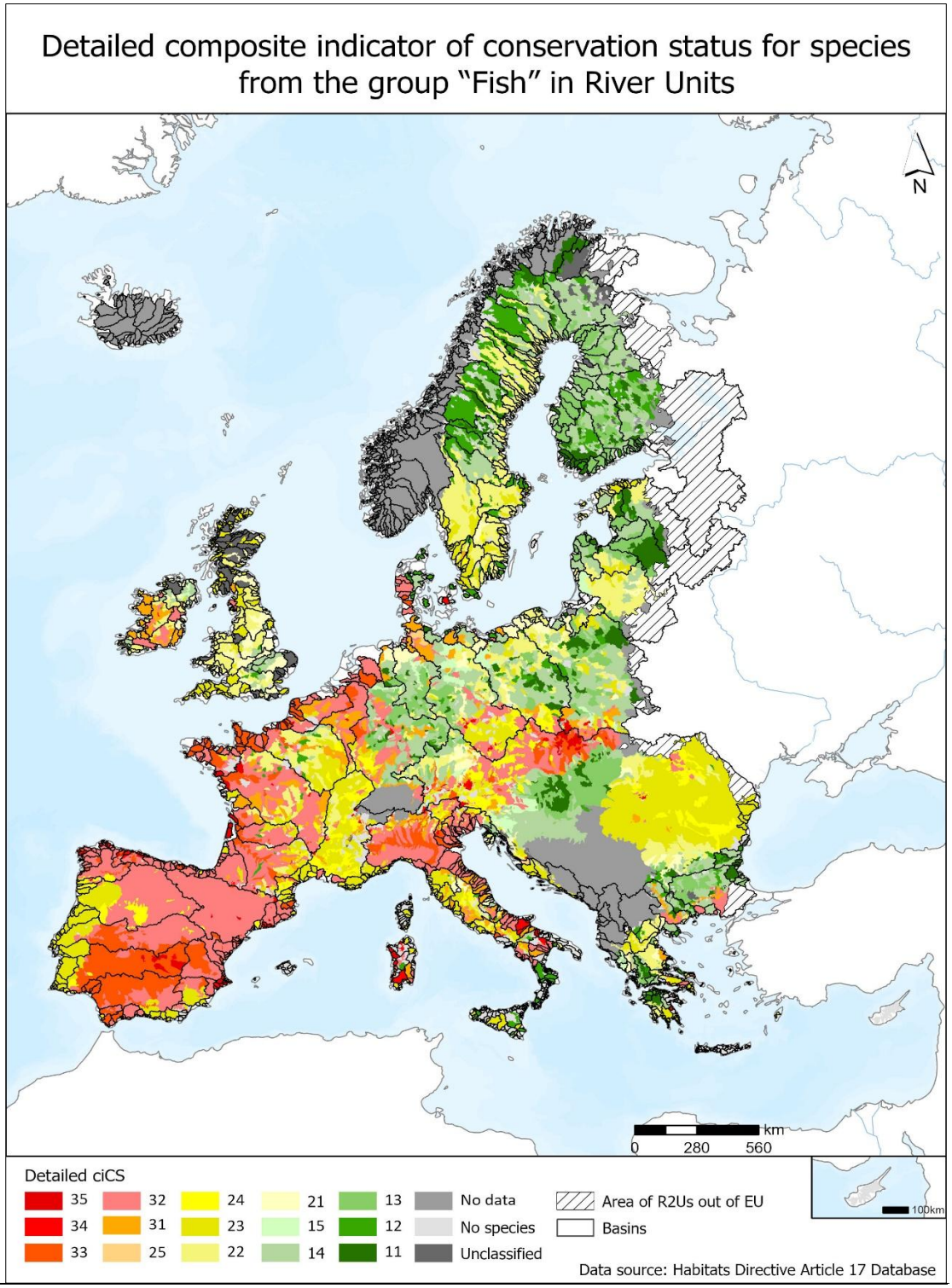
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Arthropods” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Number of species from the group “Fish” in River Units.
	
Summary	Number of species from the group from the group “Fish” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

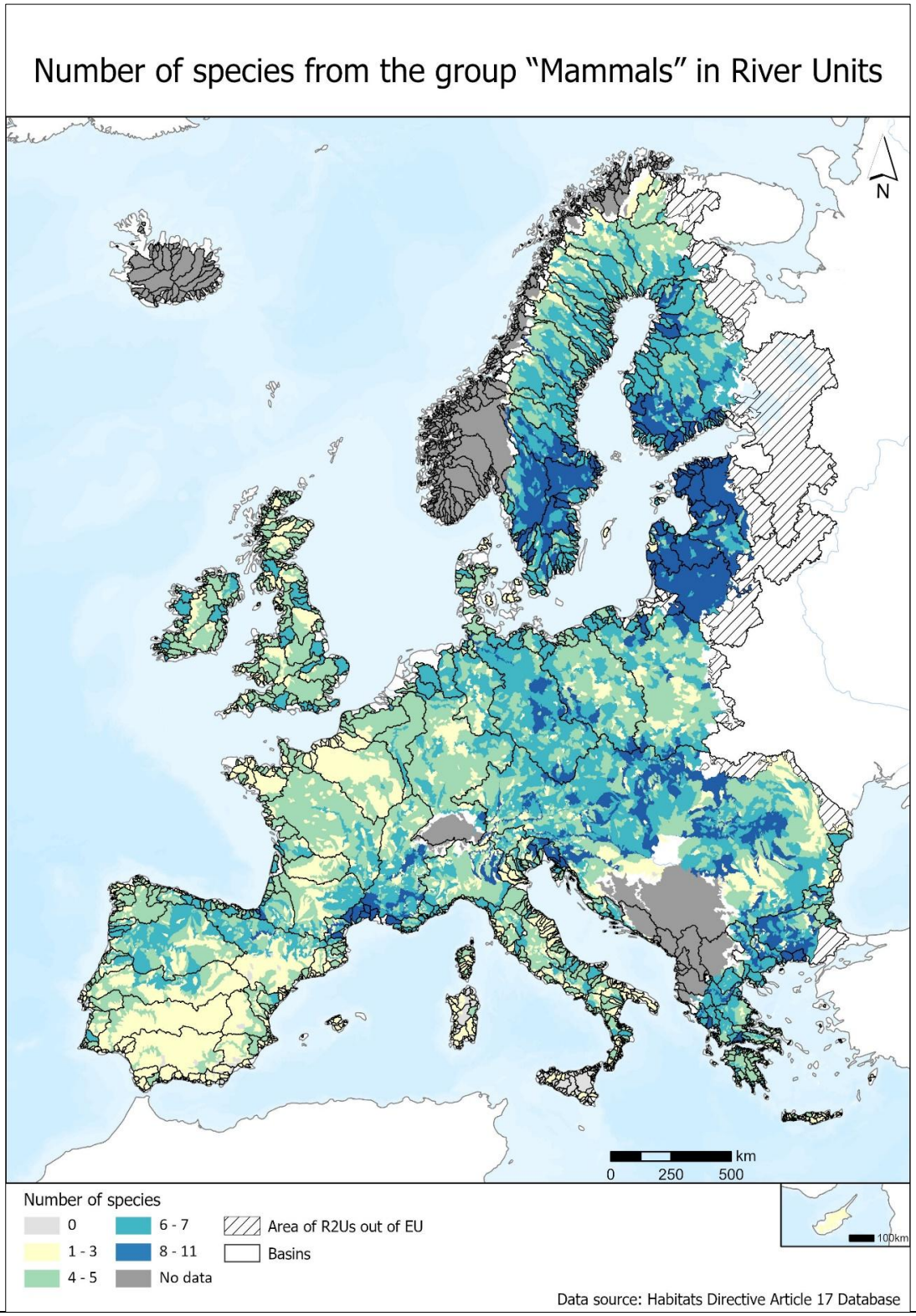
Description	Number of species from the group “Fish” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Aggregated composite indicator of conservation status for species from the group “Fish” in River Units.
	
Summary	Aggregated Composite Indicator ciCS of Species from the group “Fish” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

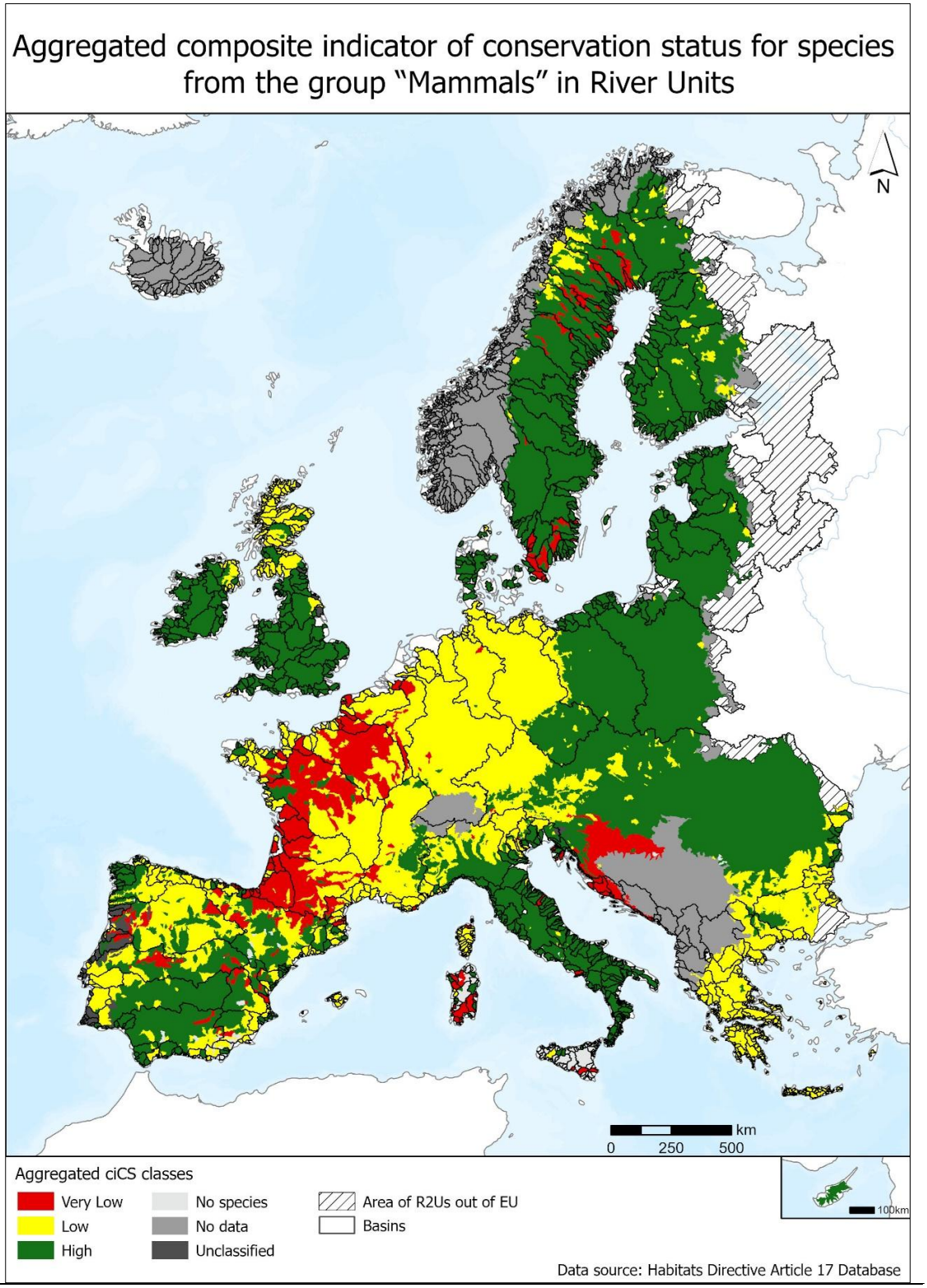
Description	Value of the aggregated Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Fish” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Detailed composite indicator of conservation status for species from the group “Fish” in River Units
	
Summary	Detailed Composite Indicator ciCS of Species from the group “Fish” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Fish” present in the R2U.

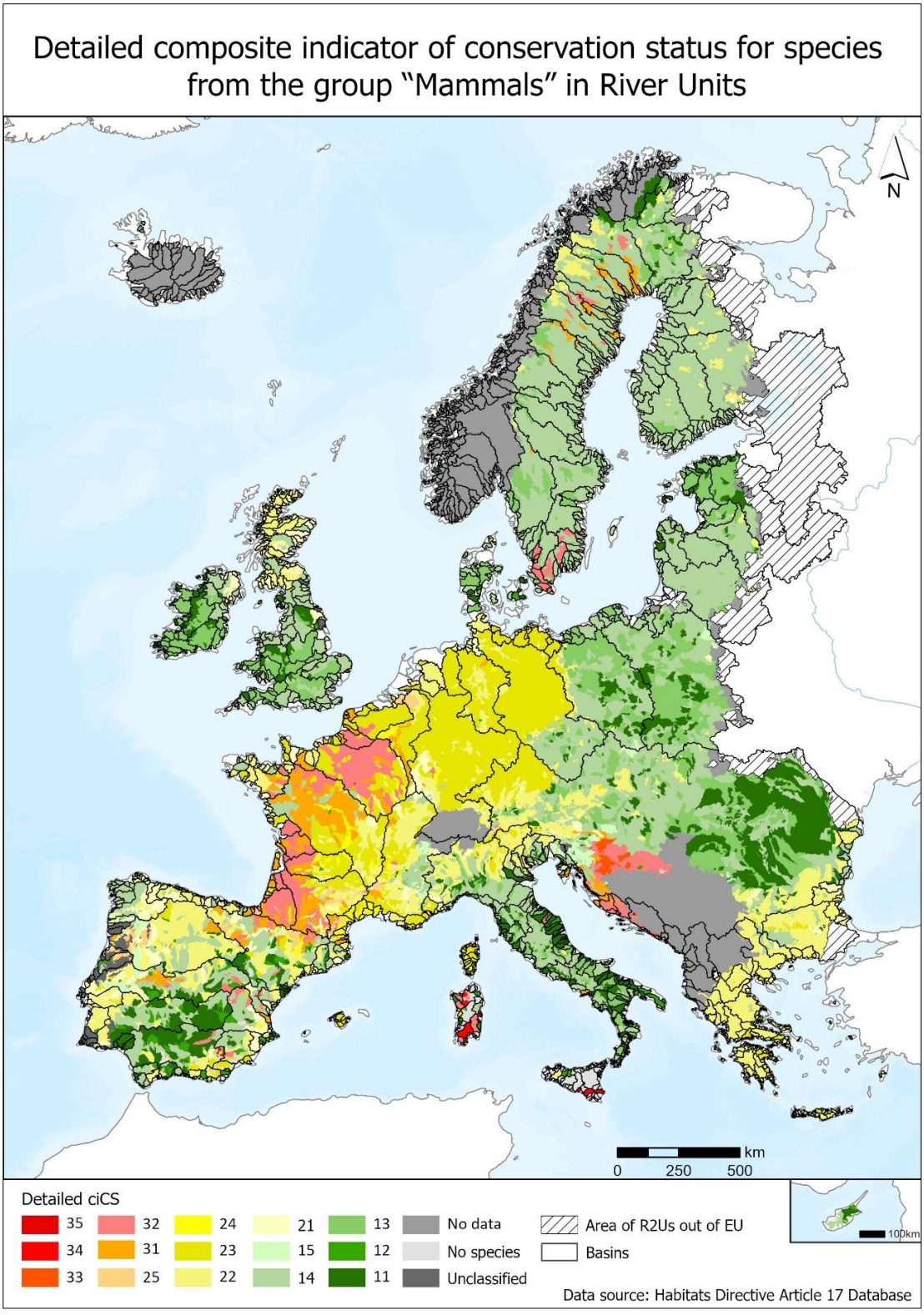
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Number of species from the group “Mammals” in River Units.
	
Summary	Number of species from the group from the group “Mammals” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

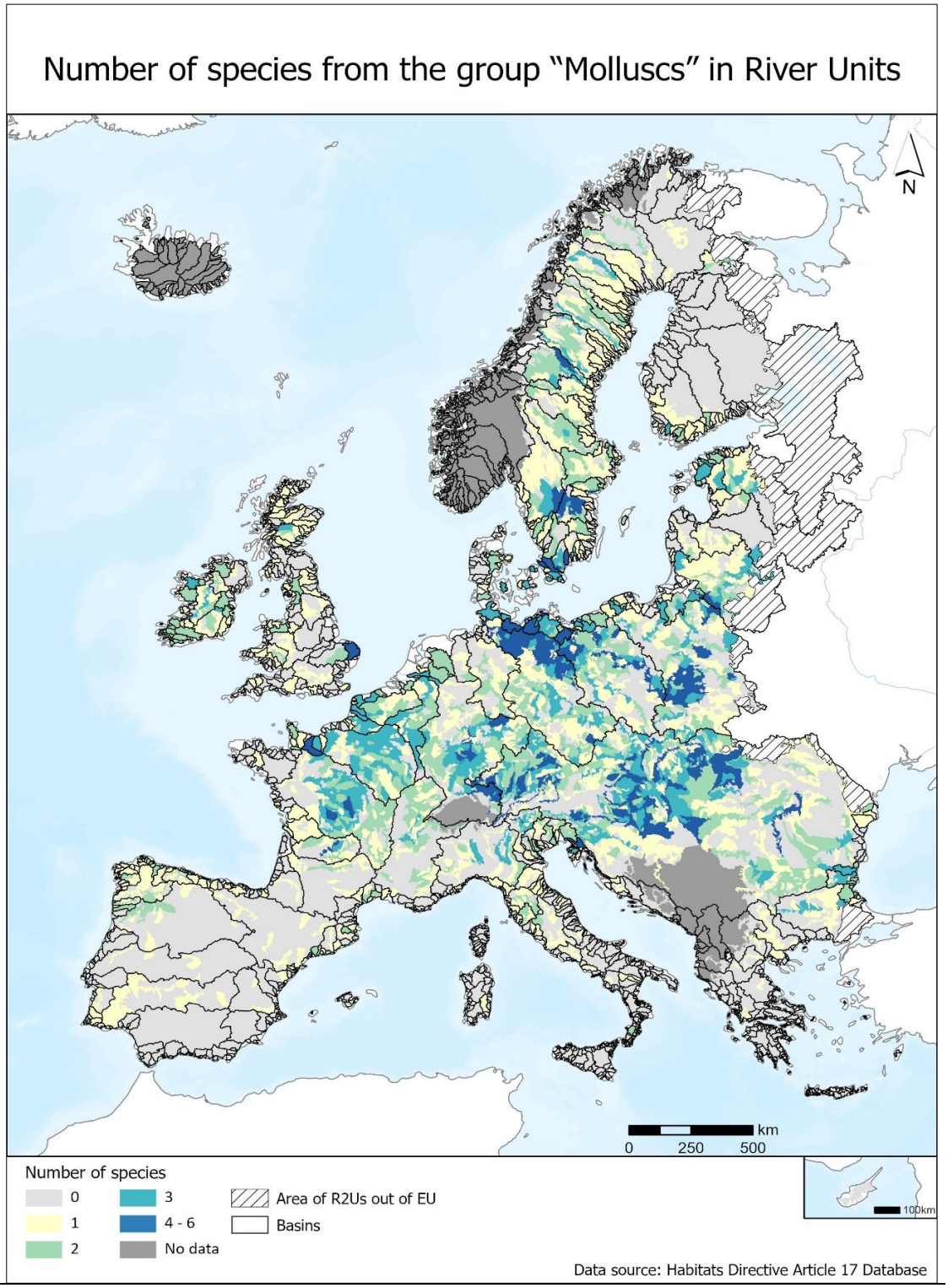
Description	Number of species from the group “Mammals” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Aggregated composite indicator of conservation status for species from the group “Mammals” in River Units.
	
Summary	Aggregated Composite Indicator ciCS of Species from the group “Mammals” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclu sion in this DB) Resolution: R2U Version: 3.0

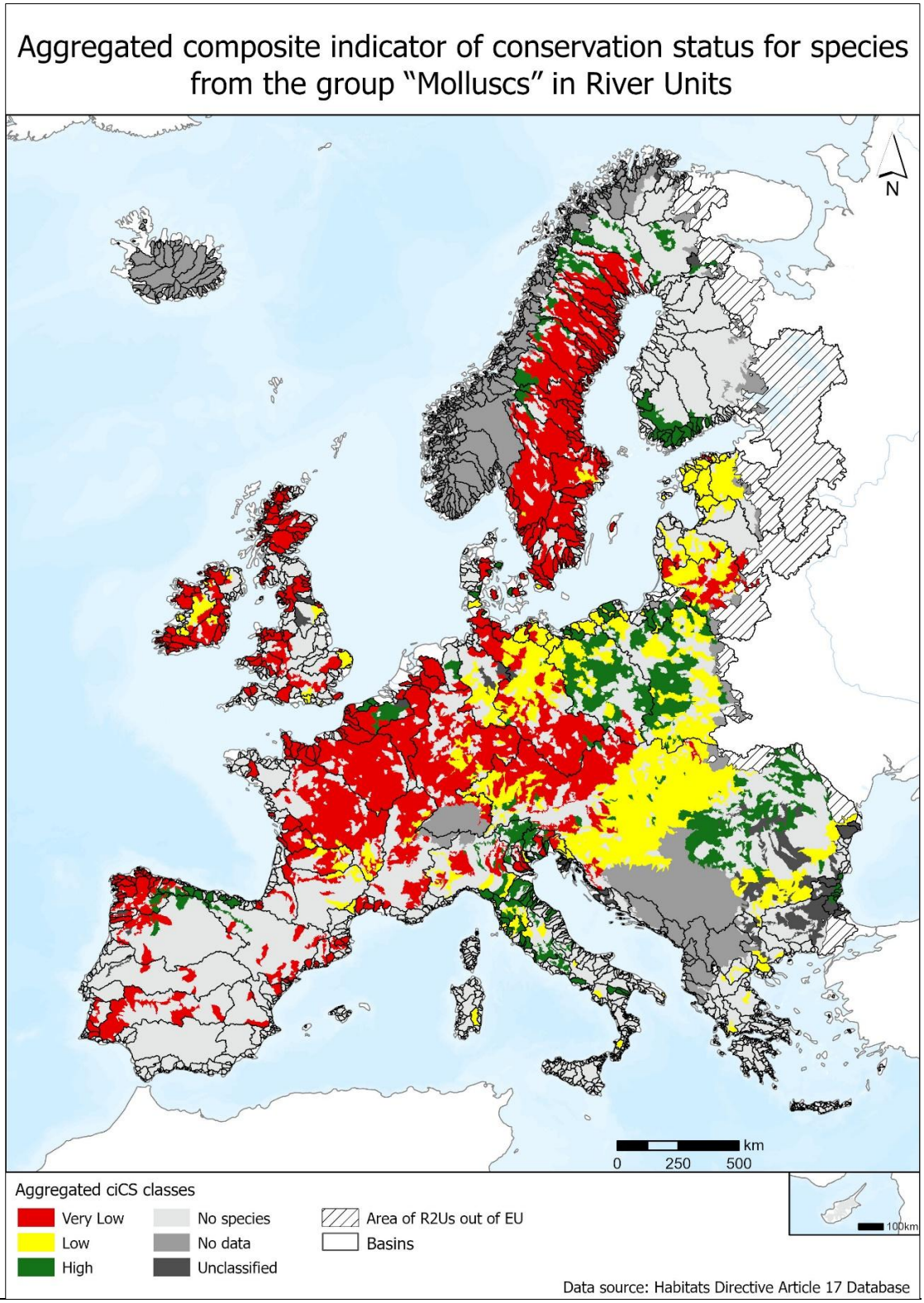
	Responsible: University of Lisbon
Description	Value of the aggregated Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Mammals” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Detailed composite indicator of conservation status for species from the group “Mammals” in River Units
	
