

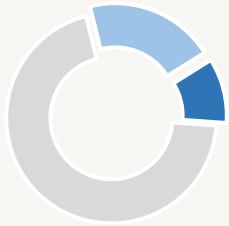
Finding space for conservation in Europe

Co-designing a coherent and resilient network of protected areas
in an EU-wide planning process

Néstor Fernández, Louise O'Connor, Jutta Beher



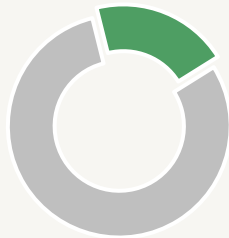
Knowledge support for the implementation of the European Biodiversity Strategy 2030



Legally protect at least **30%** of the land.
At least **1/3** strictly protected

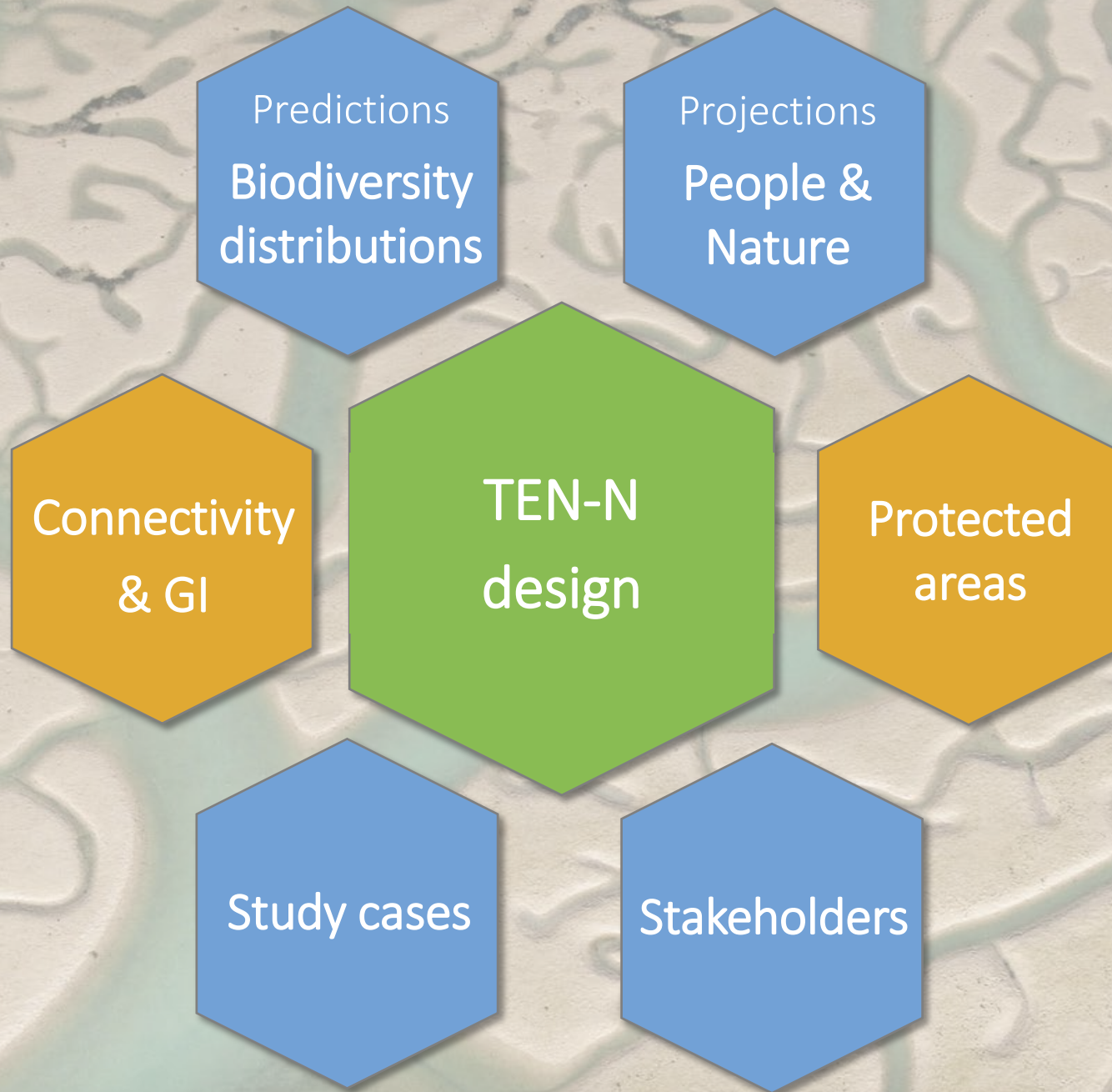


Enhance **ecological connectivity** and increase the **network resilience** to changes