Summary	Detailed Composite Indicator ciCS of Species from the group “Mammals” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U

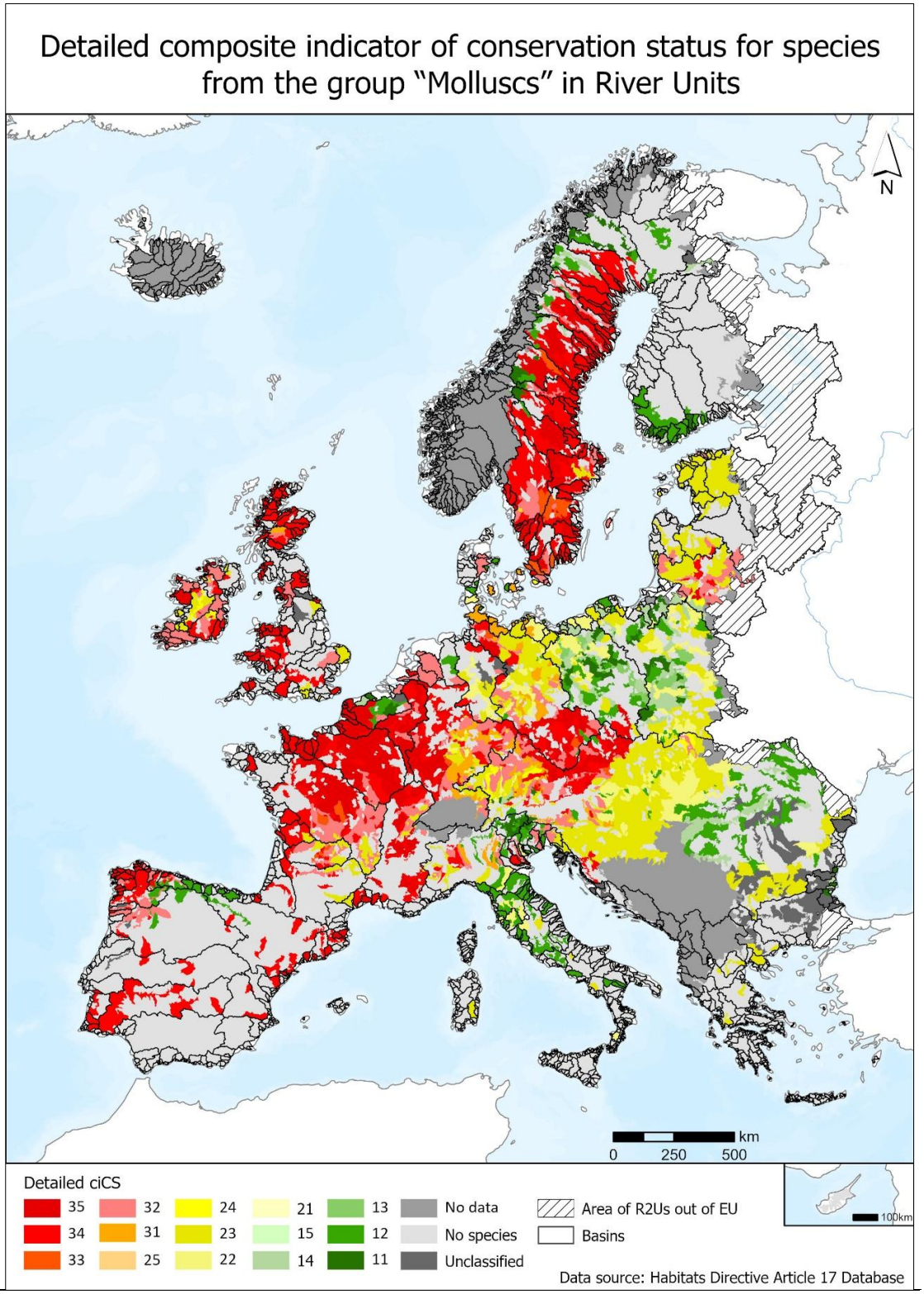
	Version: 3.0 Responsible: University of Lisbon
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Mammals” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Number of species from the group “Molluscs” in River Units.
	
Summary	Number of species from the group from the group “Molluscs” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon
Description	Number of species from the group “Molluscs” present in the R2U.

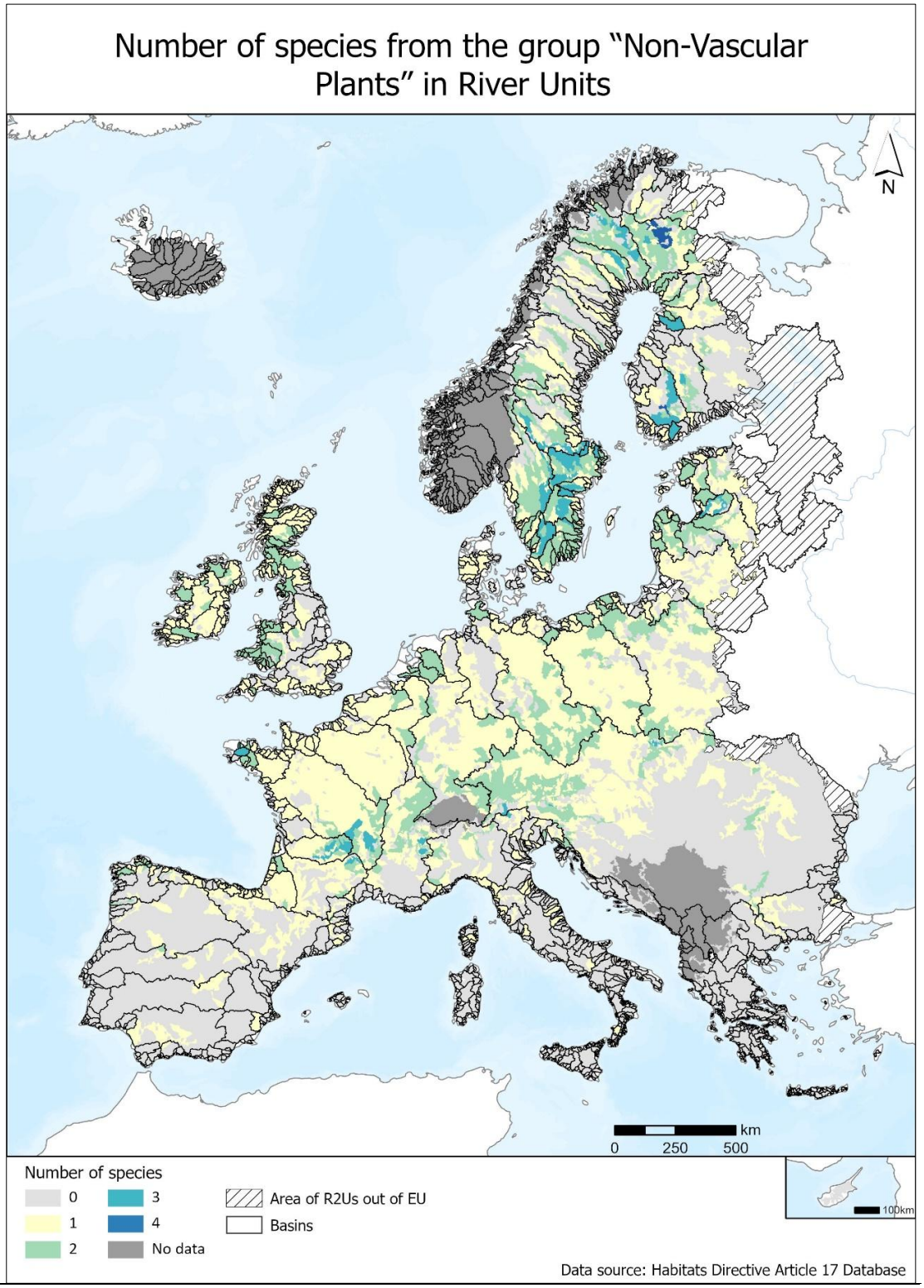
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Aggregated composite indicator of conservation status for species from the group “Molluscs” in River Units.
	
Summary	Aggregated Composite Indicator ciCS of Species from the group “Molluscs” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

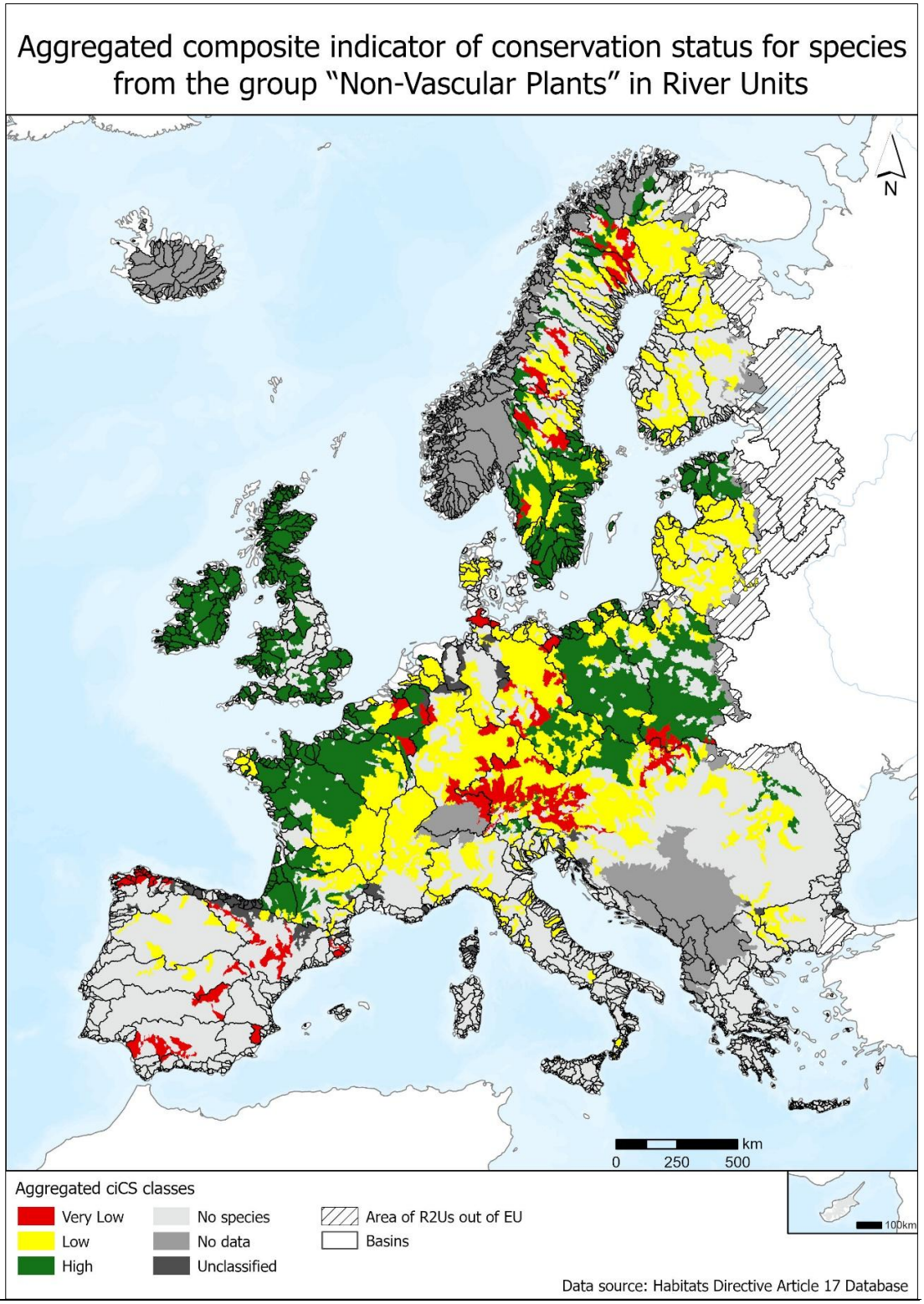
Description	Value of the aggregated Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Molluscs” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Detailed composite indicator of conservation status for species from the group “Molluscs” in River Units
	
Summary	Detailed Composite Indicator ciCS of Species from the group “Molluscs” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

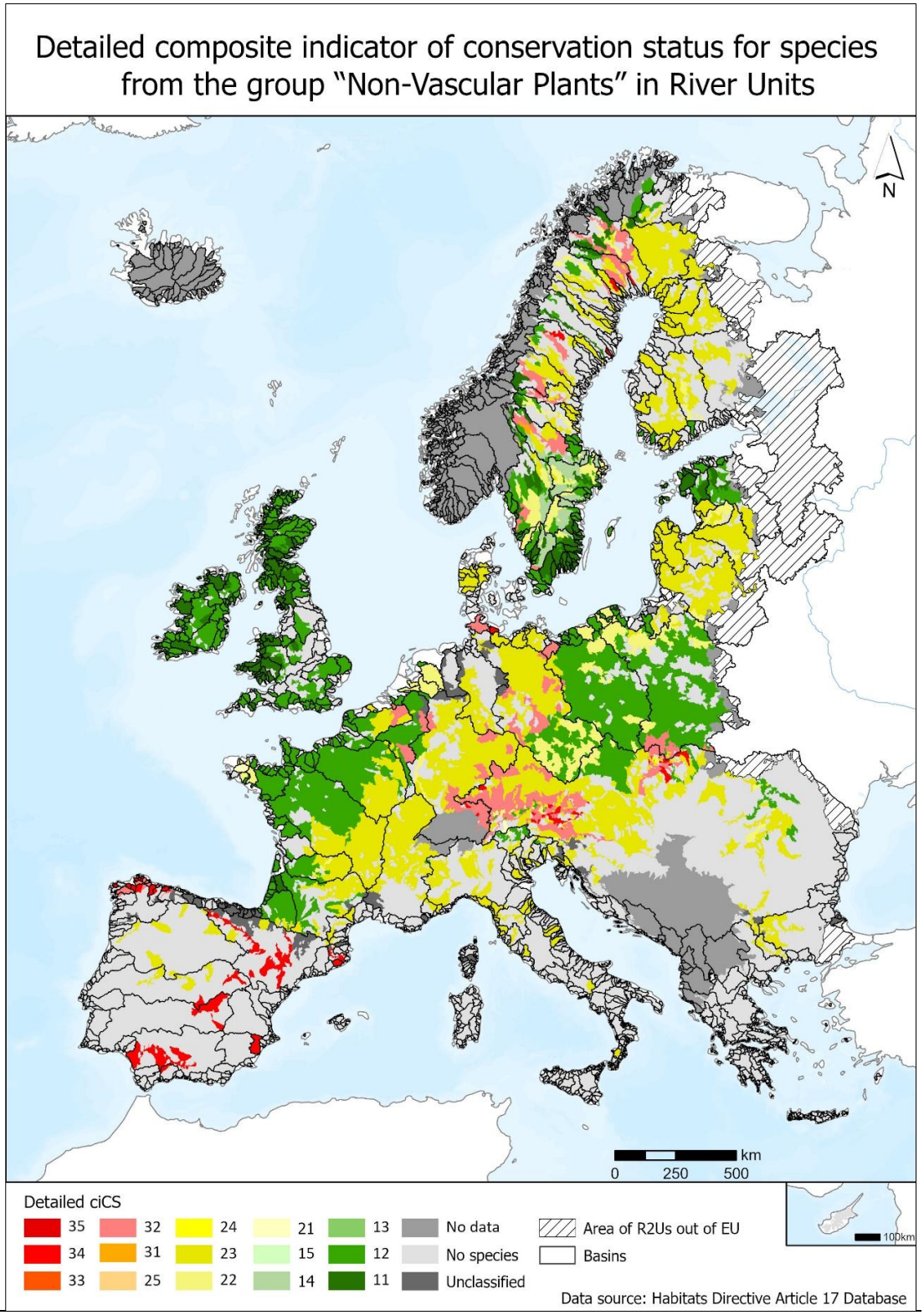
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Molluscs” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Number of species from the group “Non-Vascular Plants” in River Units.
	
Summary	Number of species from the group from the group “Non-Vascular Plants” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

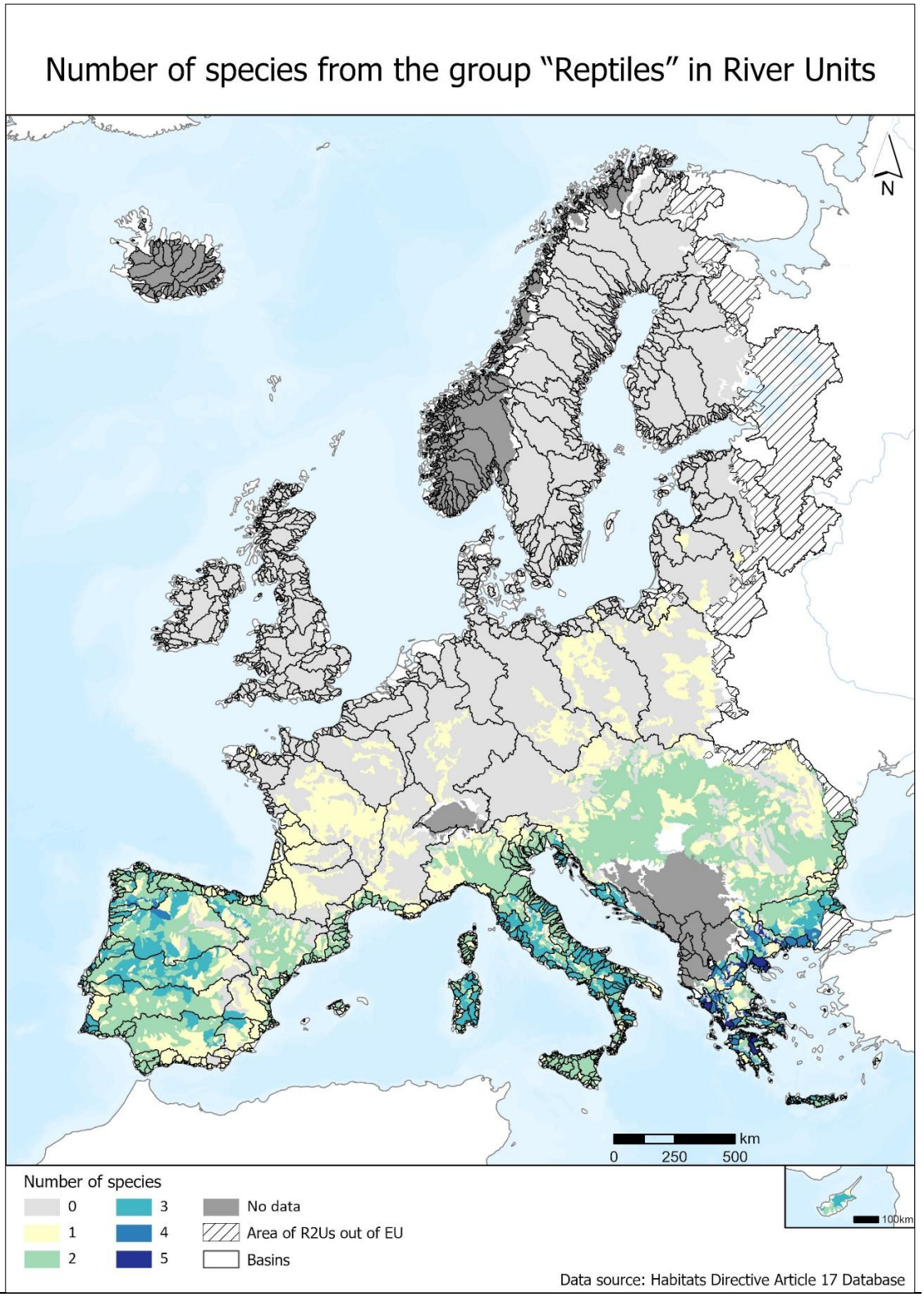
Description	Number of species from the group “Non-Vascular Plants” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Aggregated composite indicator of conservation status for species from the group “Non-Vascular Plants” in River Units.
	