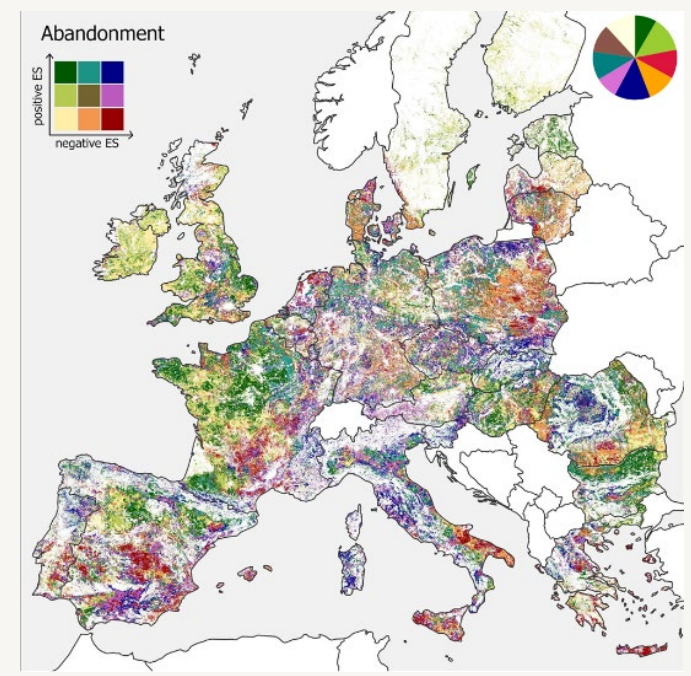
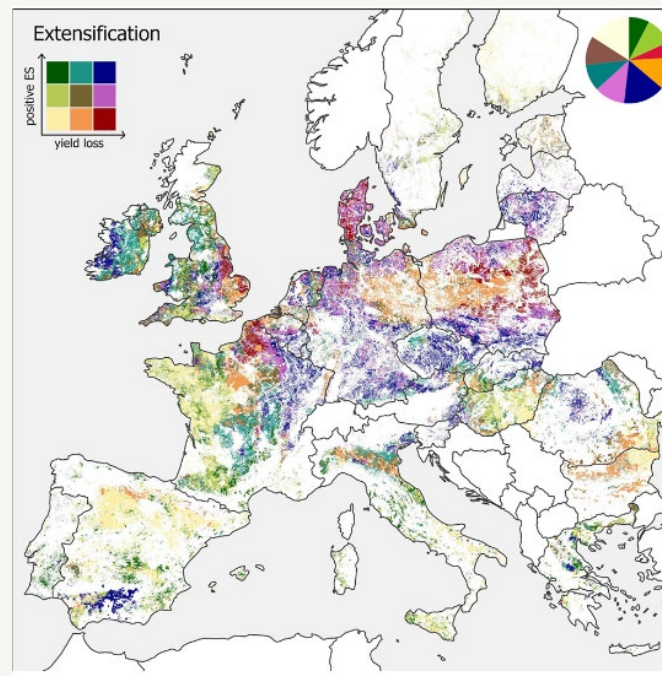
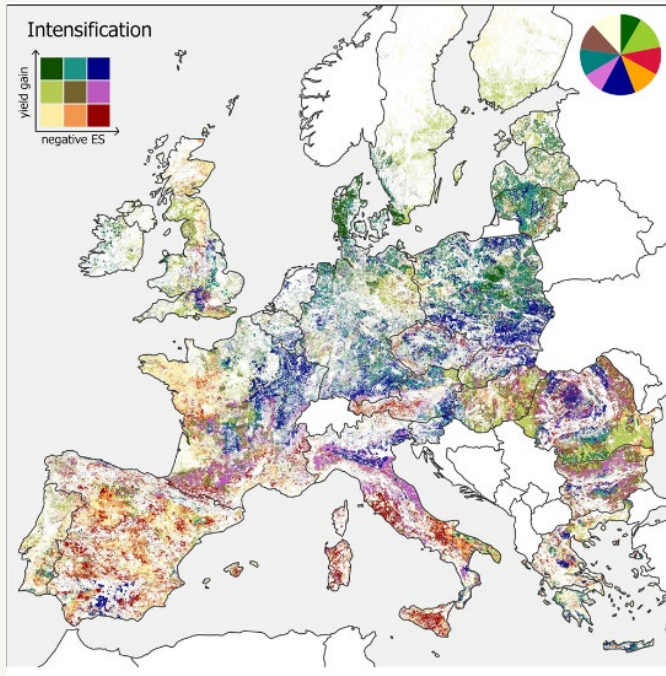