Summary	Aggregated Composite Indicator ciCS of Species from the group “Non-Vascular Plants” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0

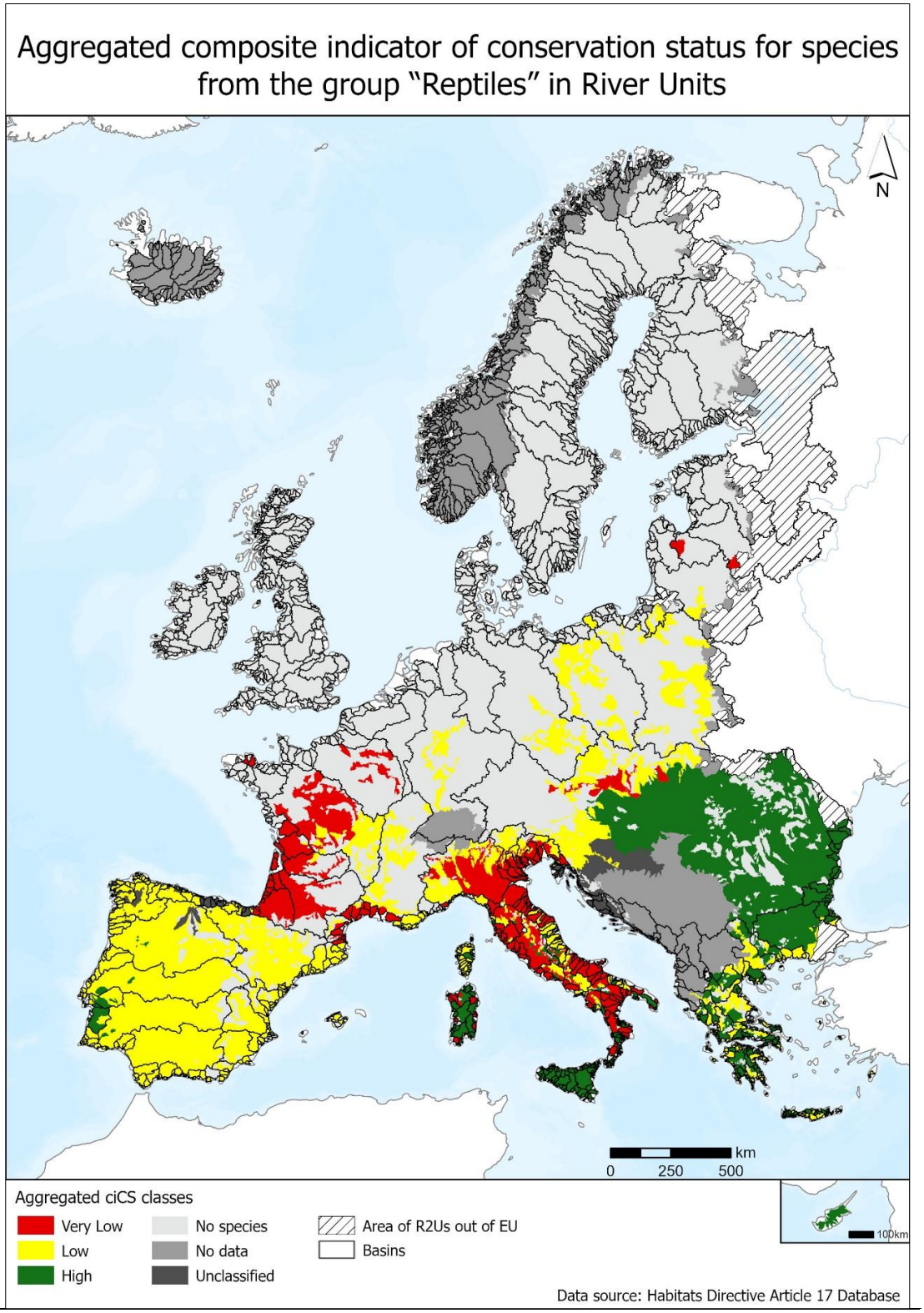
	Responsible: University of Lisbon
Description	Value of the aggregated Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Non-Vascular Plants” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Detailed composite indicator of conservation status for species from the group “Non-Vascular Plants” in River Units
	
Summary	Detailed Composite Indicator ciCS of Species from the group “Non-Vascular Plants” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0

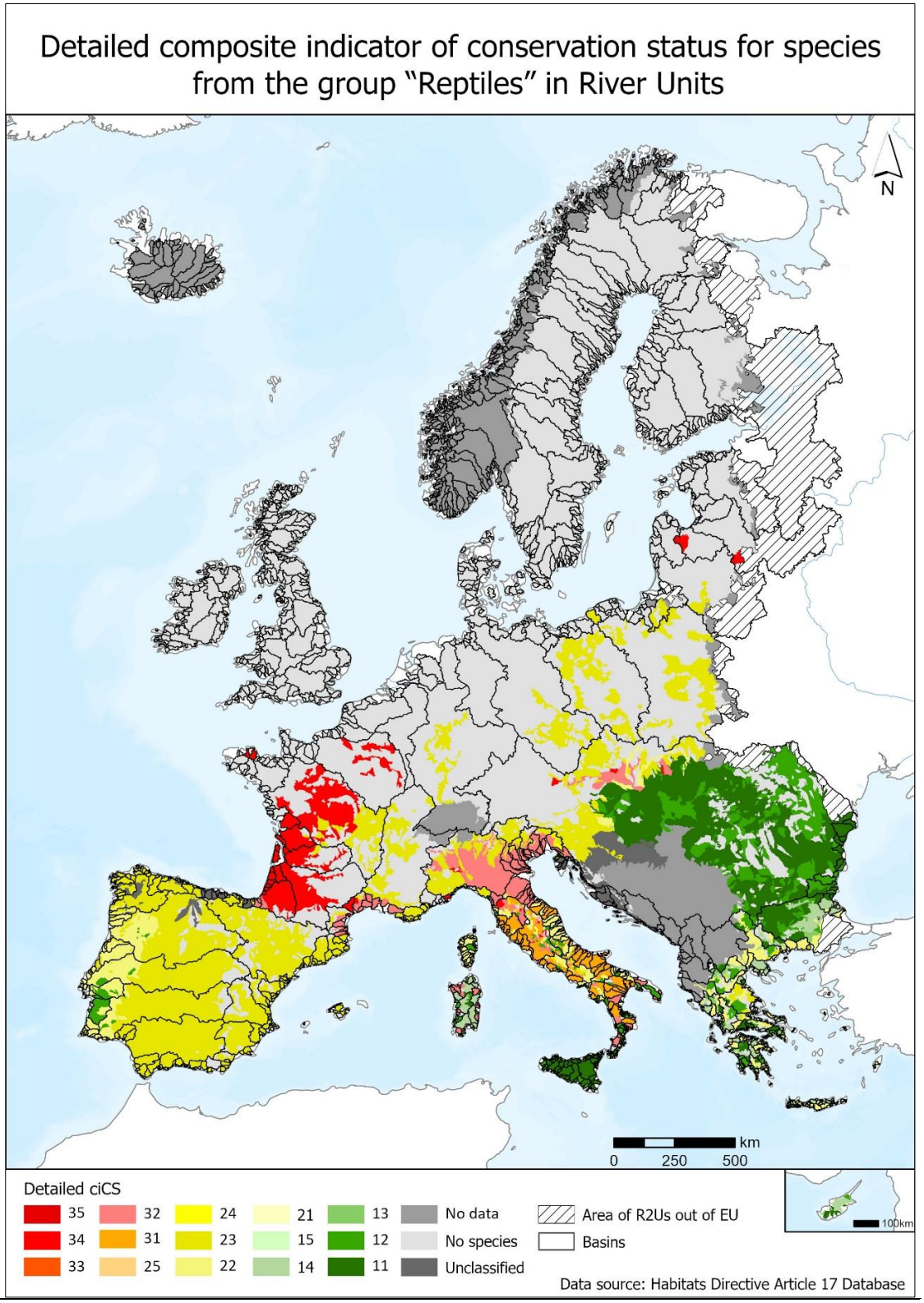
	Responsible: University of Lisbon
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Non-Vascular Plants” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Number of species from the group “Reptiles” in River Units.
	
Summary	Number of species from the group from the group “Reptiles” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

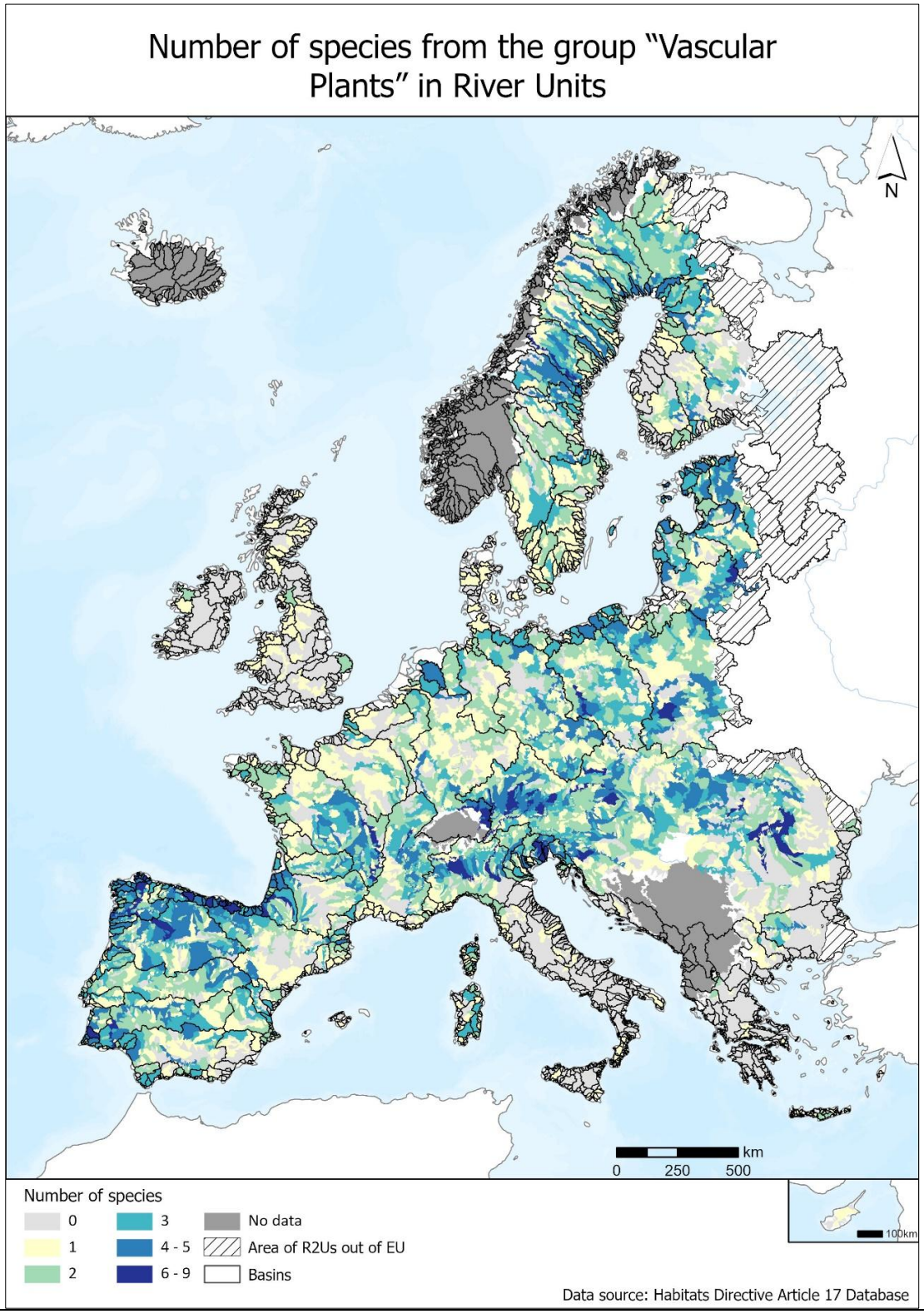
Description	Number of species from the group “Reptiles” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Aggregated composite indicator of conservation status for species from the group “Reptiles” in River Units.
	
Summary	Aggregated Composite Indicator ciCS of Species from the group “Reptiles” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

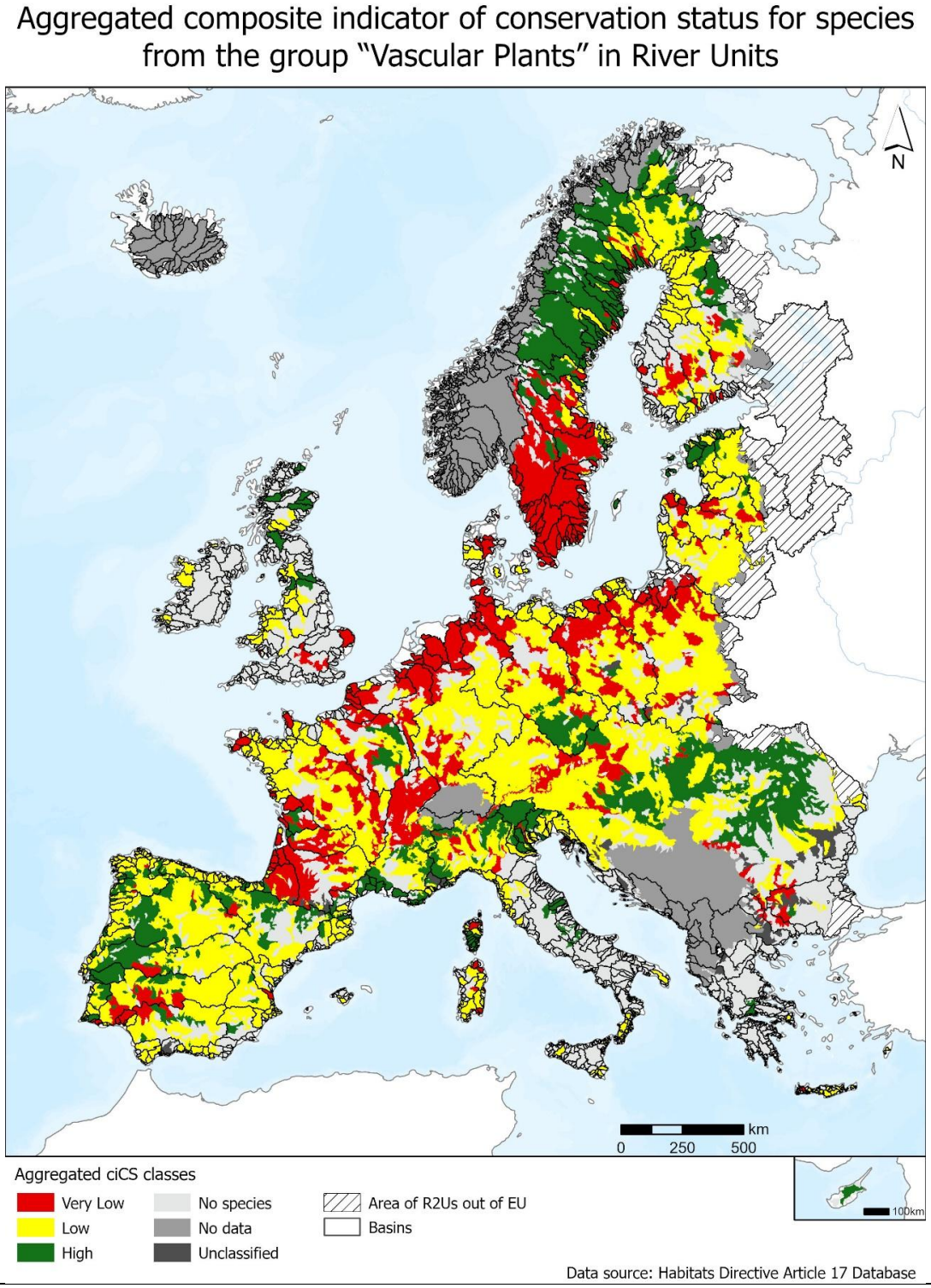
Description	Value of the aggregated Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Reptiles” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Detailed composite indicator of conservation status for species from the group “Reptiles” in River Units
	
Summary	Detailed Composite Indicator ciCS of Species from the group “Reptiles” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

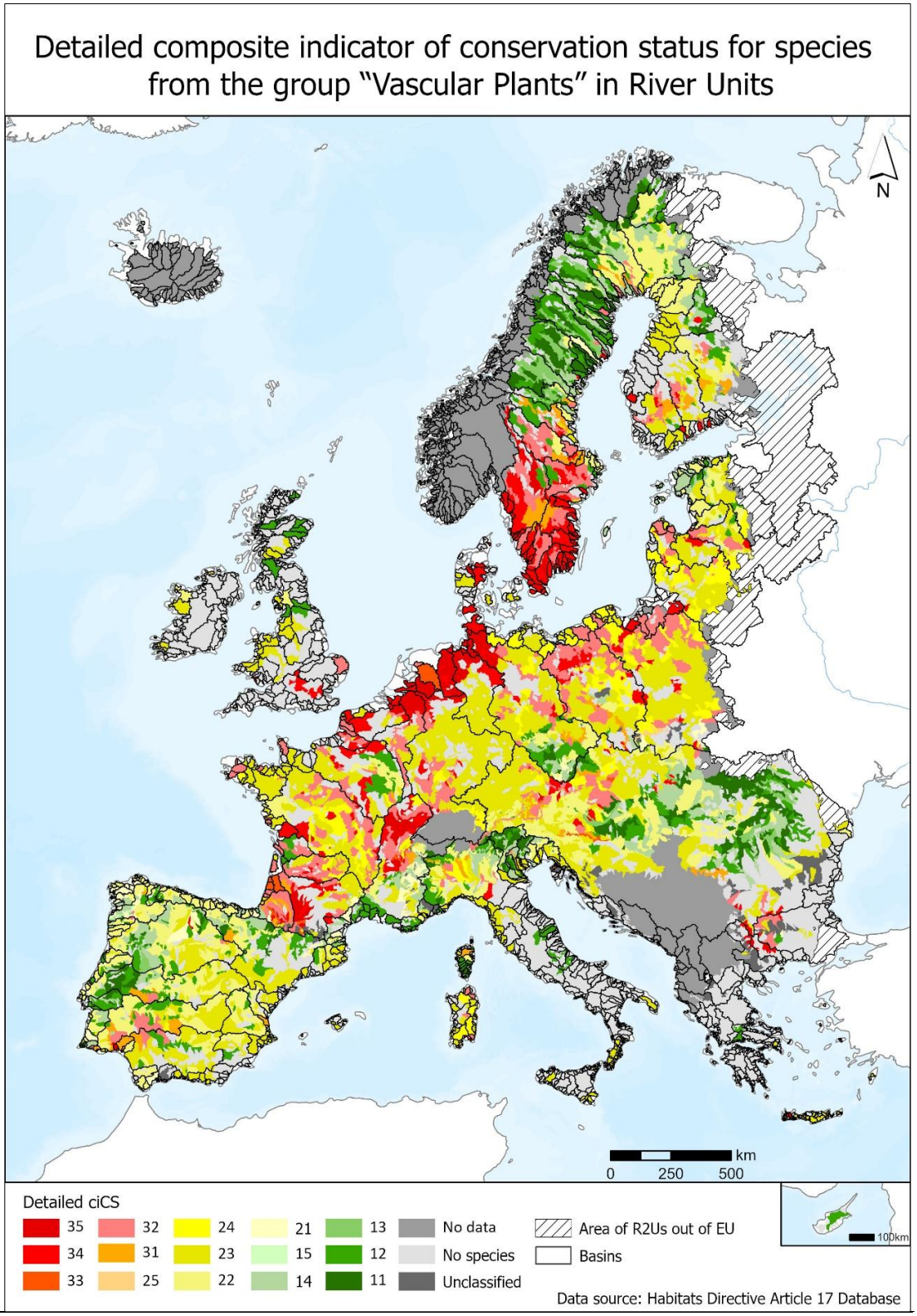
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Reptiles” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Number of species from the group “Vascular Plants” in River Units.
	
Summary	Number of species from the group from the group “Vascular Plants” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

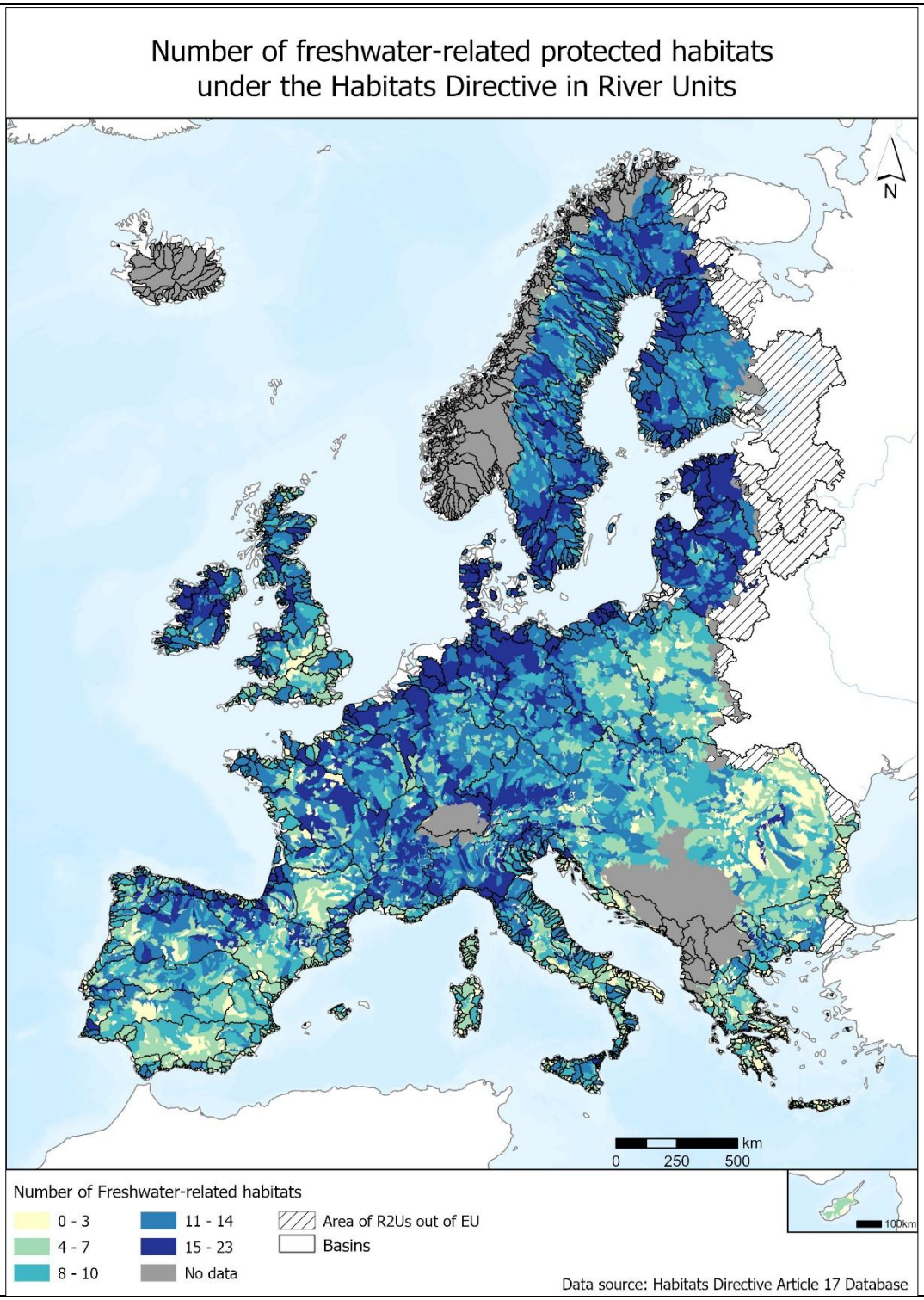
Description	Number of species from the group “Vascular Plants” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Aggregated composite indicator of conservation status for species from the group “Vascular Plants” in River Units.
	