Implement **restoration measures** on **20%** of land





Develop participatory scenarios, integrating climate and land-use projections with pluralistic stakeholders visions



Scenario framework for the Trans-European Nature Network (TEN-N)

D5.1 Scenario framework for TEN-N, translation of NFF storylines into indicators and scenario settings

Nature for Nature



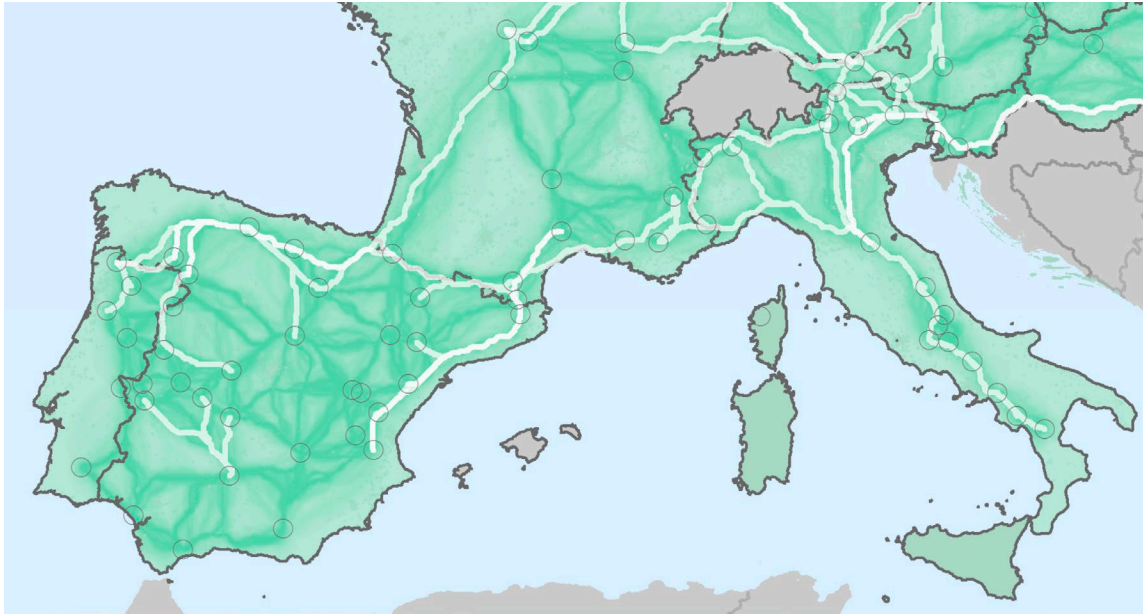
Nature for Society



Nature as Culture



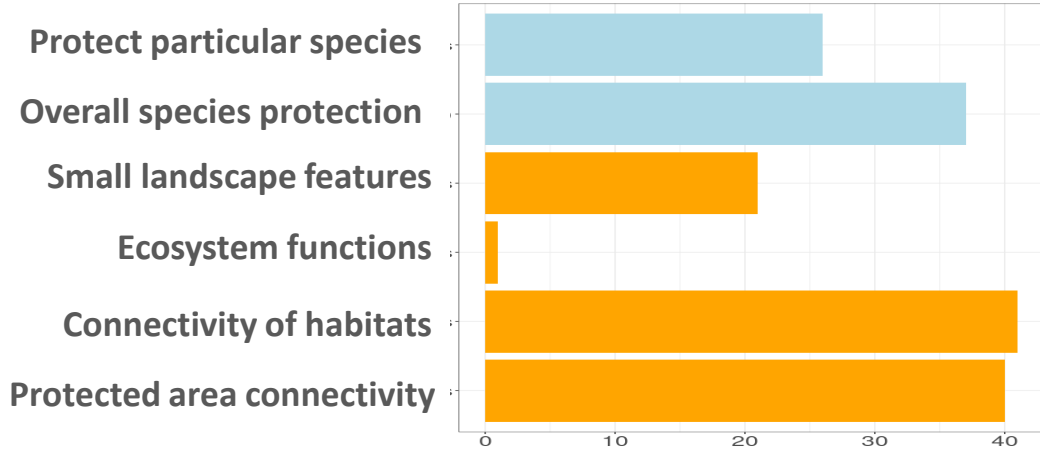
Support the protection and restoration of **multifunctional corridors**