Summary	Aggregated Composite Indicator ciCS of Species from the group “Vascular Plants” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

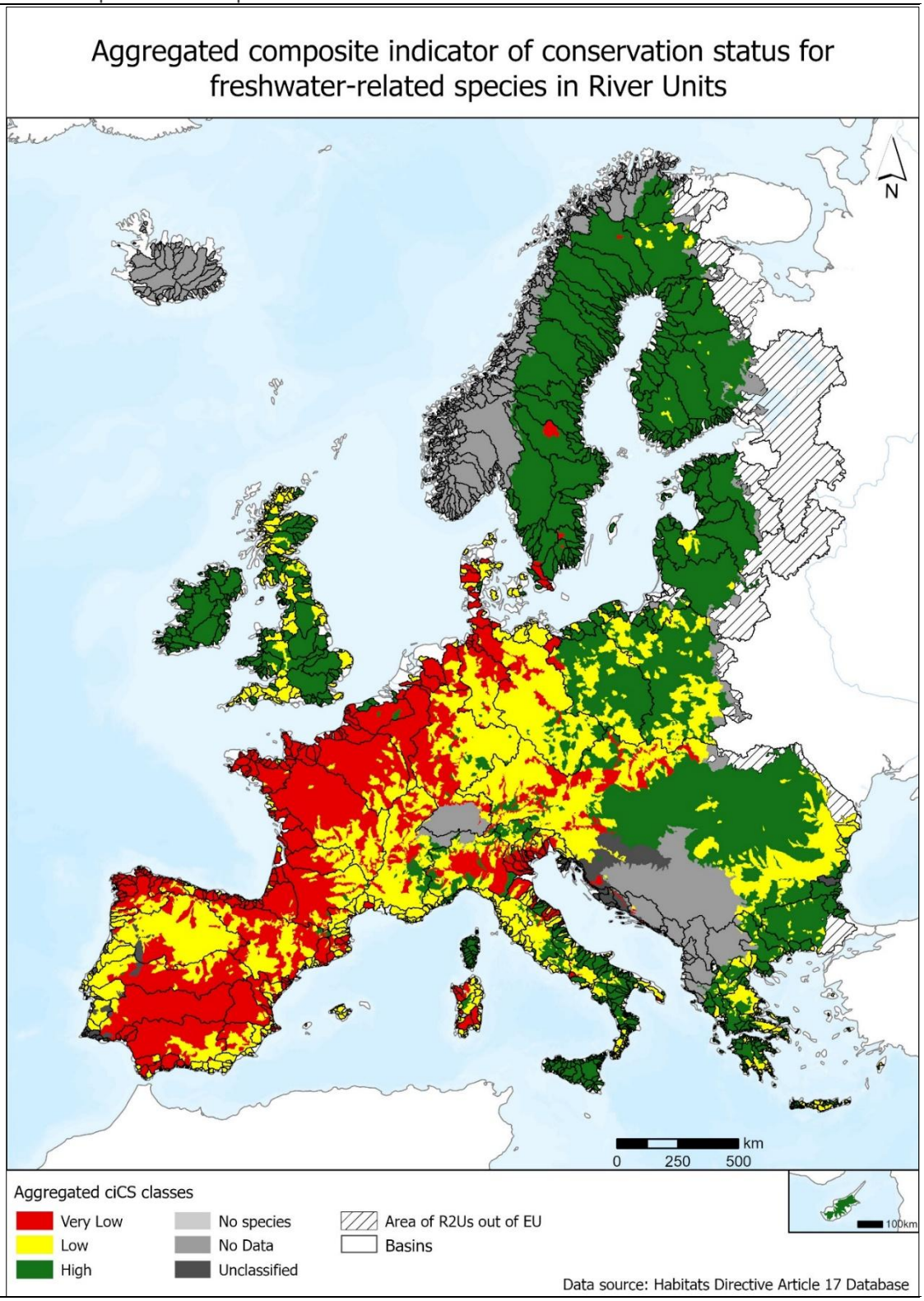
Description	Value of the aggregated Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Vascular Plants” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Detailed composite indicator of conservation status for species from the group “Vascular Plants” in River Units
	
Summary	Detailed Composite Indicator ciCS of Species from the group “Vascular Plants” from article 17 of the Habitats Directive in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0

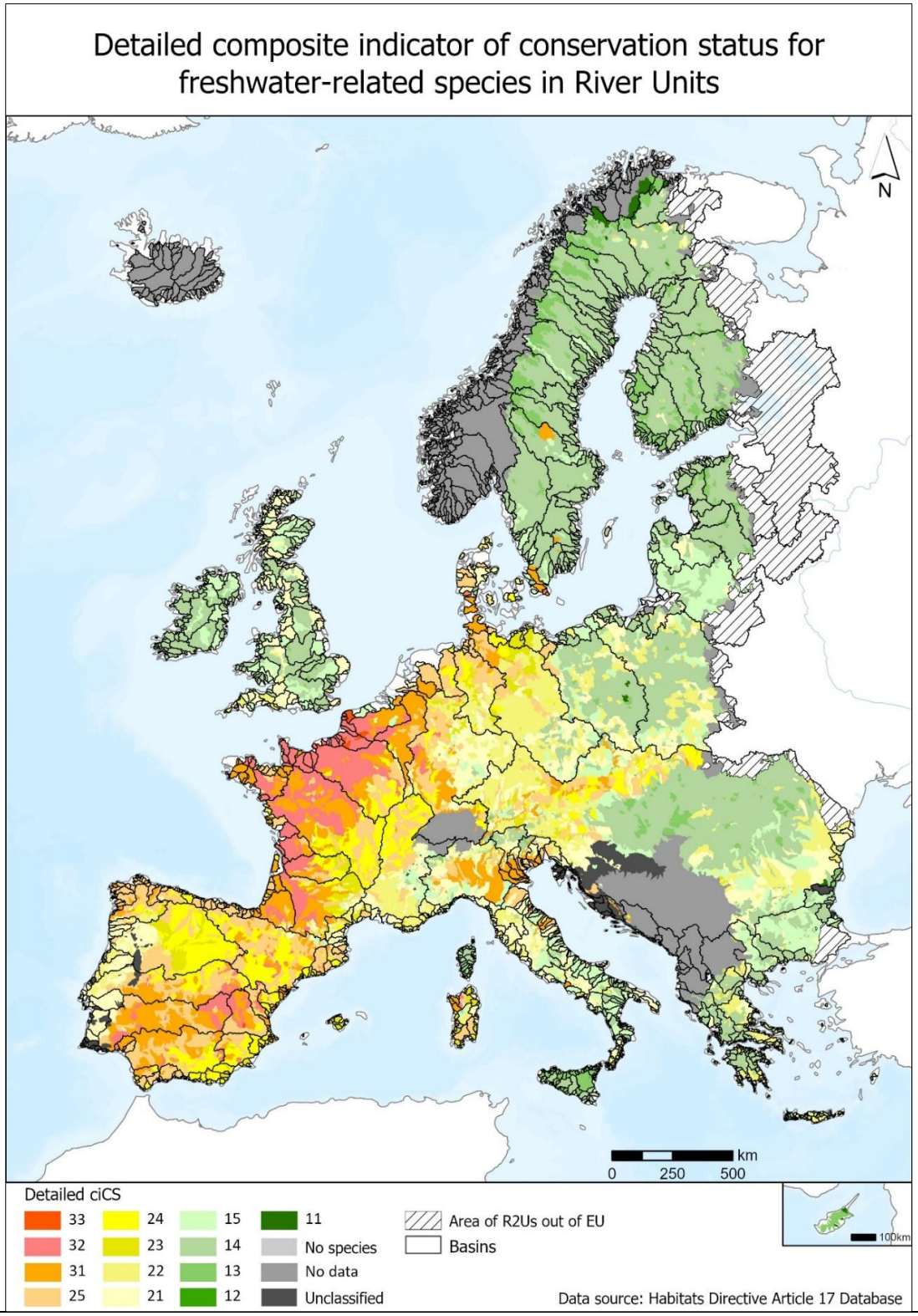
	Responsible: University of Lisbon
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the species belonging to the group “Vascular Plants” present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Number of freshwater-related protected species under the Habitats Directive in River Units
.	
Summary	The number of overall freshwater-related species from article 17 of the Habitats Directive present in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0 Responsible: University of Lisbon

Description	Number of overall Species present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

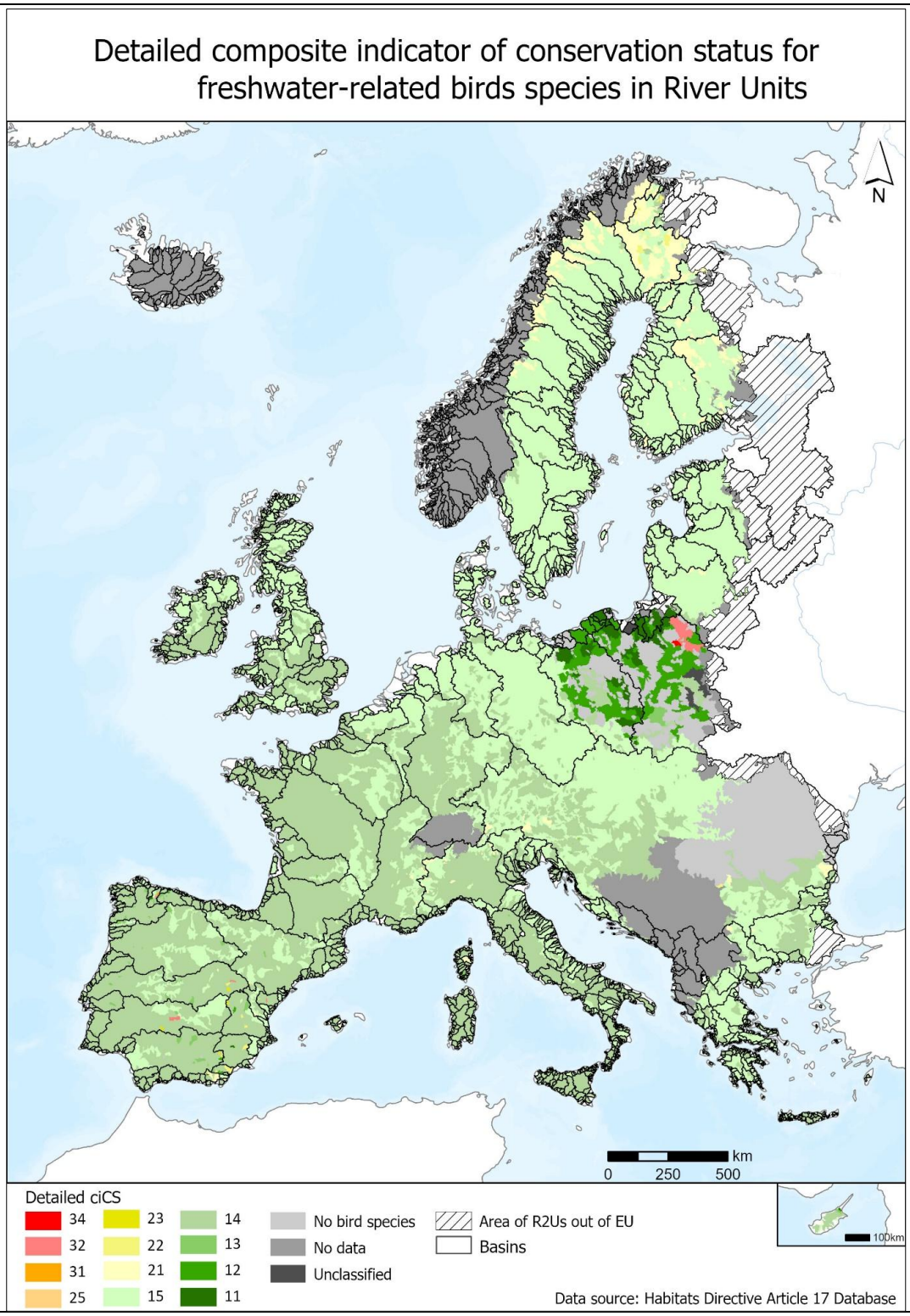
Title	Aggregated composite indicator of conservation status for freshwater-related protected species under the Habitats Directive in River Units
	
Summary	The aggregated Composite Indicator of Conservation Status (ciCS) for the overall freshwater-related species from article 17 of the Habitats Directive present in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U

	Version: 3.0 Responsible: University of Lisbon
Description	Value of the aggregated Composite Indicator of Conservation Status (ciCS) considering the overall Species present in the R2U..
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Title	Detailed composite indicator of conservation status for freshwater-related protected species under the Habitats Directive in River Units
	
Summary	The detailed Composite Indicator of Conservation Status (ciCS) for the overall freshwater-related species from article 17 of the Habitats Directive present in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U

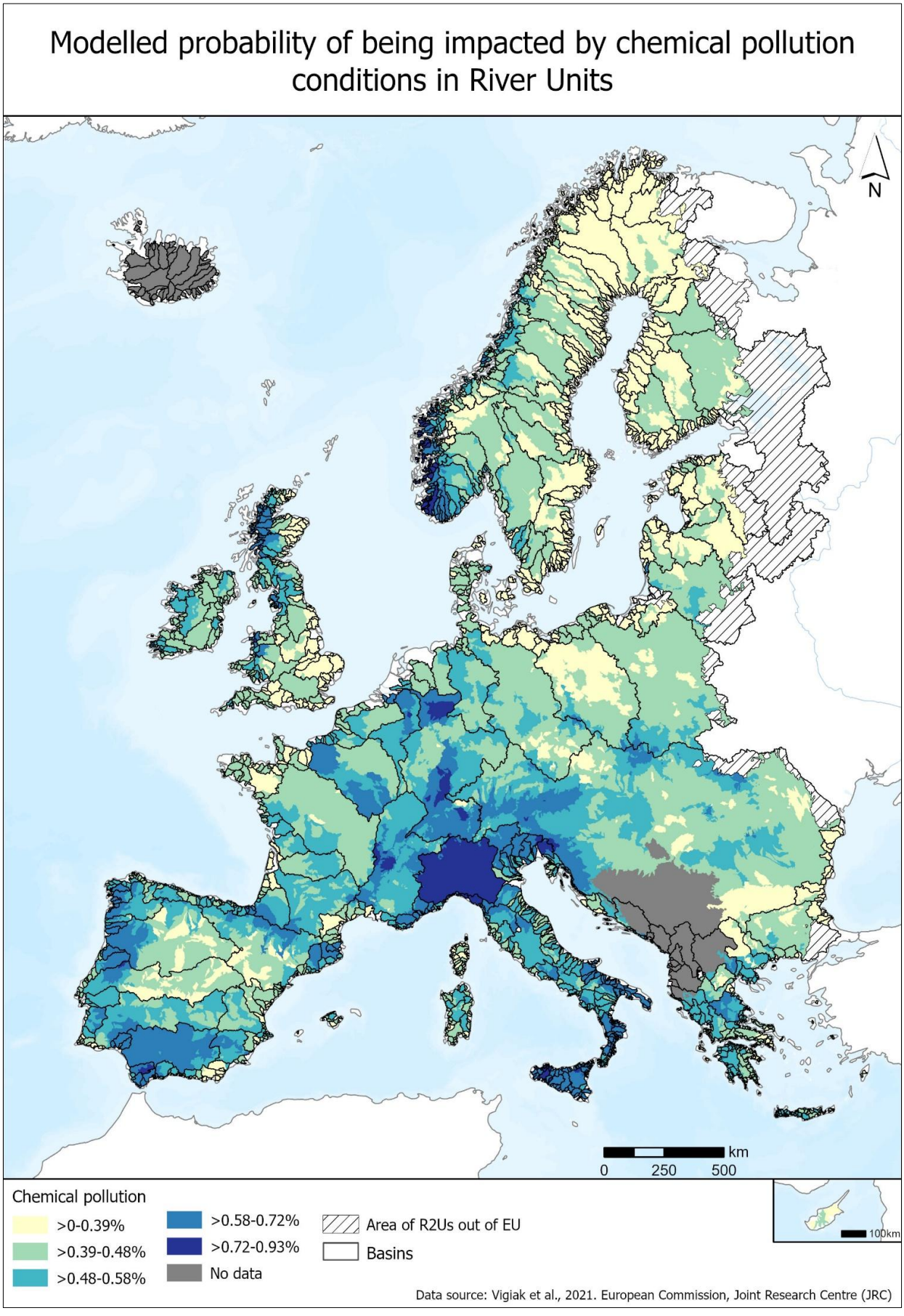
	Version: 3.0 Responsible: University of Lisbon
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the overall Species present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 17 Web Tool. 2022. Article 17 Web Tool. [online] Available at: https://www.eionet.europa.eu/etcs/etc-bd/activities/reporting/article-17> [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

Birds Directive

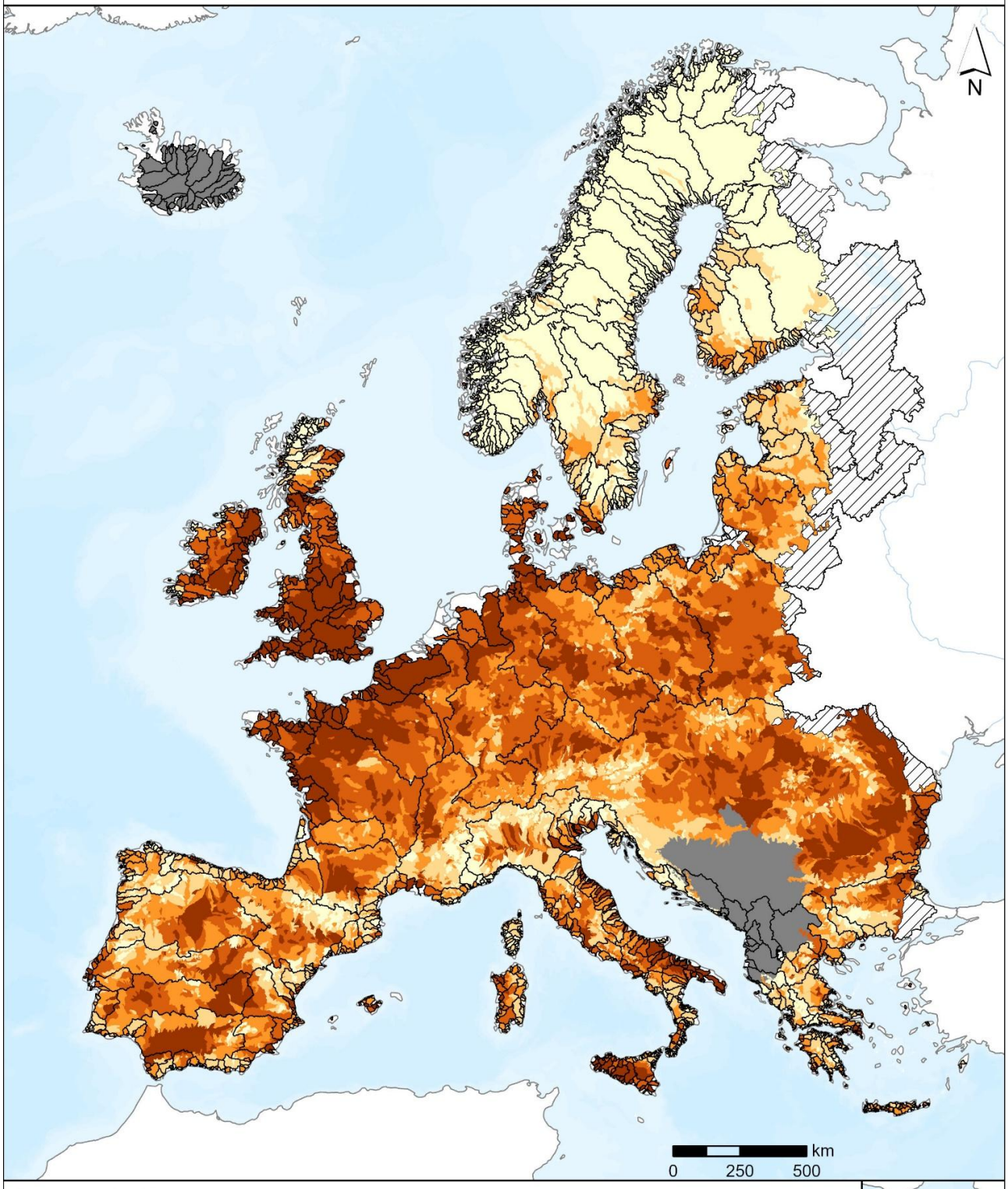
Title	Detailed composite indicator of conservation status for freshwater-related bird species in River Units
	
Summary	The detailed Composite Indicator of Conservation Status (ciCS) for the overall Bird species from article 12 of the BirdsDirective present in the River Restoration Units. Creation Date: March 2023 (date reflecting inclusion in this DB) Resolution: R2U Version: 3.0

	Responsible: University of Lisbon
Description	Value of the detailed Composite Indicator of Conservation Status (ciCS) considering the overall Species present in the R2U.
Credits	-River Restoration Units (R2U) developed under MERLIN project (unpublished) Habitats Directive data: – Article 12 Web Tool. 2022. [online] Available at: https://nature-art12.eionet.europa.eu/article12/; [Accessed 31 March 2022]. Methodology: – Carrao, Hugo, Stefan Kleeschulte, Marco Trombetti, Dania Abdul Malak, Fernando Santos Martín, Adrián García Bruzón, Aurélien Carré, and Sophie Condé. Task 1.7.5.3: Green Infrastructure (Gi). Key Deliverable Kd2 – Green Infrastructure Analysis: Contribution to Wetlands. Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020. – Carrao, Hugo, Stefan Kleeschulte, Sandra Naumann, McKenna Davis, Christoph Schröder, Dania Abdul Malak, and Sophie Conde. Contributions to Building a Coherent Trans-European Nature Network. What Is the Contribution of Gi to Improving the Conservation Status of Species of Community Interest and the Delivery of Ecosystem Services in Europe? Strengthening the Gi Network with a View to Enhance Its Multiple Benefits. . Vienna, Austria: European Topic Centre on Urban, Land and Soil Systems, 2020.
Limitation	No limitation