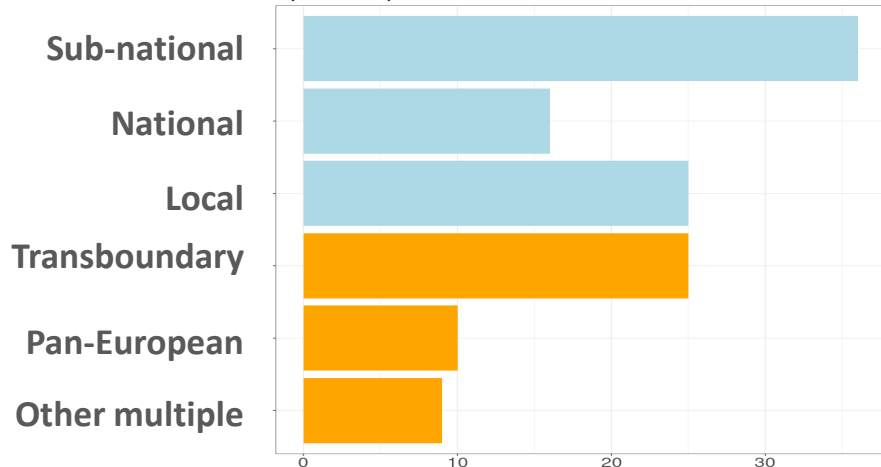
- **Guidelines, data and tools for connectivity conservation** for designing corridors from local to pan-European scales
- **Conservation and restoration priorities** to increase the **resilience** of the network