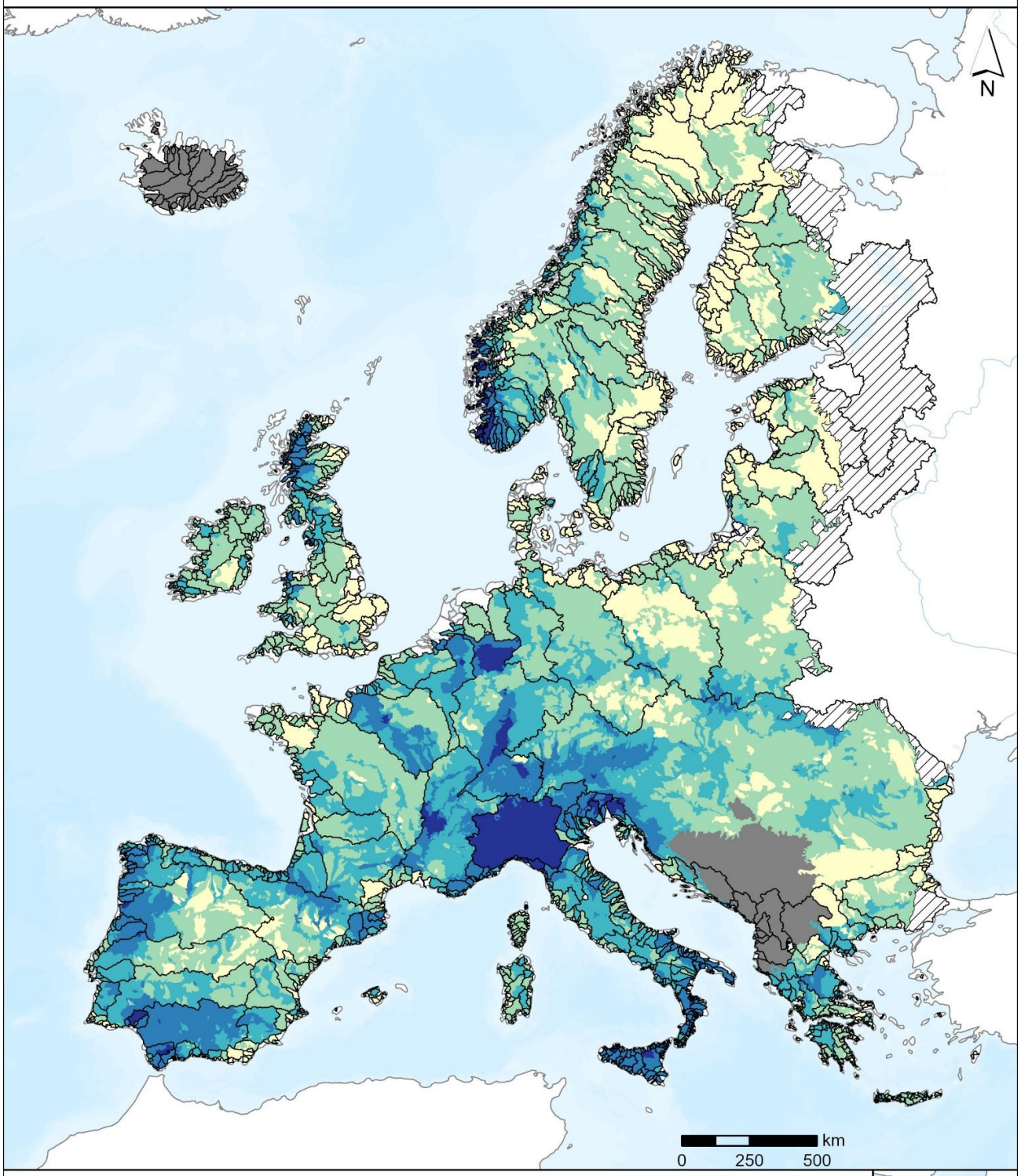
Water Framework Directive



Modelled probability of failing Good Ecological Status in River Units

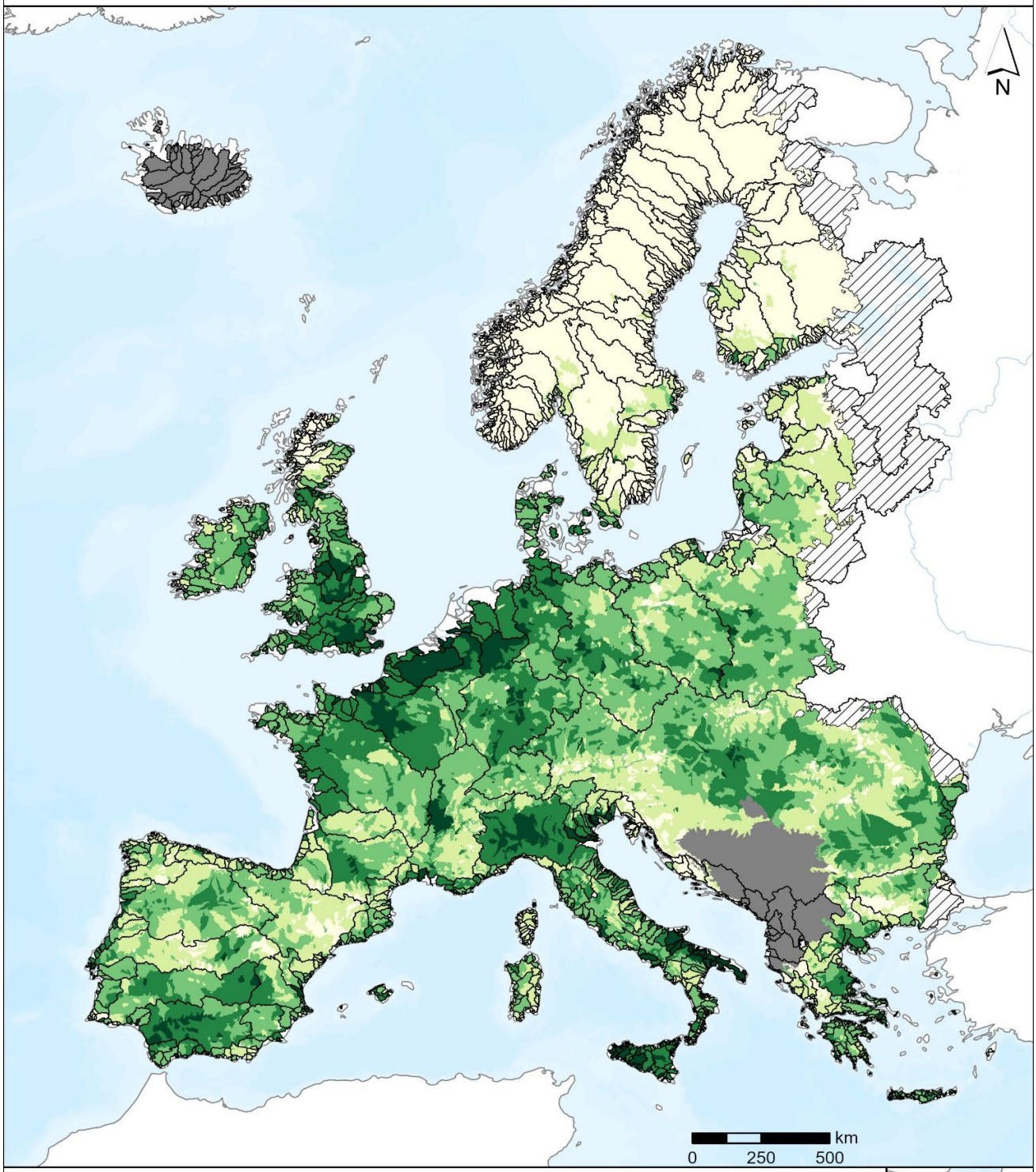


Modelled probability of being impacted by altered hydrological conditions in River Units



Data source: Vigiak et al., 2021. European Commission, Joint Research Centre (JRC)

Modelled probability of being impacted by altered morphological conditions in River Units

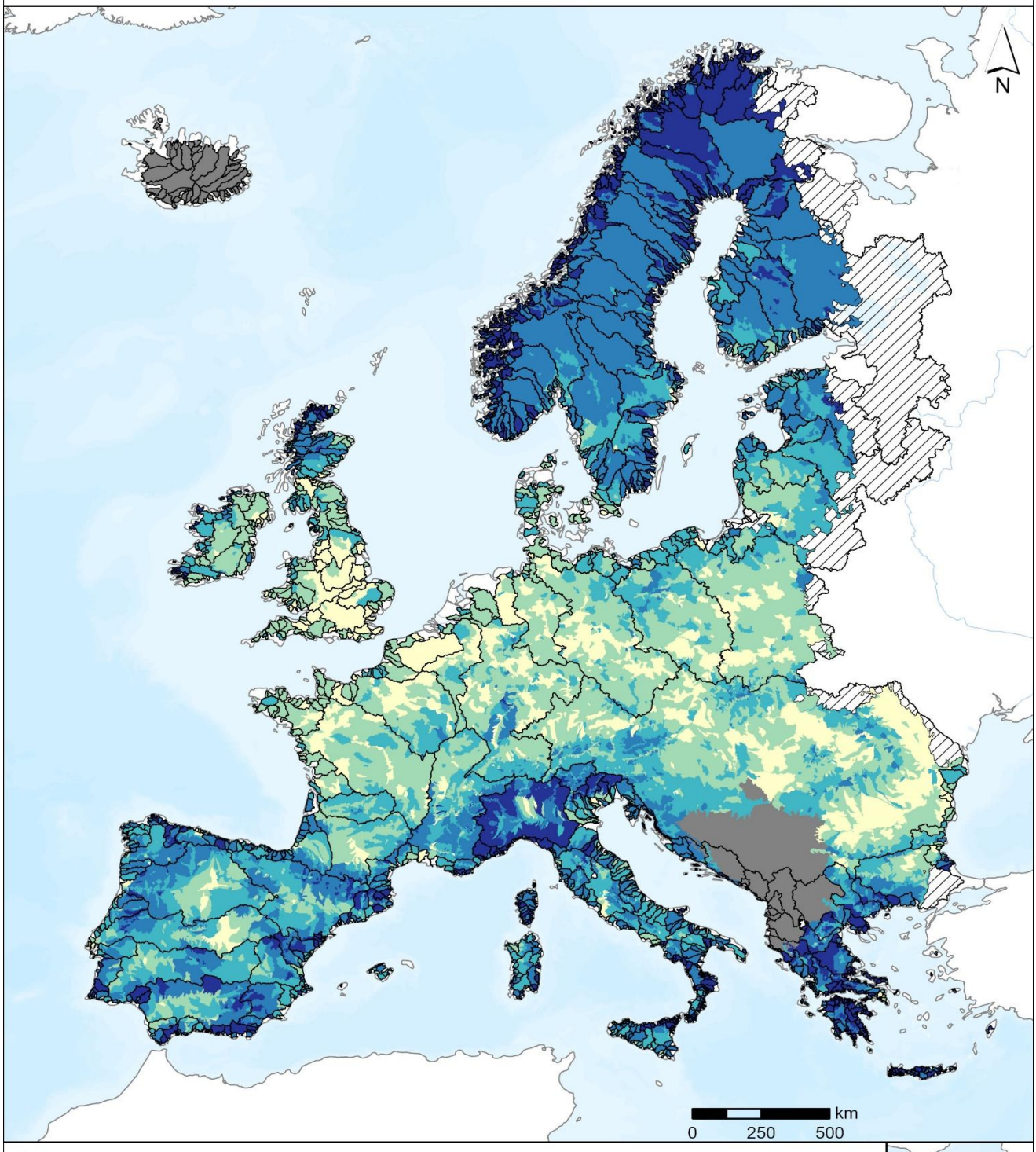


Altered morphology

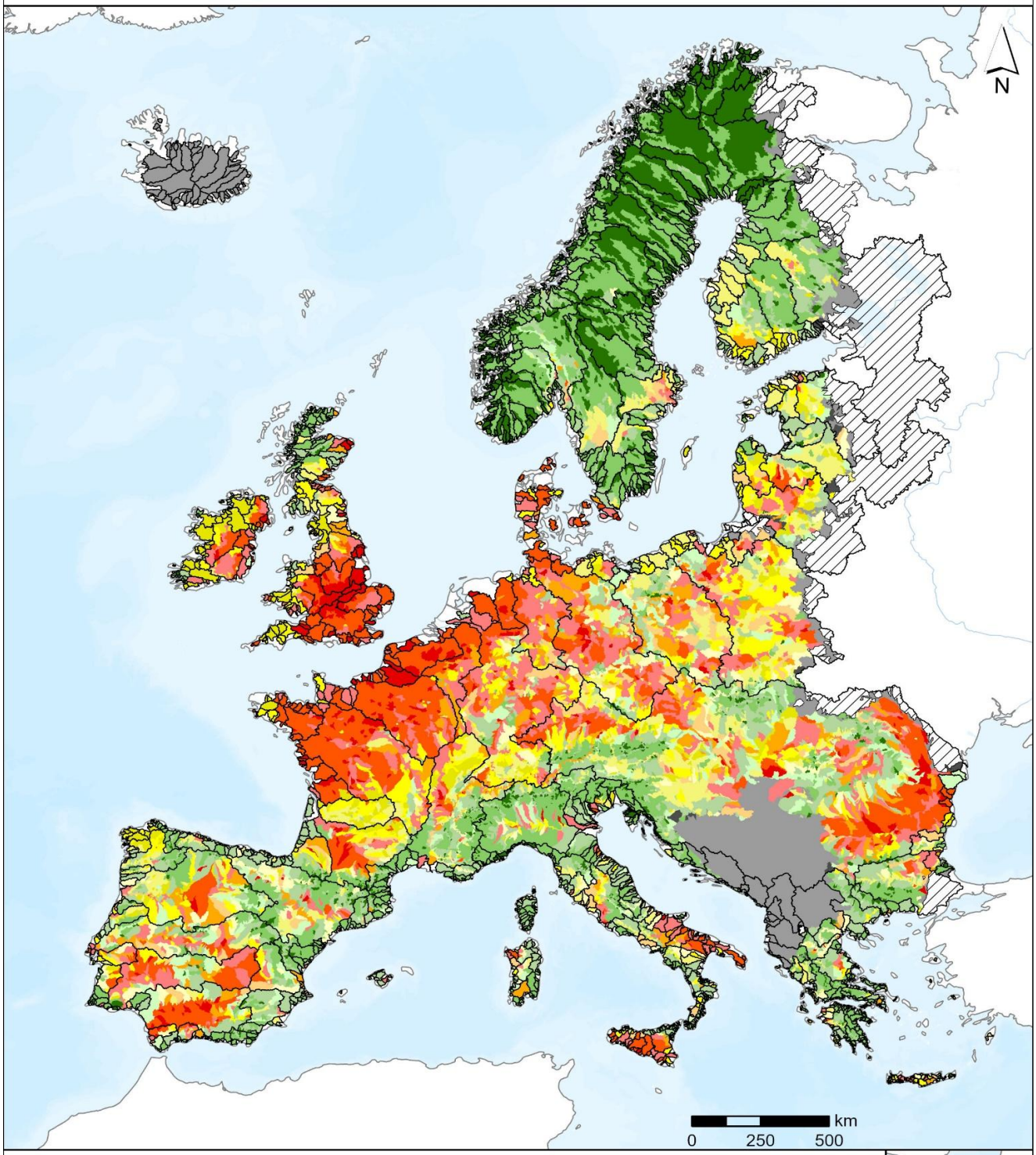
- >0-0.42%
- >0.42-0.47%
- >0.47-0.53%
- >0.53-0.61%
- >0.61-0.89%
- No data
- Area of R2Us out of EU
- Basins

Data source: Vigiak et al., 2021. European Commission, Joint Research Centre (JRC)

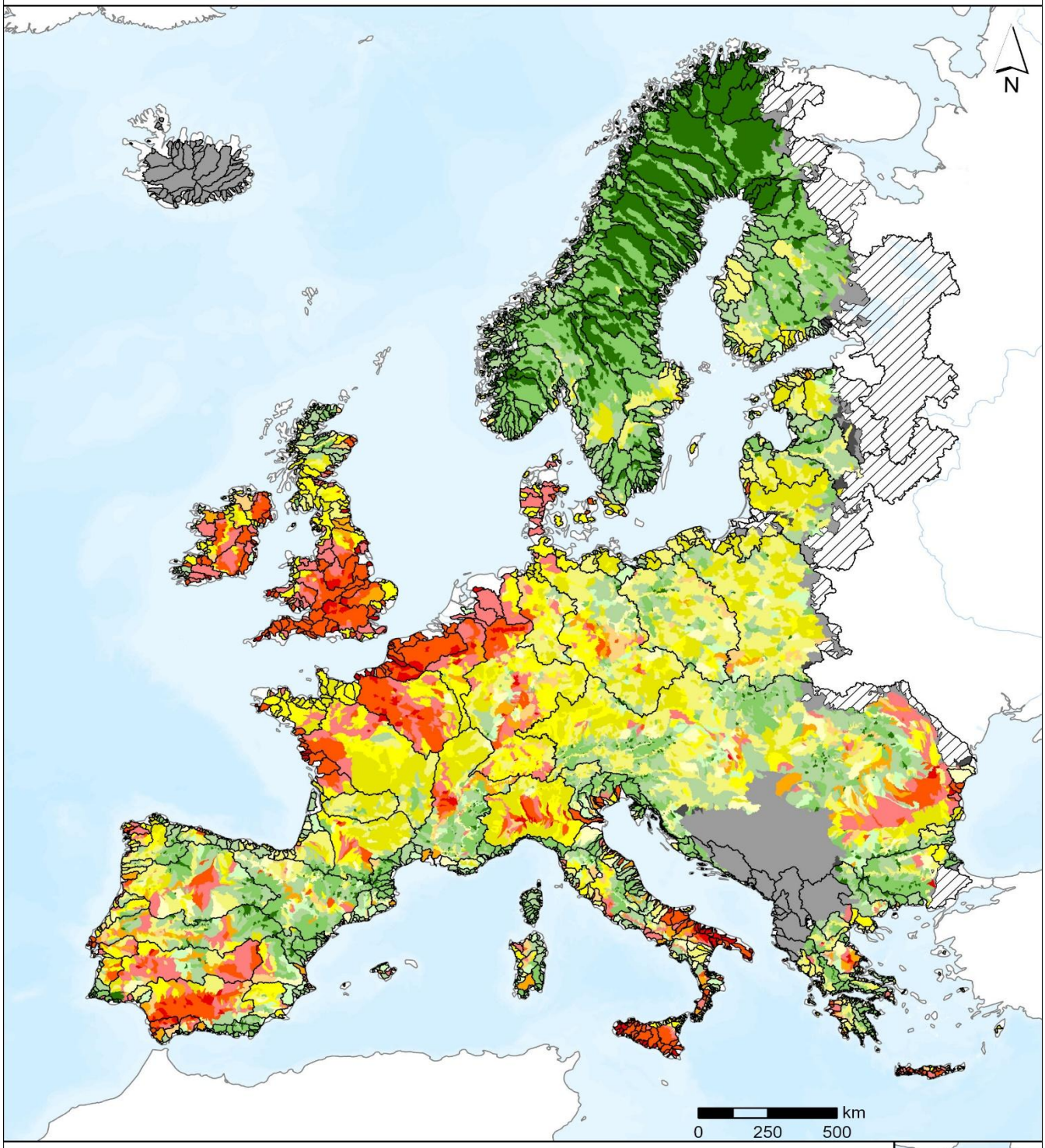
Modelled probability of no impact in River Units



Detailed composite indicator of conservation status of Water Frame Directive nutrient pollution prediction

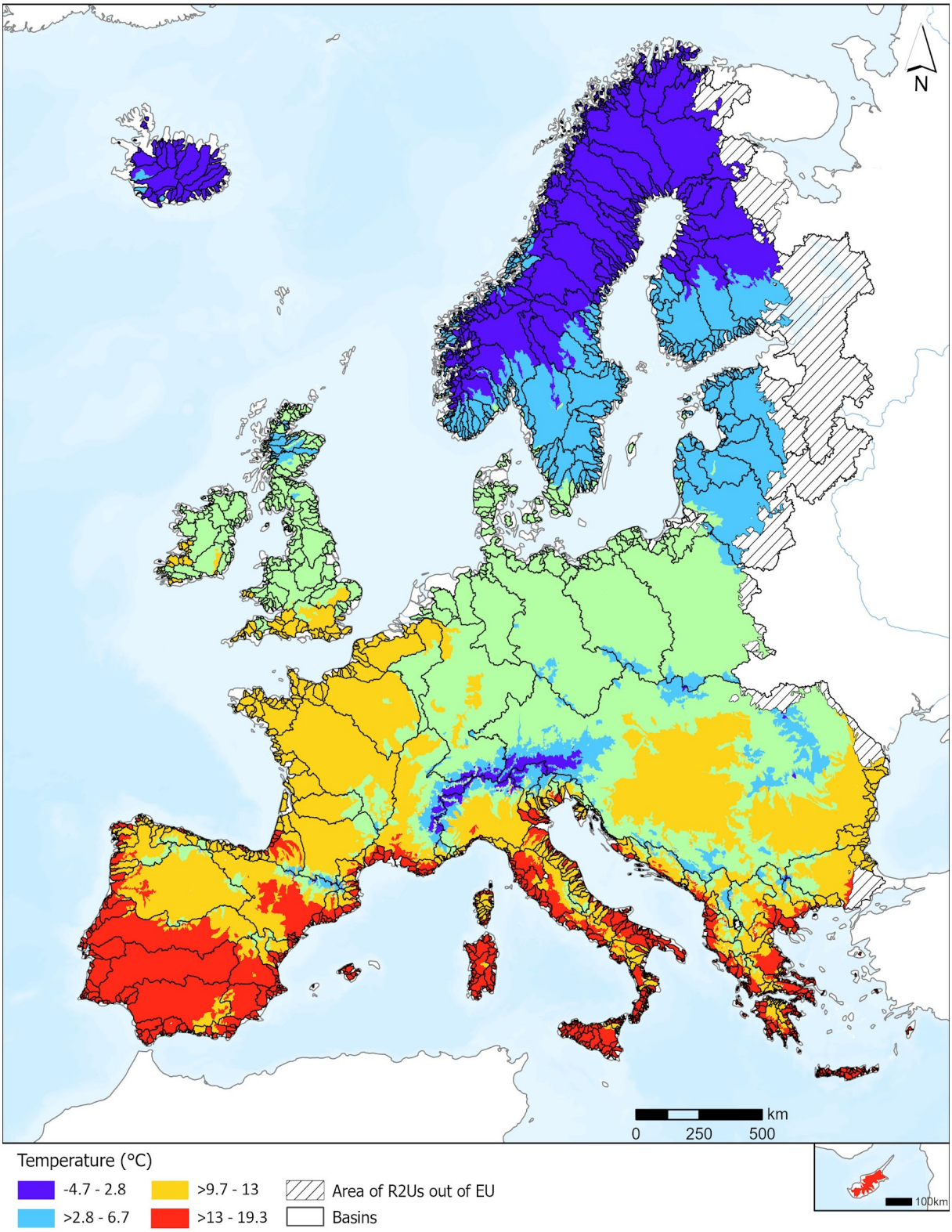


Detailed composite indicator of conservation status of Water Frame Directive organic pollution prediction