Connectivity projects in EU

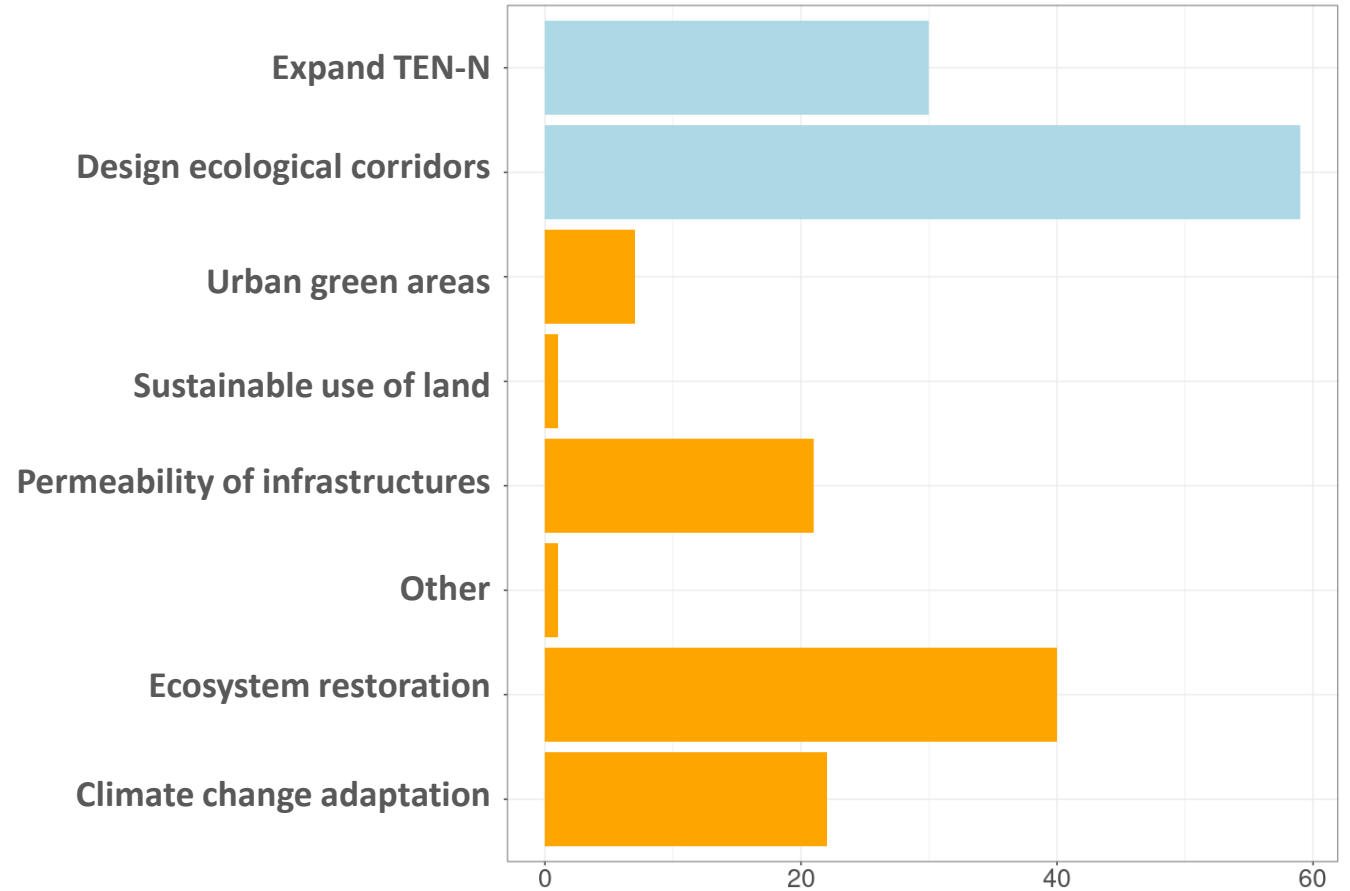
Connectivity goals



Spatial scope

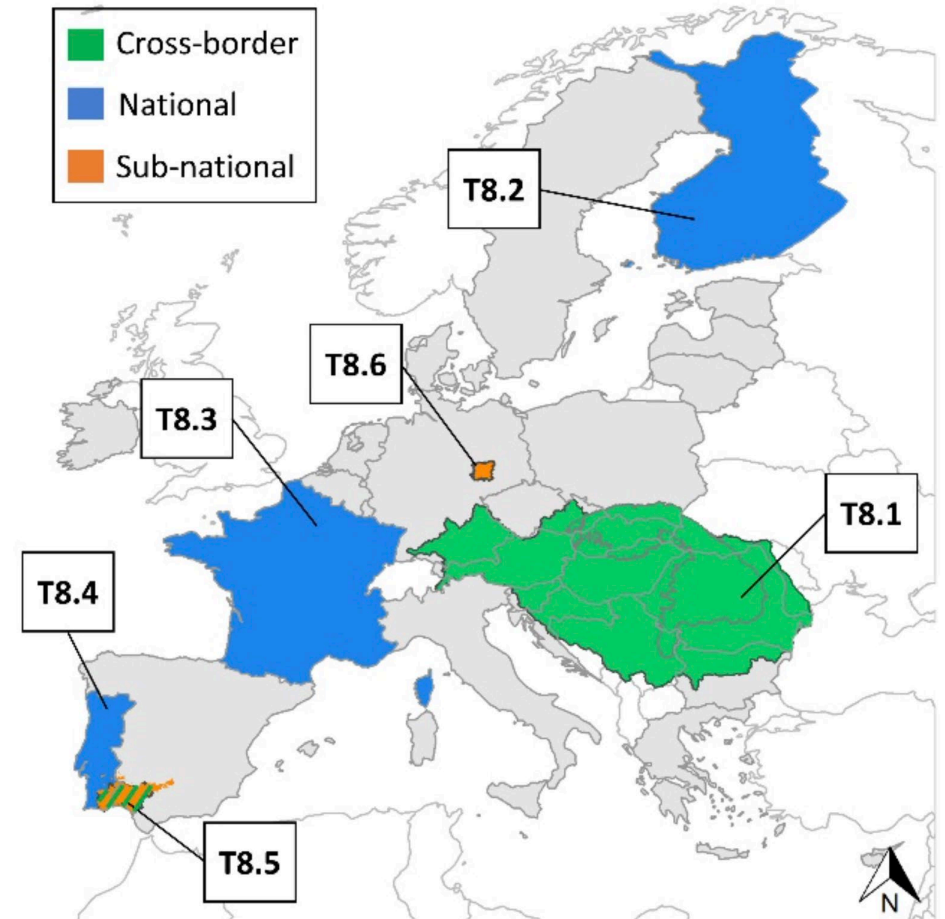


Project topics



Review current practices, co-designing novel tools and guidelines, and support monitoring and reporting

- Planning support tools
- Stakeholders Community & Moodle
- Financial and policy reviews and guidelines
- **Support monitoring and reporting of TEN-N performance**

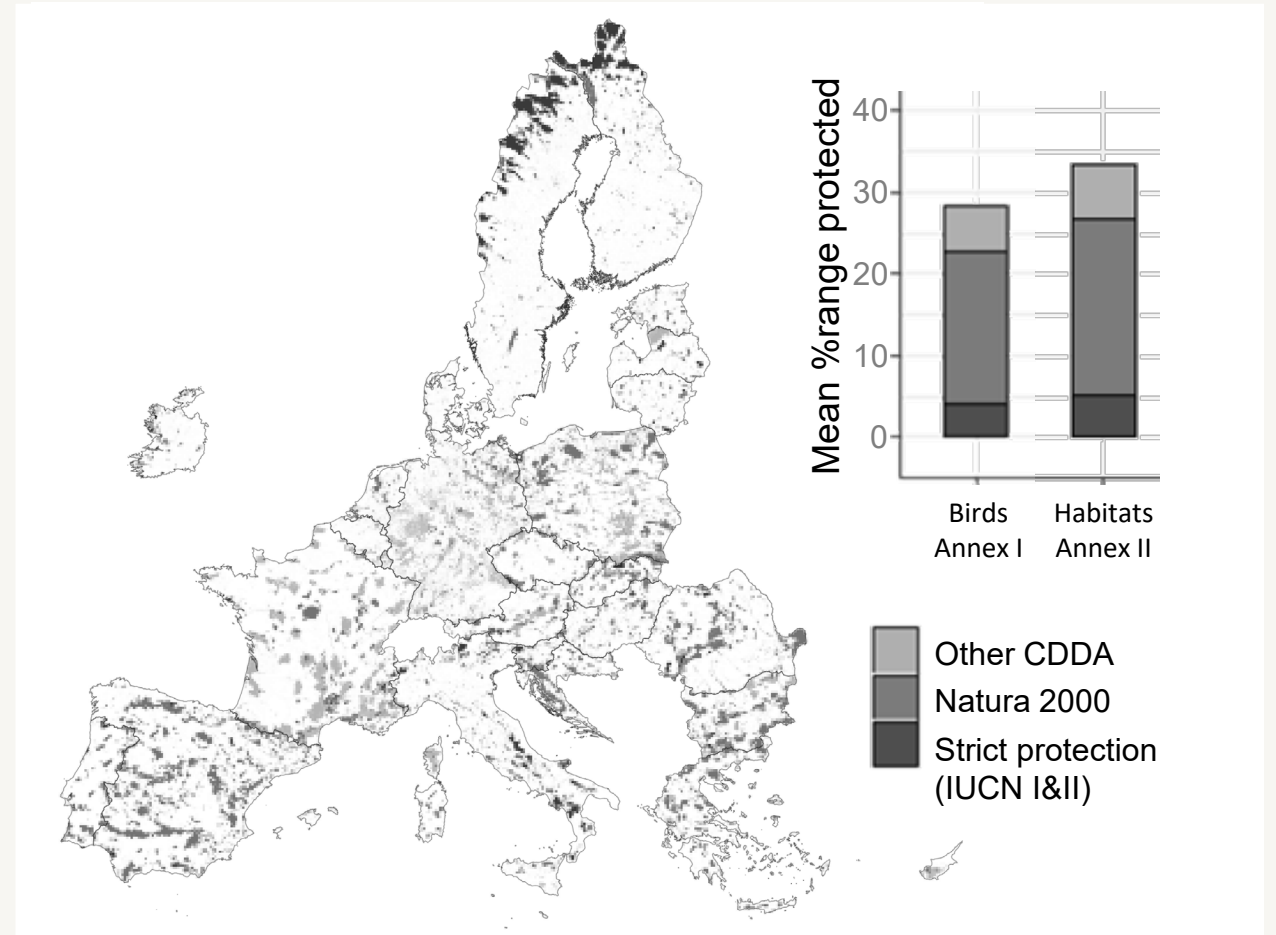


Define a blueprint for TEN-N that addresses **gaps in ecological representativeness** of the protected area network

- **Spatial priorities for national and international designations** to support TEN-N and reduce conservation gaps.






Where to conserve, restore and sustainably manage ecosystems in Europe?