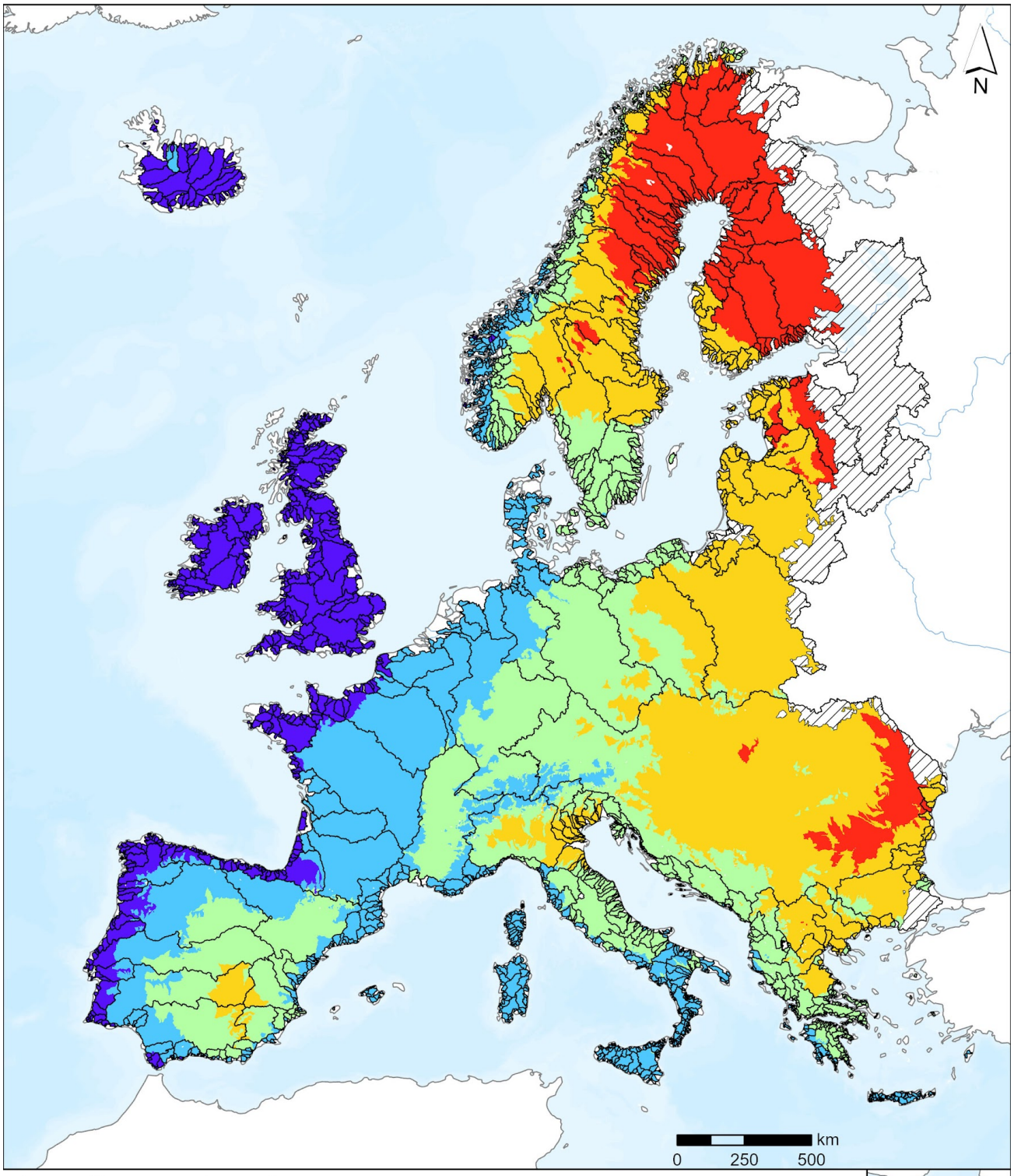
Climatic Change Projections

Mean Annual Air Temperature for the period 1970-2000, in River Units



Data source: WorldClim v 2.1

Temperature seasonality for the period 1970-2000, in River Units

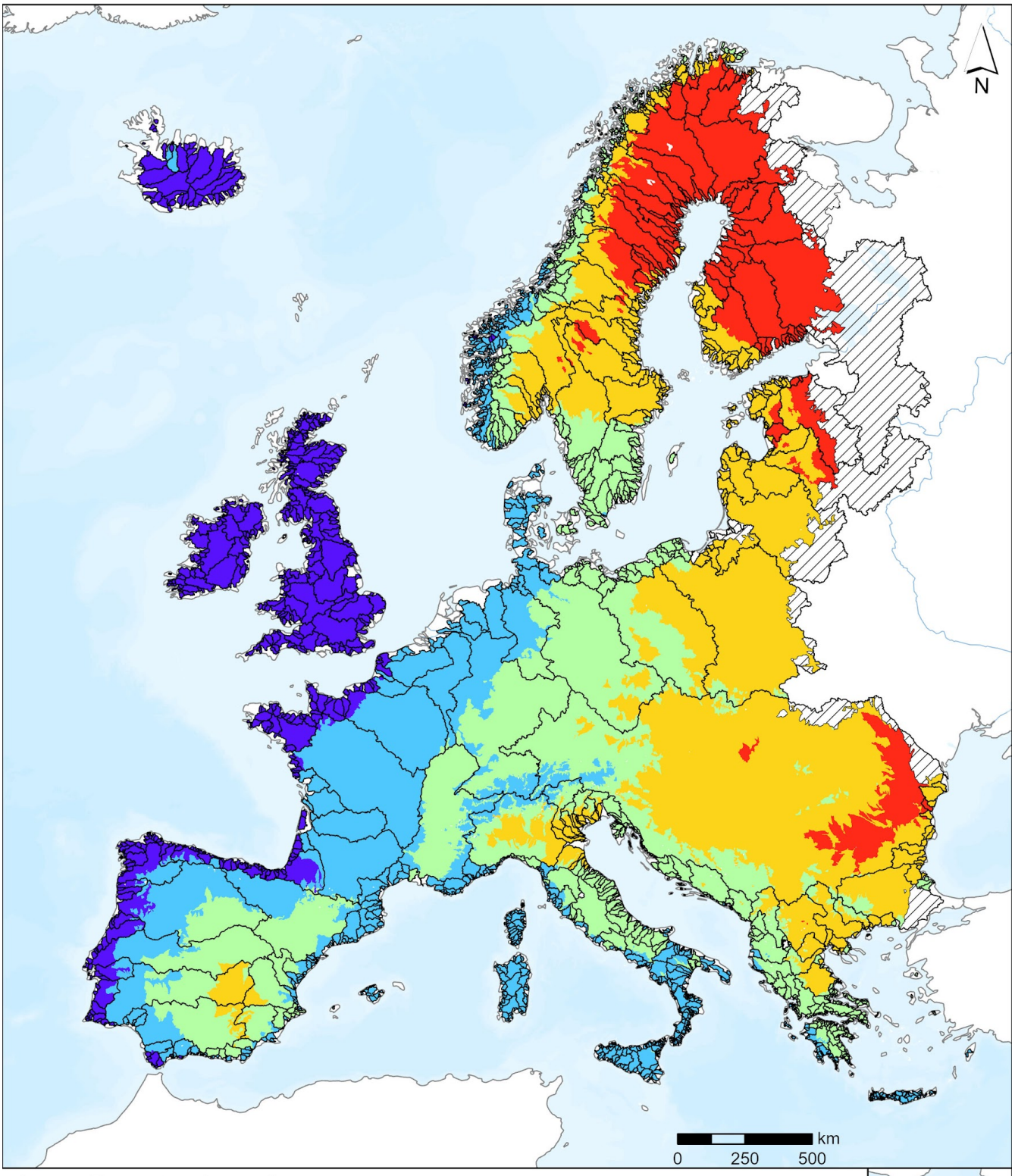


Average Temperature Seasonality

316 - 504
>504 - 625
>625 - 720
>720- 851
>851- 1041
Area of R2Us out of EU
Basins

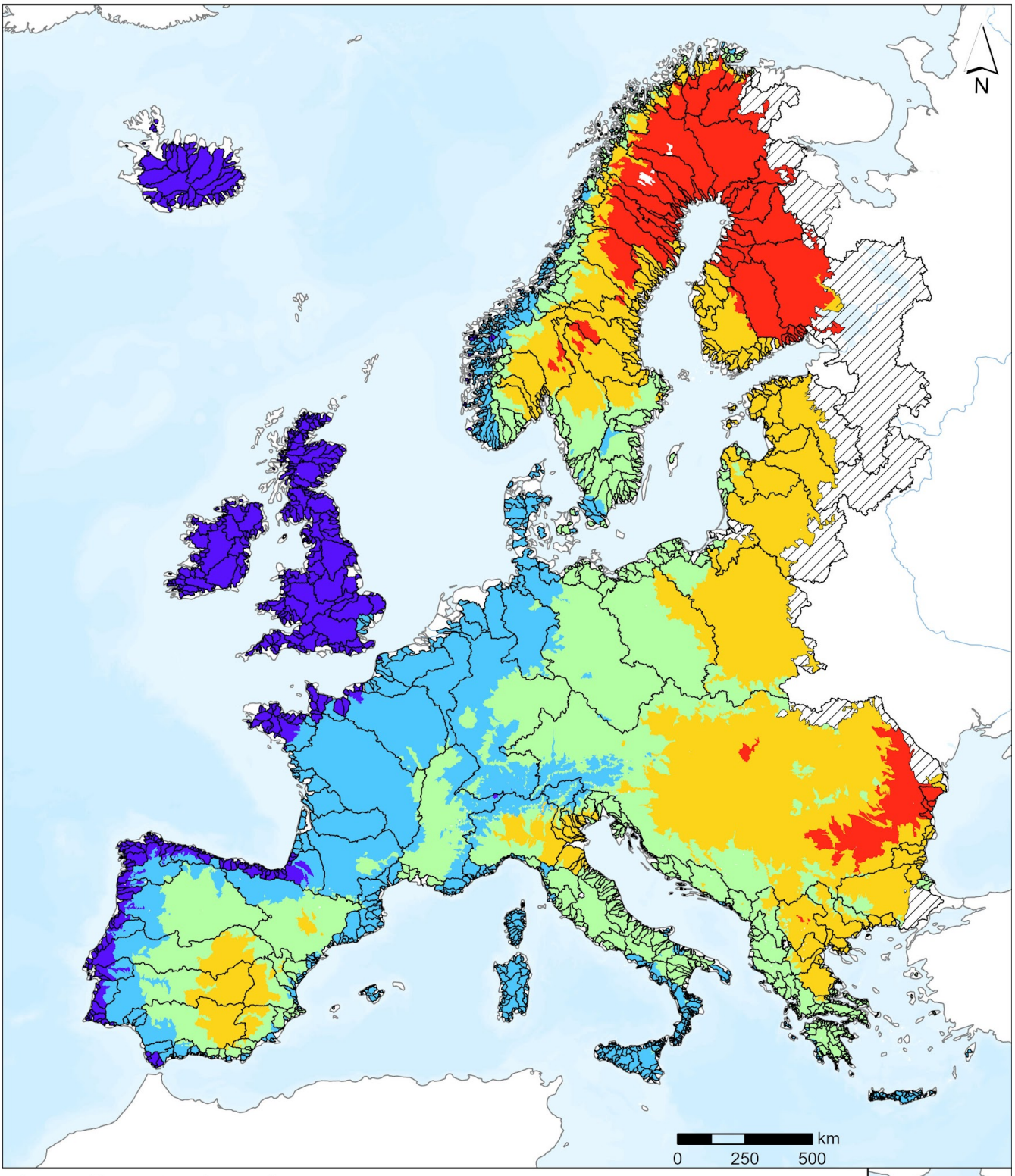
Data source: WorldClim v 2.1

Temperature seasonality for the period 2021-2040 under ssp370 scenario, in River Units



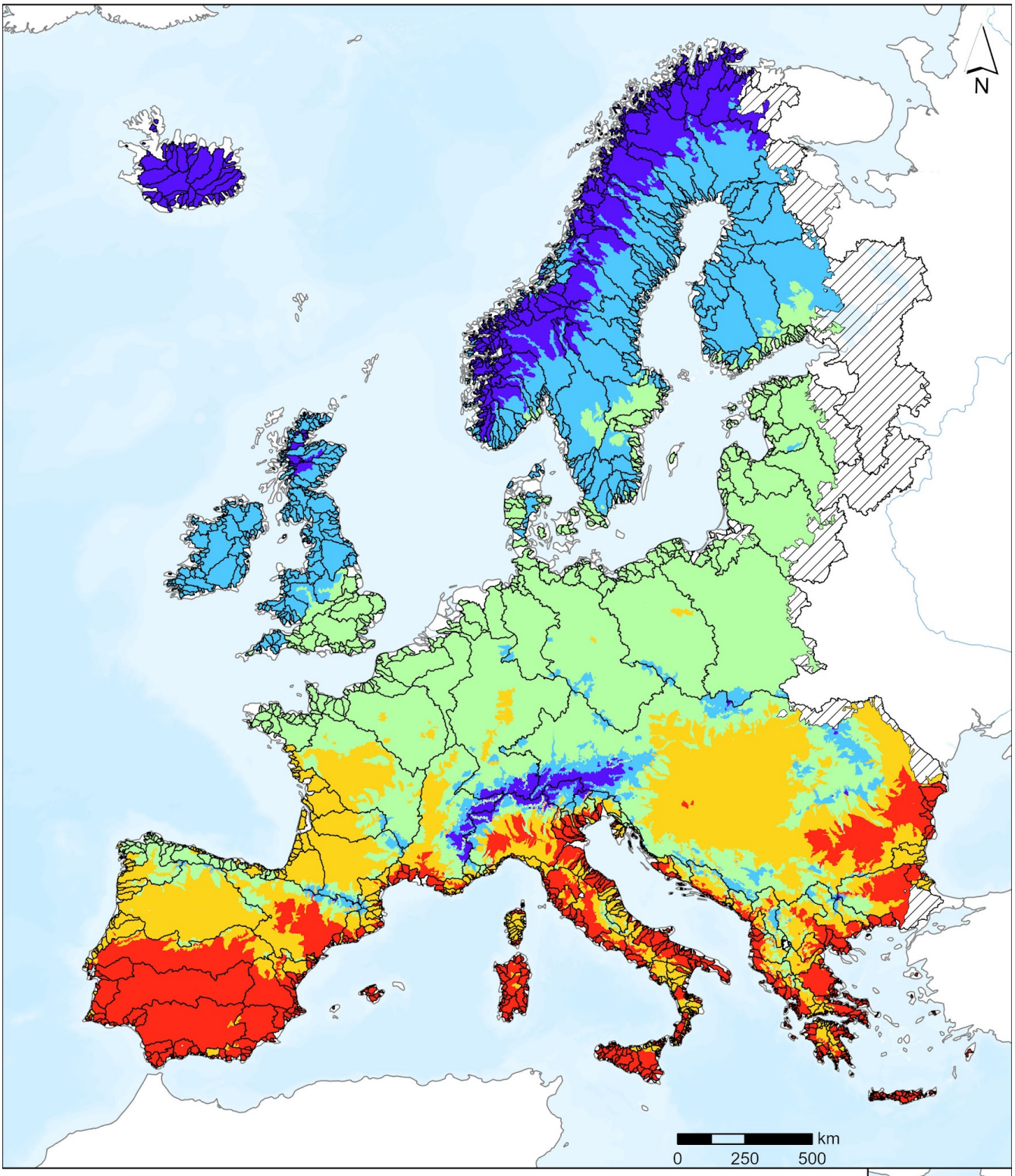
Data source: WorldClim v 2.1

Temperature seasonality for the period 2021-2040 under ssp585 scenario, in River Units



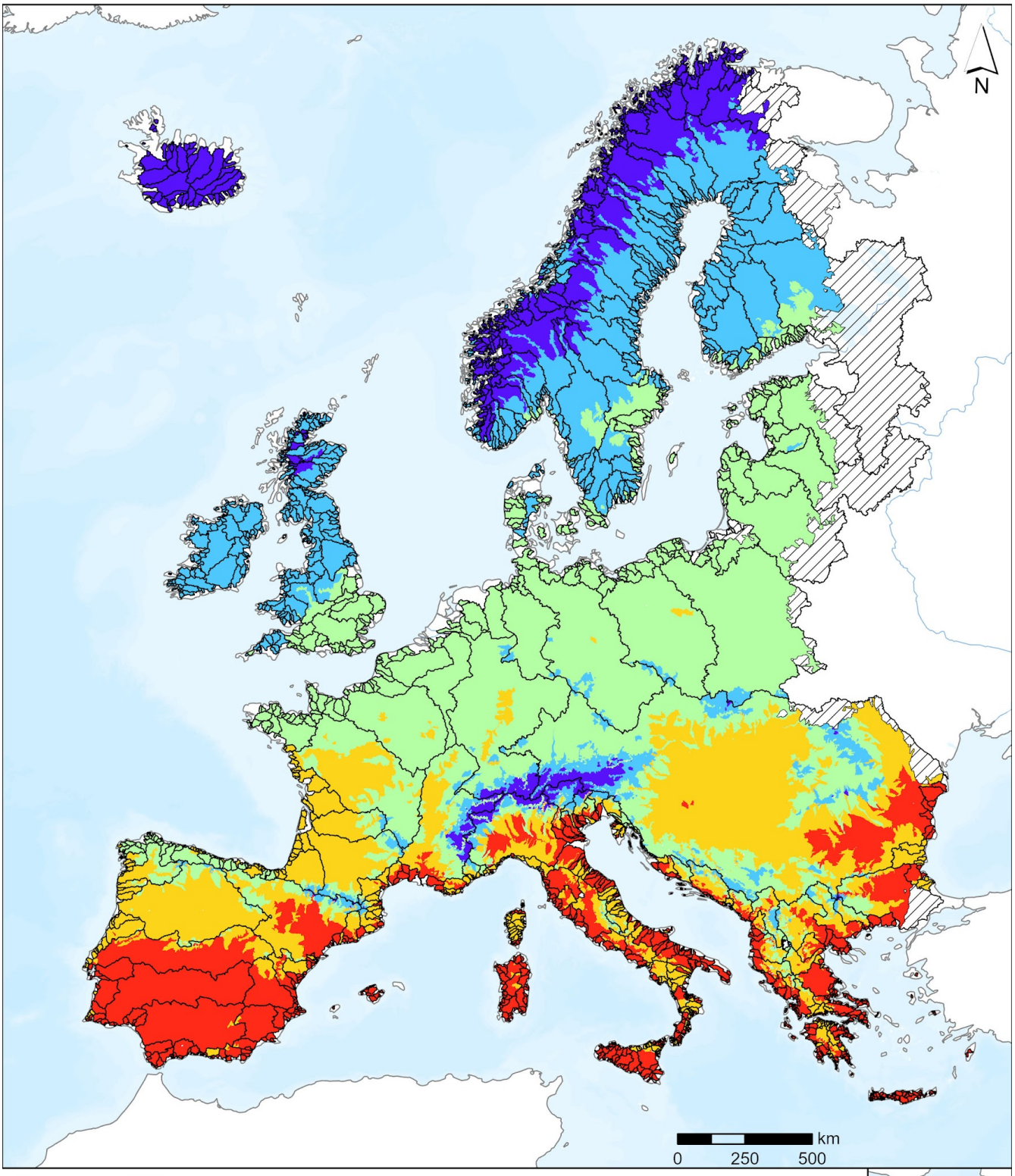
Data source: WorldClim v 2.1

Mean Daily Mean Air Temperatures of the warmest quarter for the period 1970-2000, in River Units



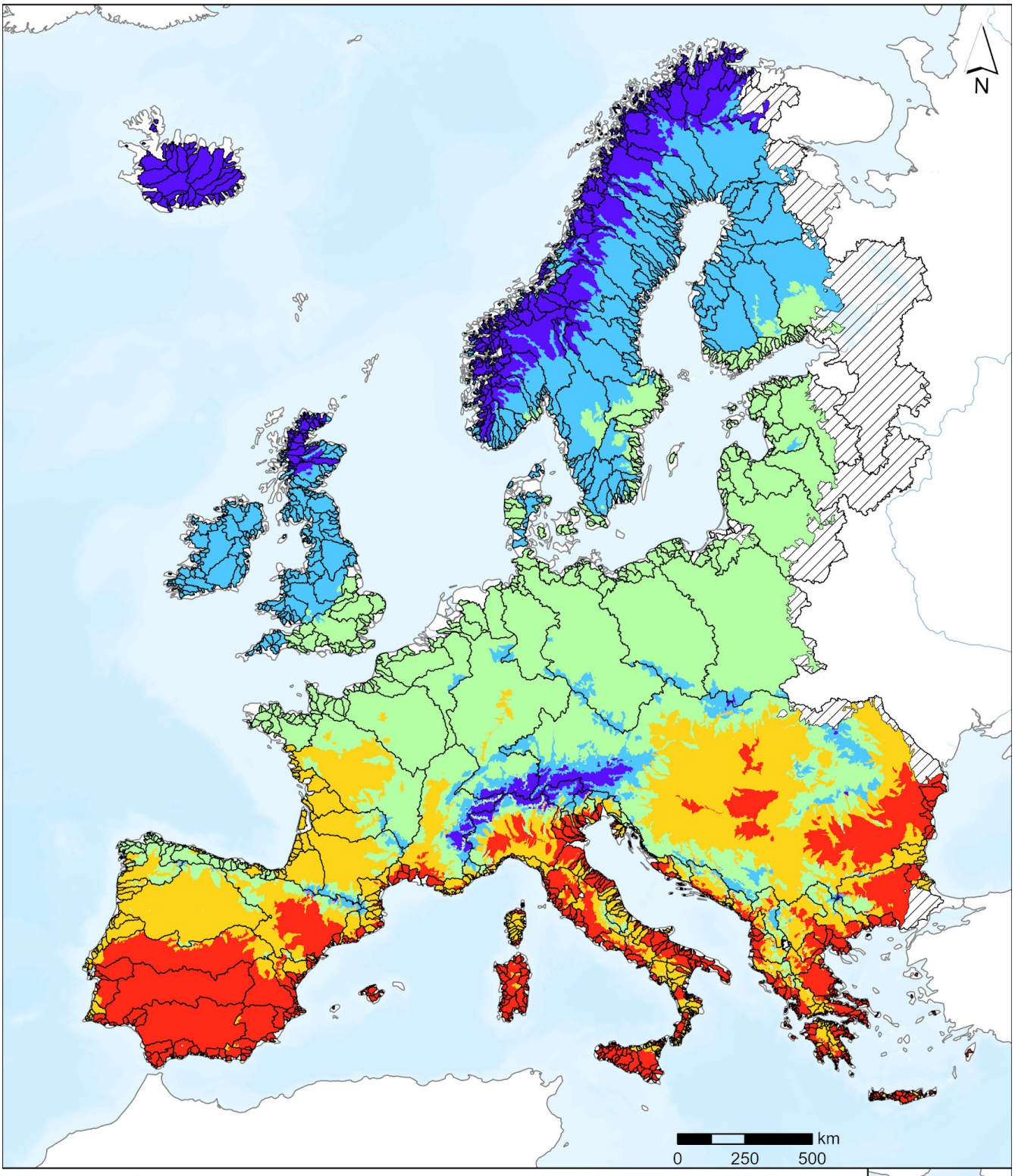
Data source: WorldClim v 2.1

Mean Daily Mean Air Temperatures of the warmest quarter for the period 2021-2040 under ssp370 scenario, in River Units



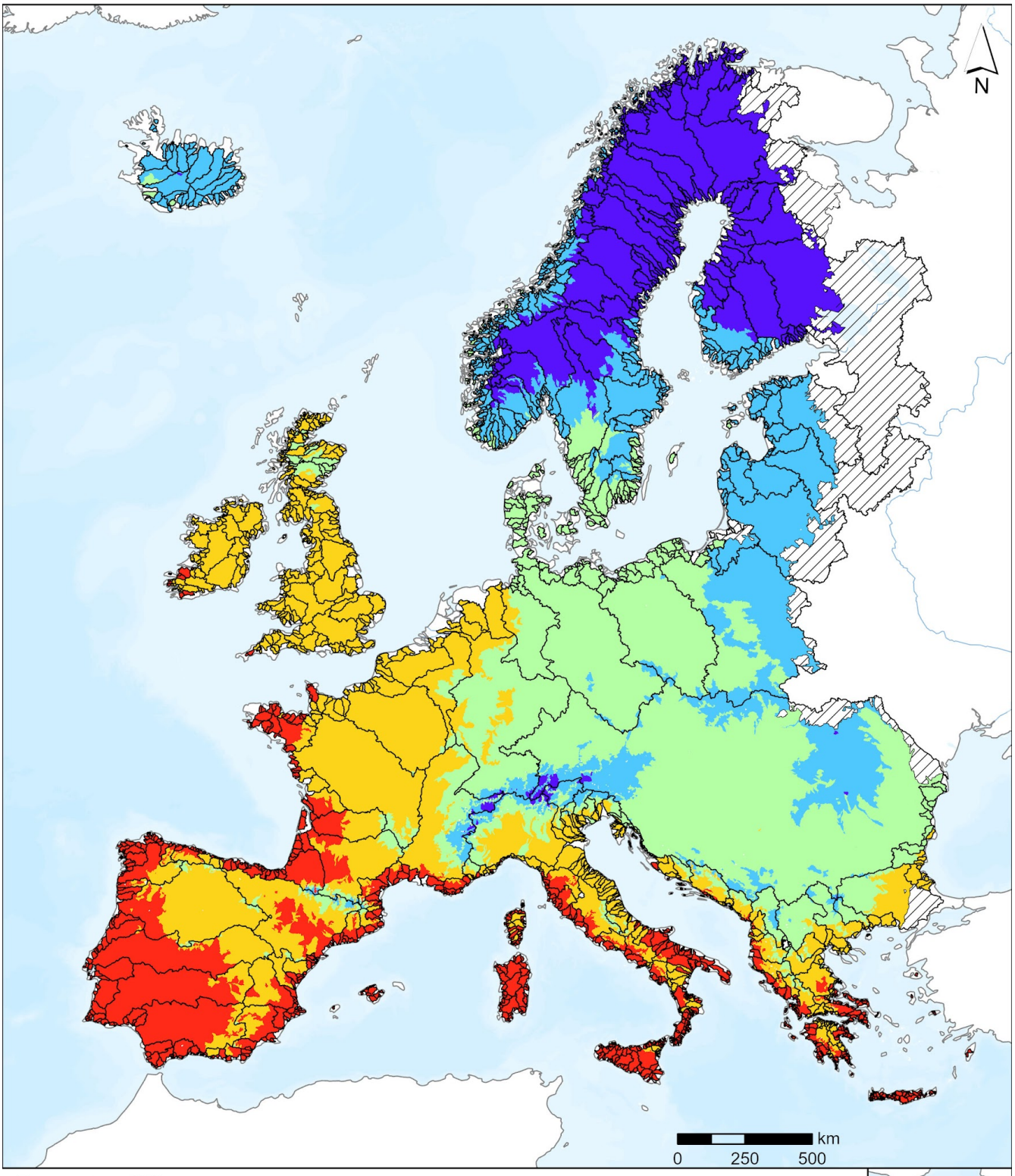
Data source: WorldClim v 2.1

Mean Daily Mean Air Temperatures of the warmest quarter for the period 2021-2040 under ssp585 scenario, in River Units