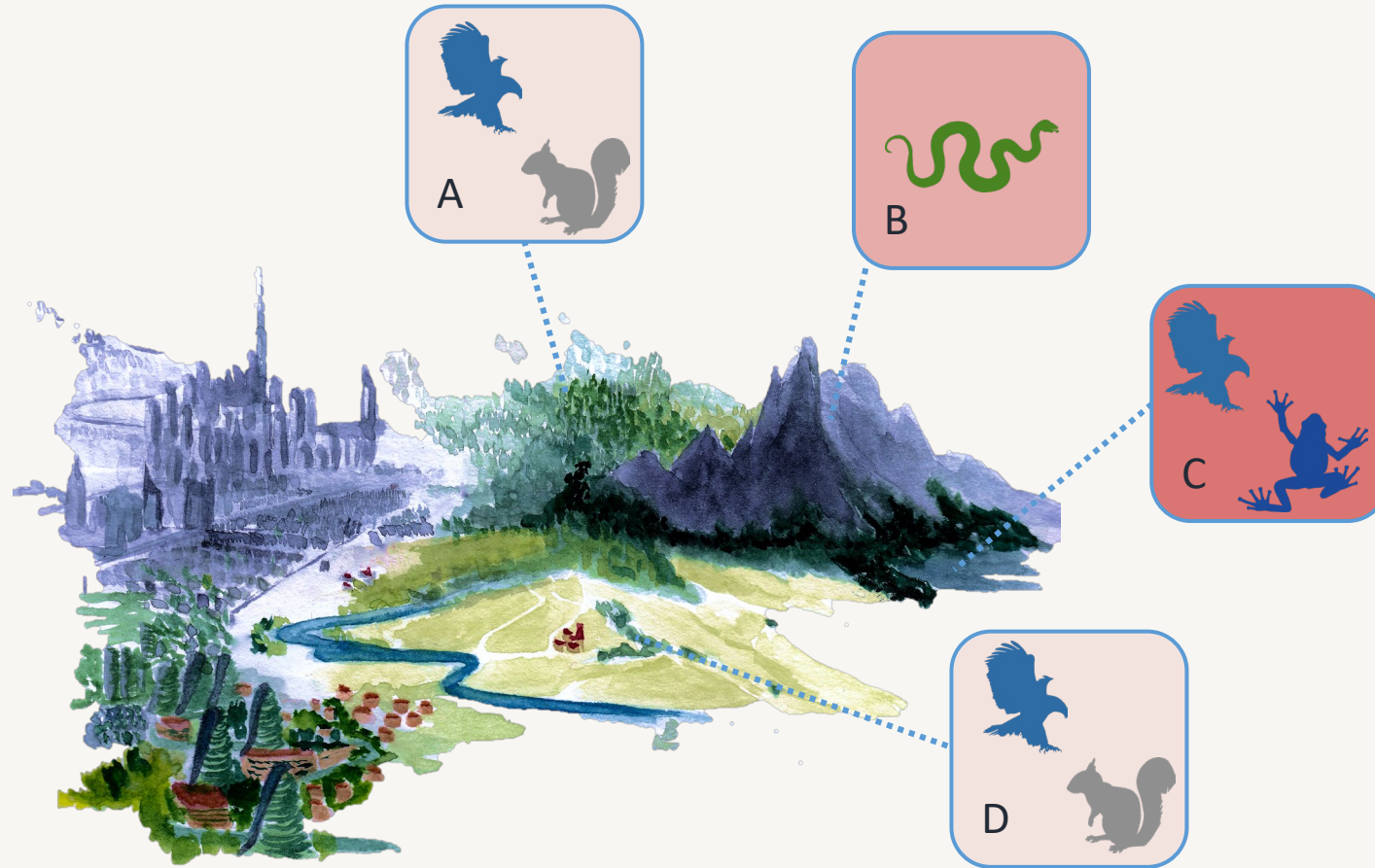


European protected areas cover ~26% of land, (including ~18% by Natura2000 sites)

How to identify priority areas for conservation?

Spatial conservation prioritization: a tool to maximize gains given constrained resources

Number of occurrences:	
	3
	2
	1
	1



How to identify priority areas for conservation?