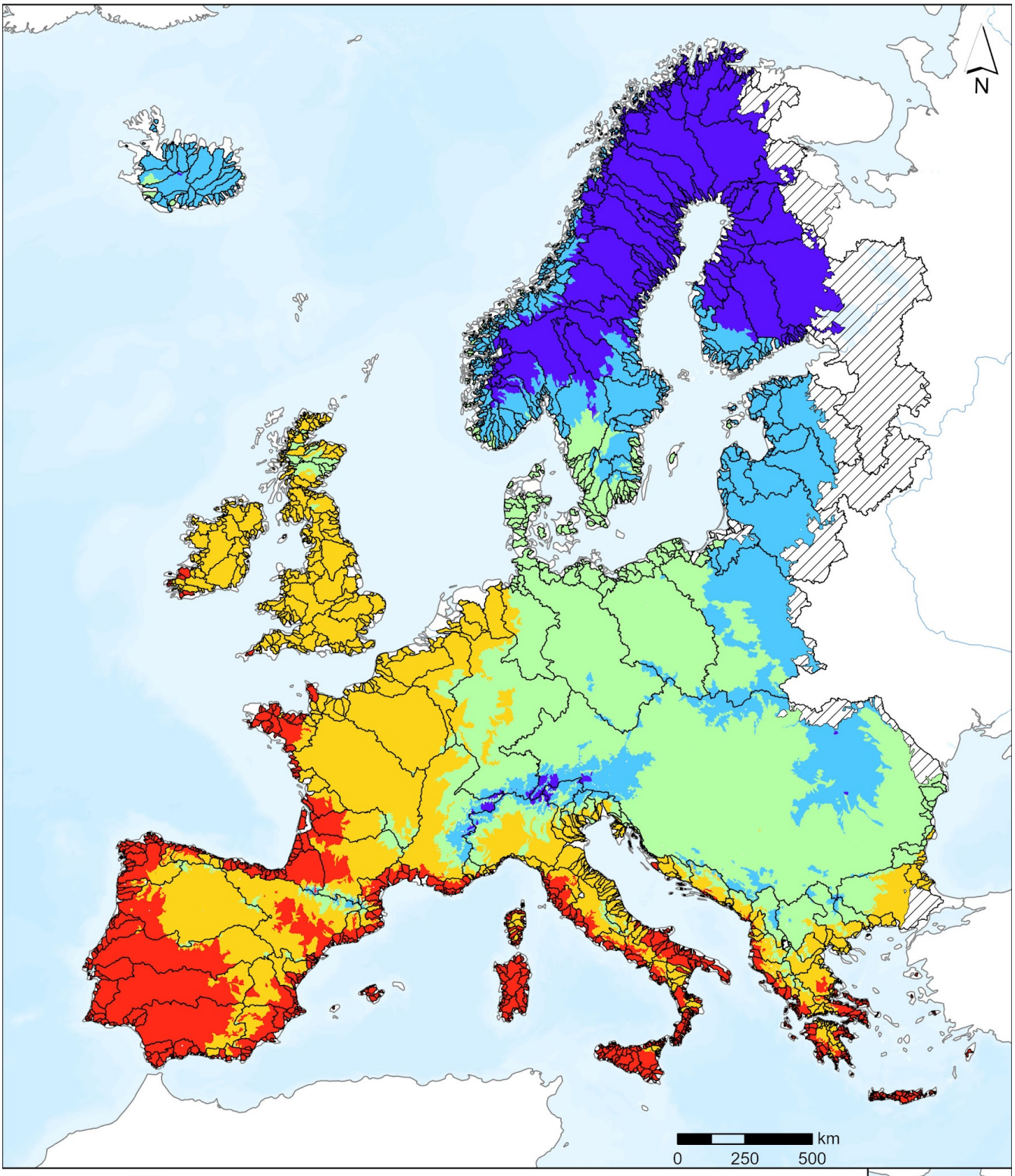
Data source: WorldClim v 2.1

Mean Daily Mean Air Temperature of the coldest quarter for the period 1970-2000, in River Units



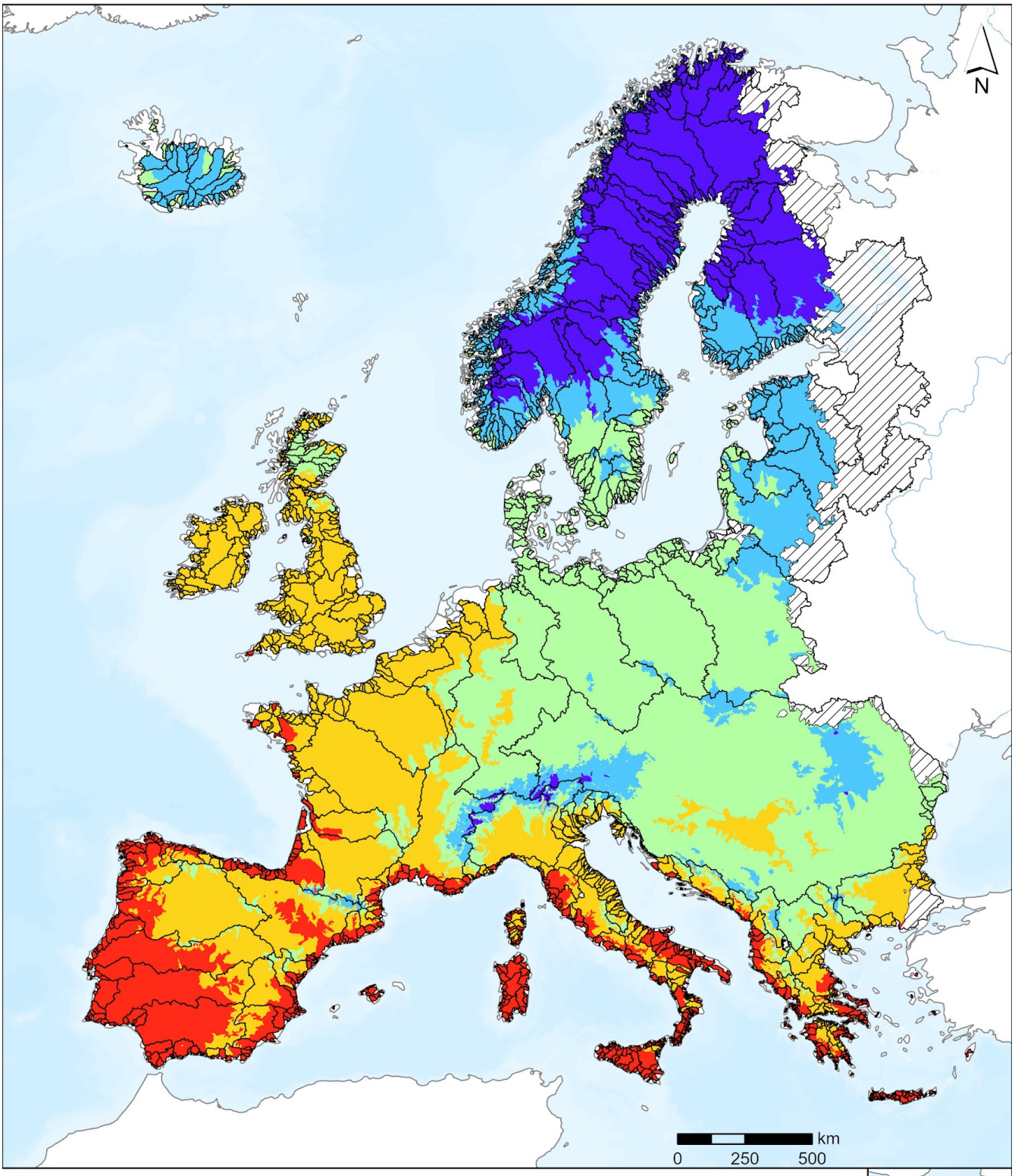
Data source: WorldClim v 2.1

Mean Daily Mean Air Temperature of the coldest quarter for the period 2021-2040 under ssp370 scenario, in River Units



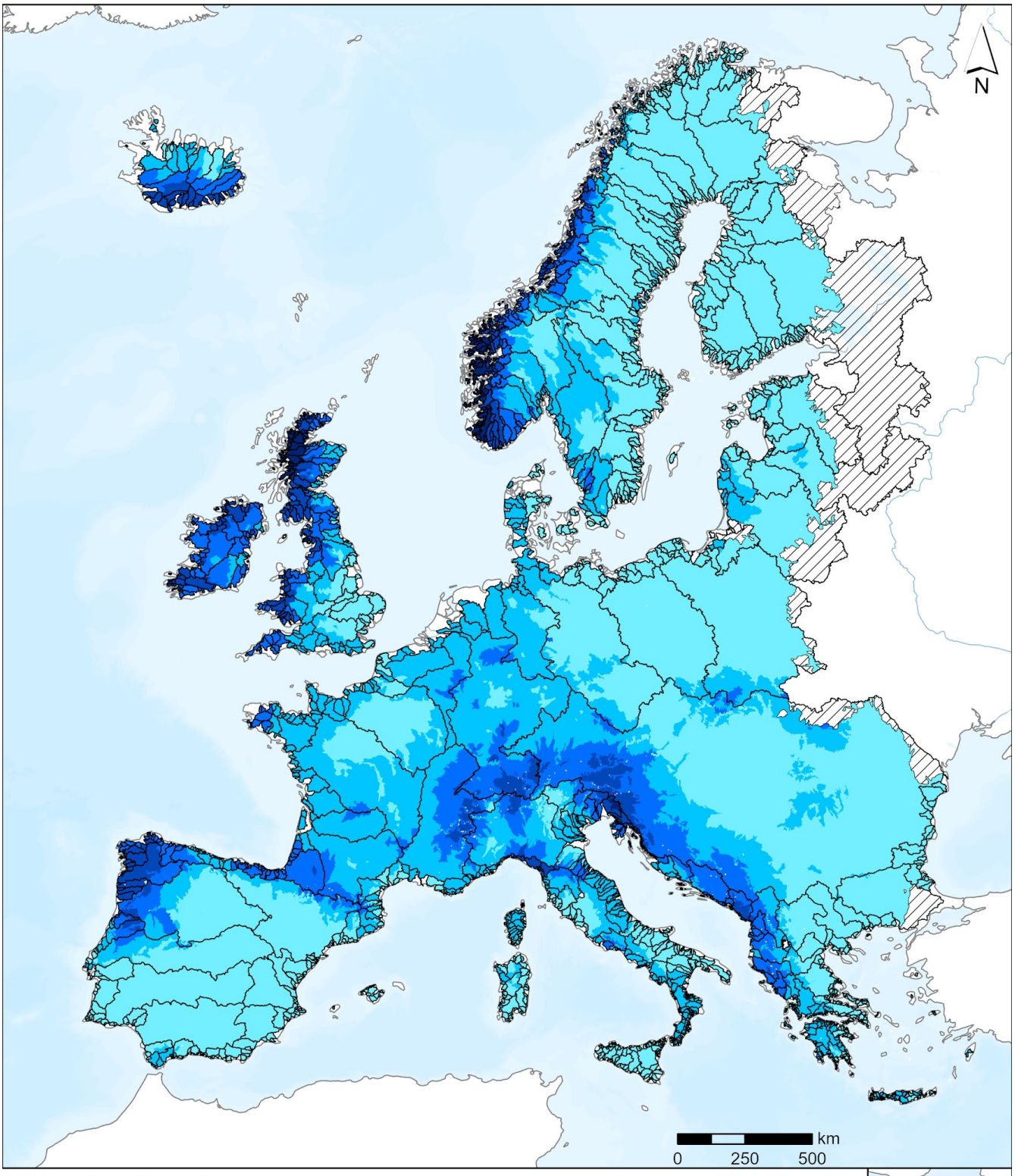
Data source: WorldClim v 2.1

Mean Daily Mean Air Temperature of the coldest quarter for the period 2021-2040 under ssp585 scenario, in River Units



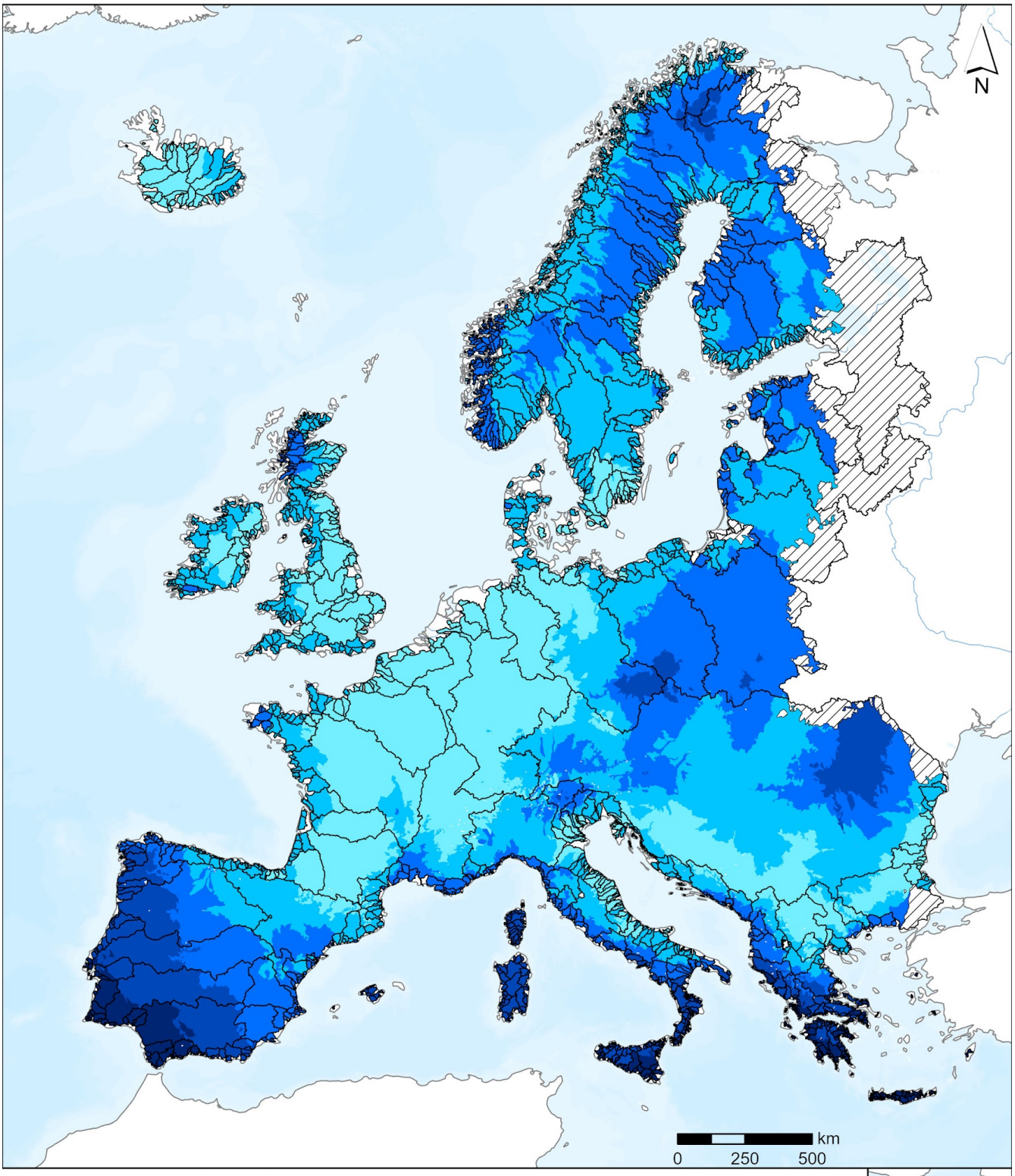
Data source: WorldClim v 2.1

Annual Precipitation amount for the period 1970-2000, in River Units



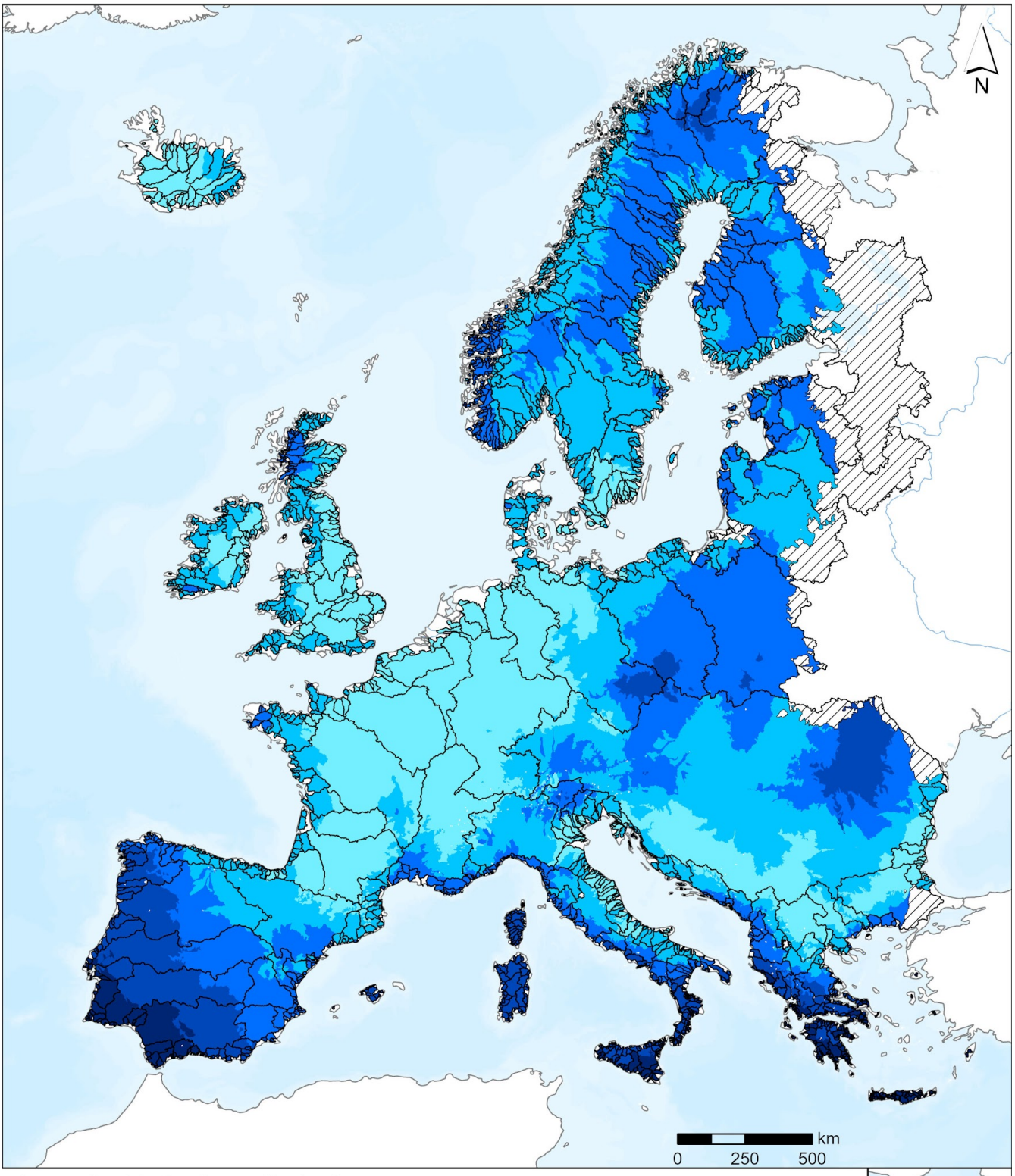
Data source: WorldClim v 2.1

Precipitation Seasonality for the period 1970-2000, in River Units



Data source: WorldClim v 2.1

Precipitation seasonality for the period 2021-2040 under ssp370 scenario, in River Units



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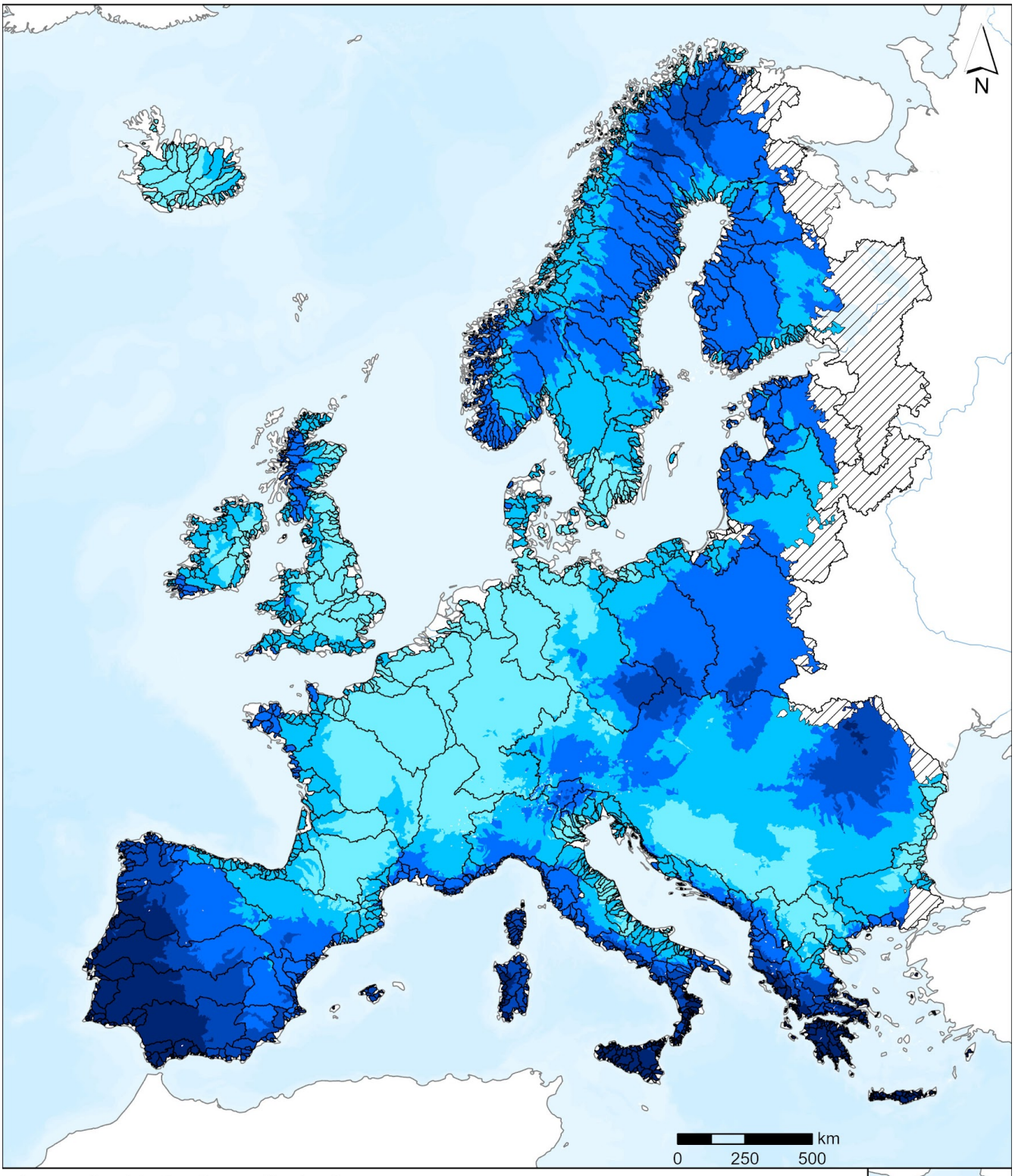
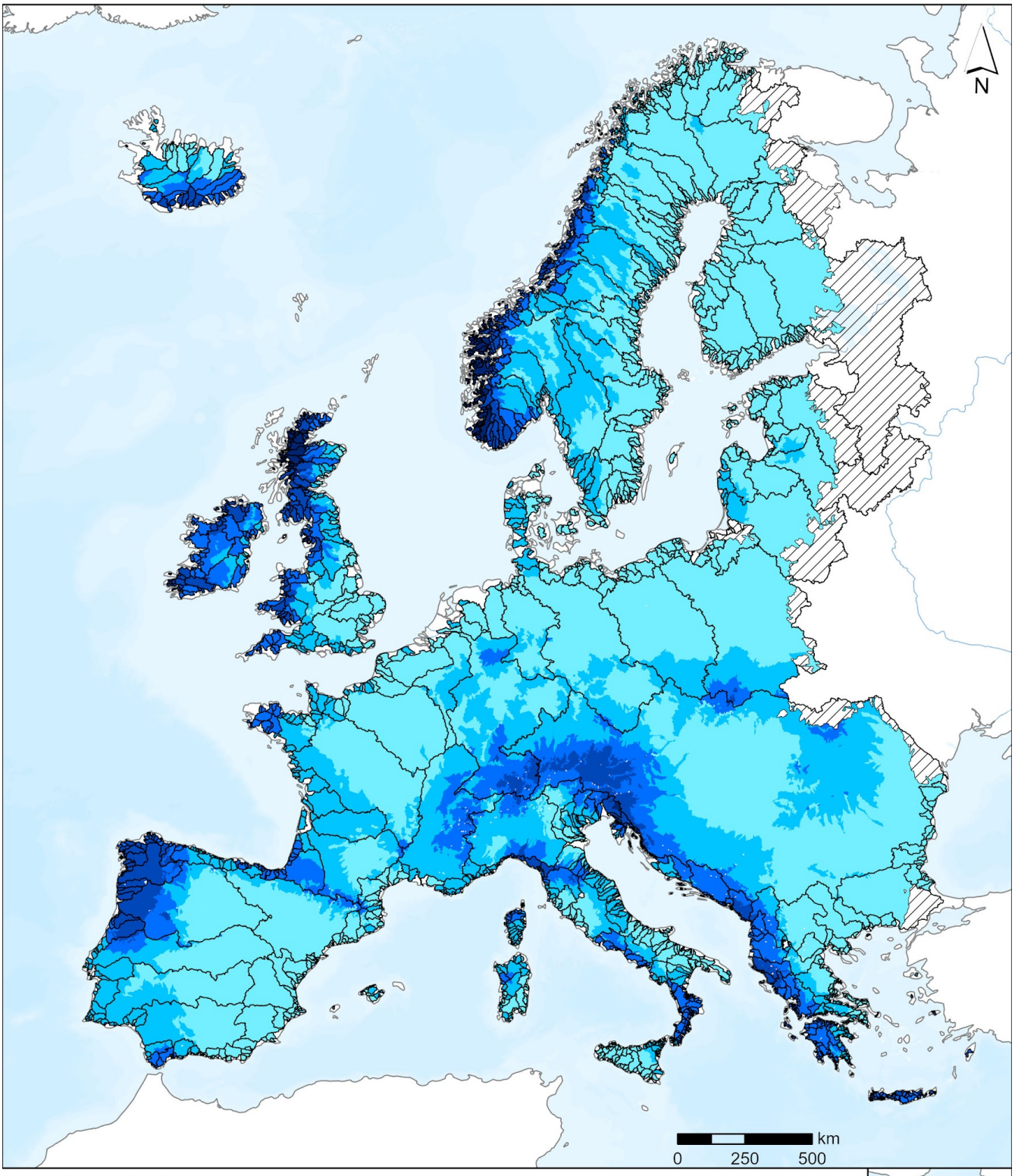
Precipitation seasonality for the period 2021-2040 under ssp585 scenario, in River Units



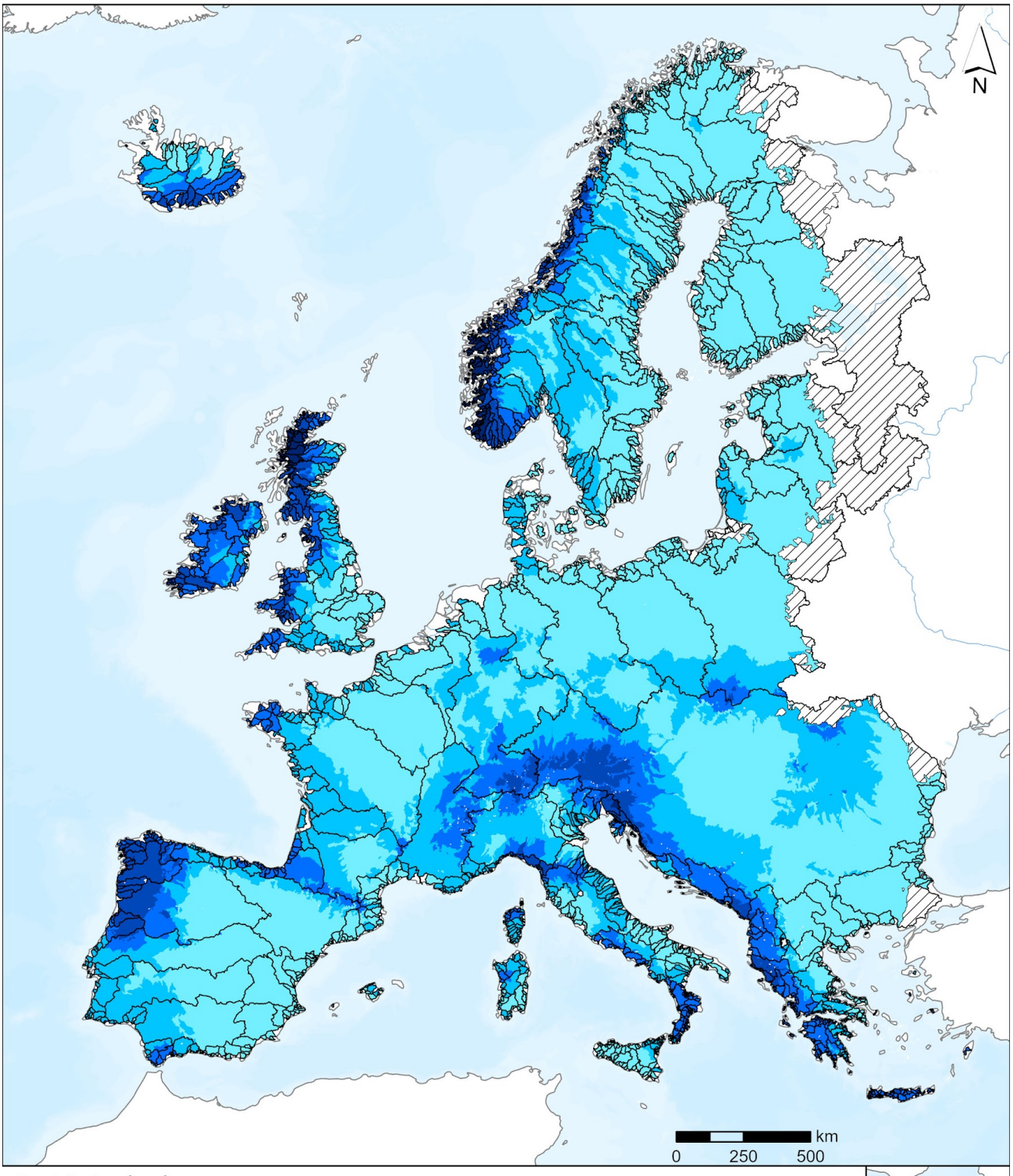
Data source: WorldClim v 2.1

Mean monthly precipitation of the wettest quarter for the period 1970-2000, in River Units



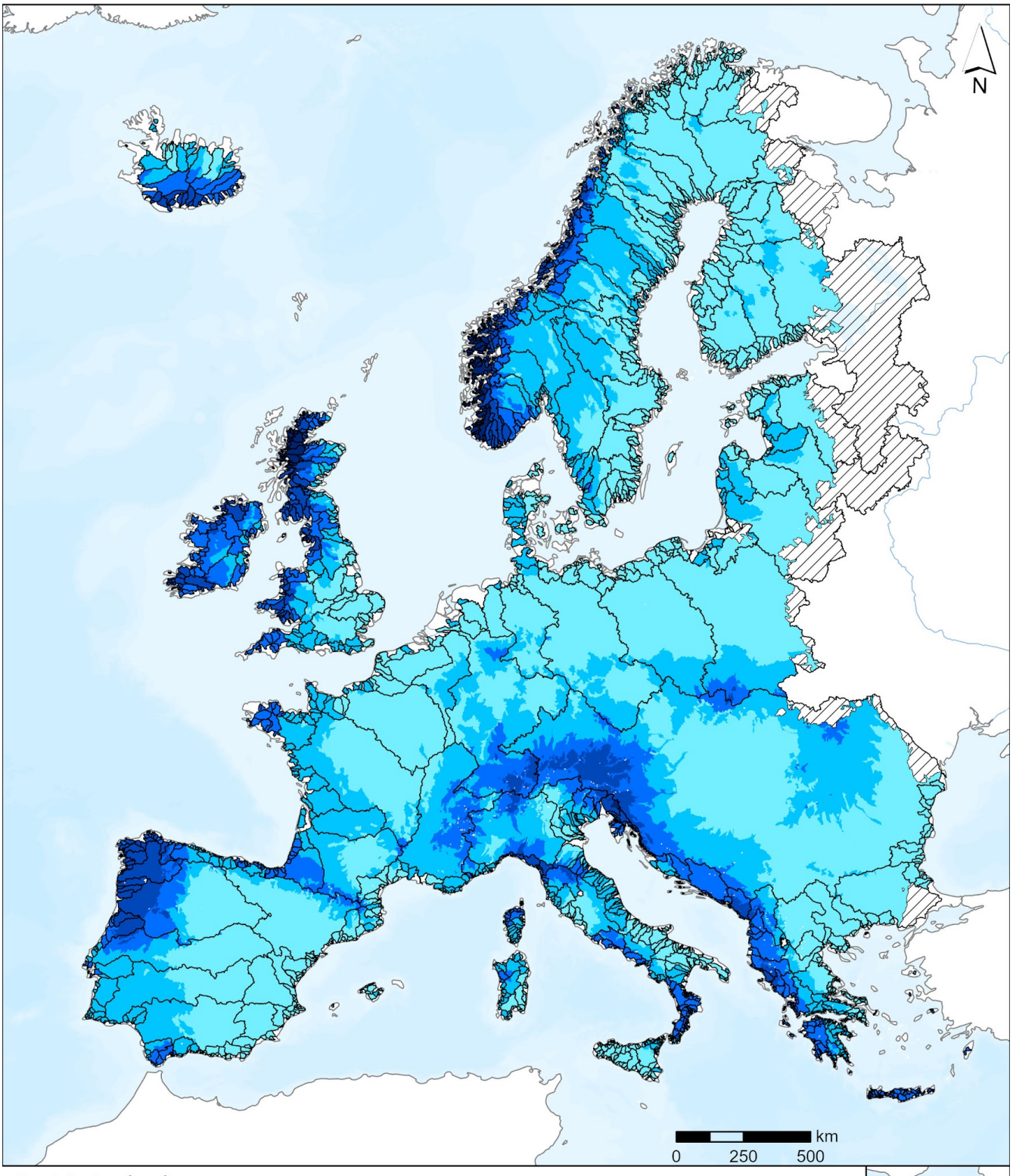
Data source: WorldClim v 2.1

Mean monthly precipitation of the wettest quarter for the period 2021-2040 under ssp370 scenario, in River Units



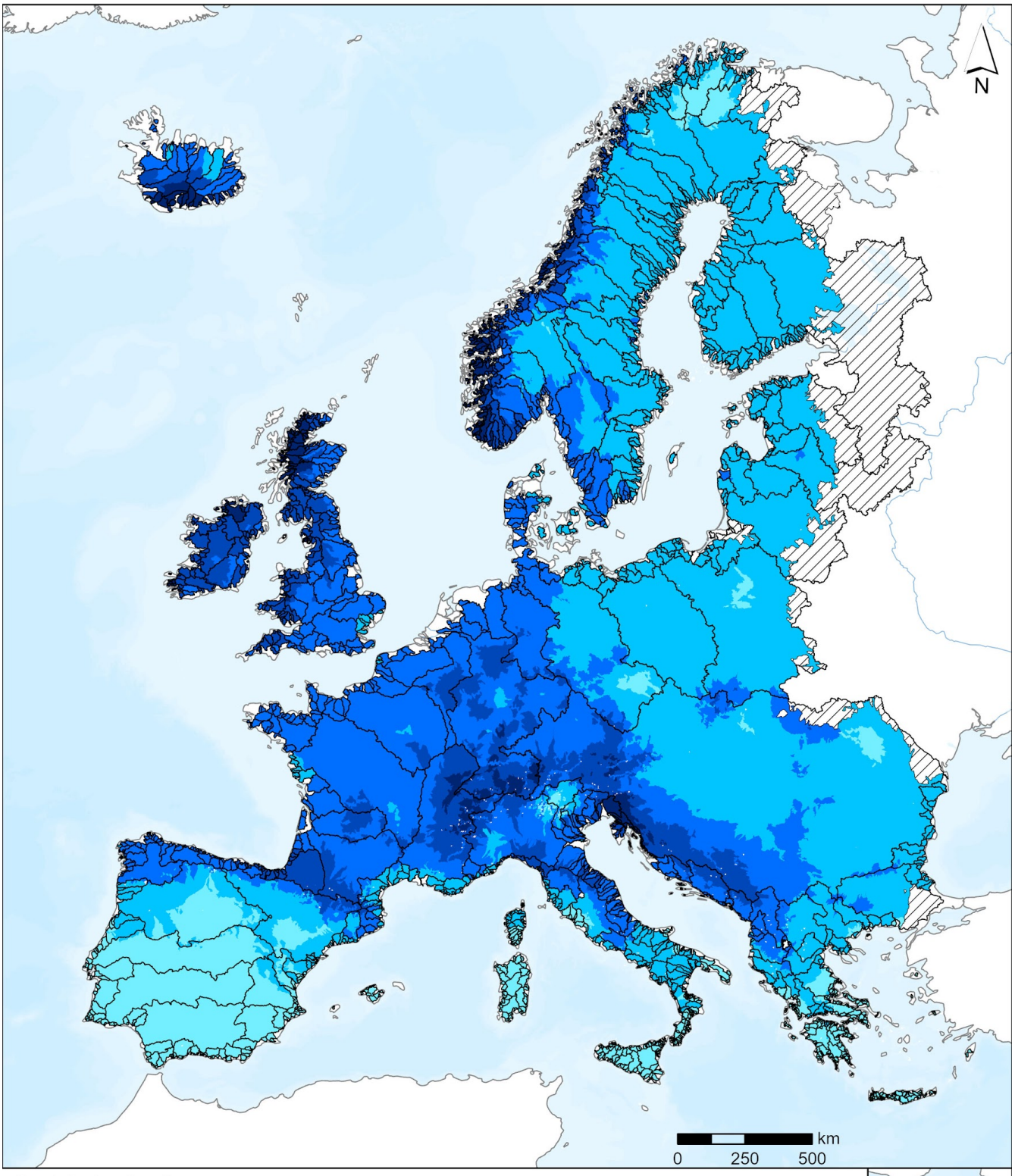
Data source: WorldClim v 2.1

Mean monthly precipitation of the wettest quarter for the period 2021-2040 under ssp585 scenario, in River Units



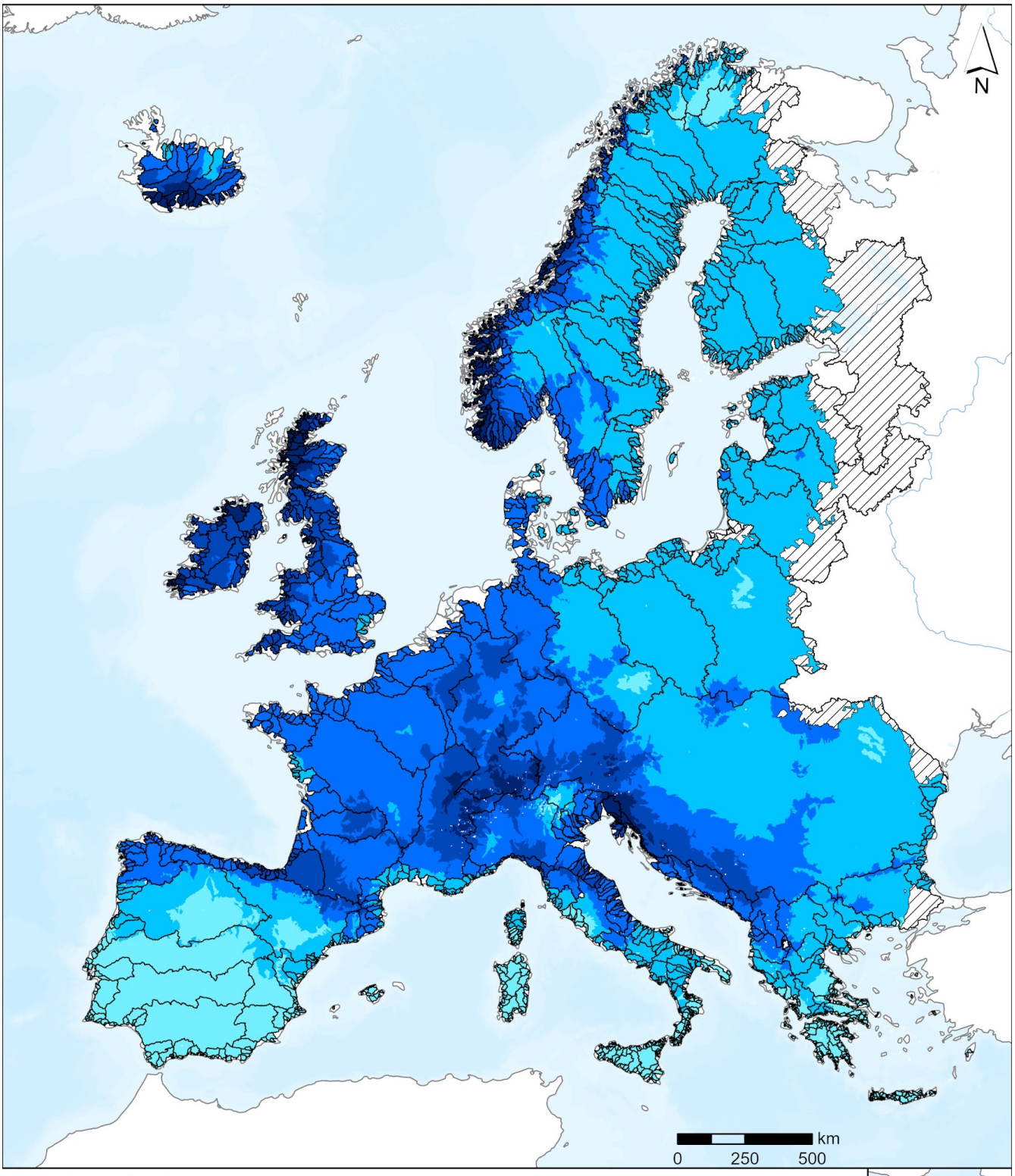
Data source: WorldClim v 2.1

Mean monthly precipitation of the driest quarter for the period 1970-2000, in River Units



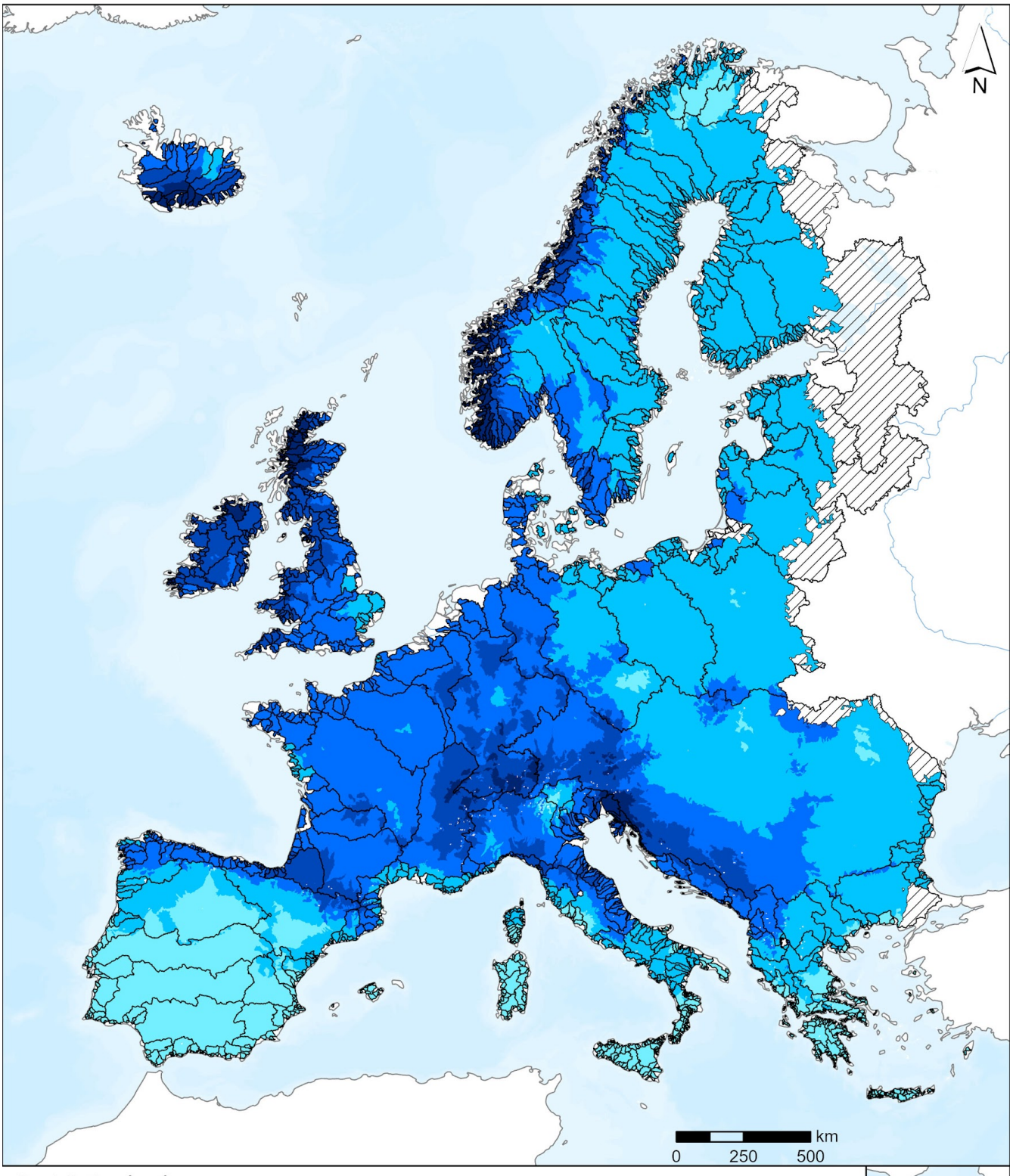
Data source: WorldClim v 2.1

Mean monthly precipitation of the driest quarter for the period 2021-2040 under ssp370 scenario, in River Units



Data source: WorldClim v 2.1

Mean monthly precipitation of the driest quarter for the period 2021-2040 under ssp585 scenario, in River Units



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