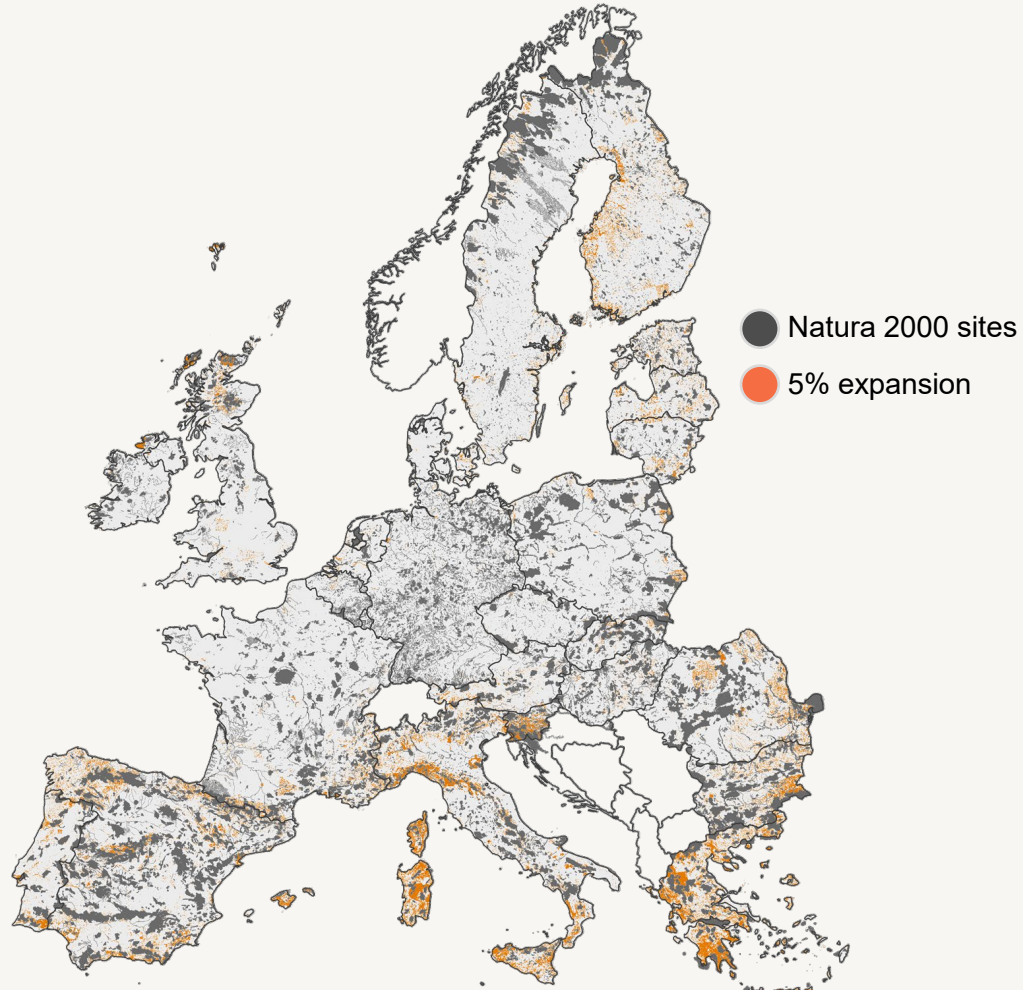
prioritizr/prioritizr

Systematic conservation prioritization in R

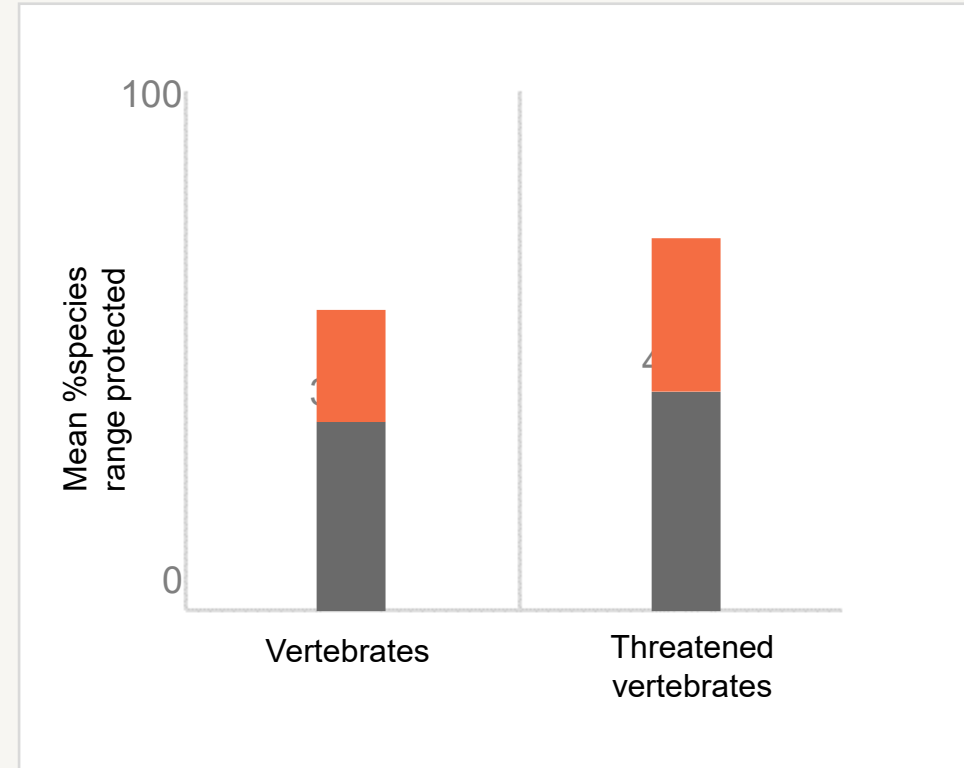


MARXAN
conservation solutions

Large conservation gains are possible in few areas

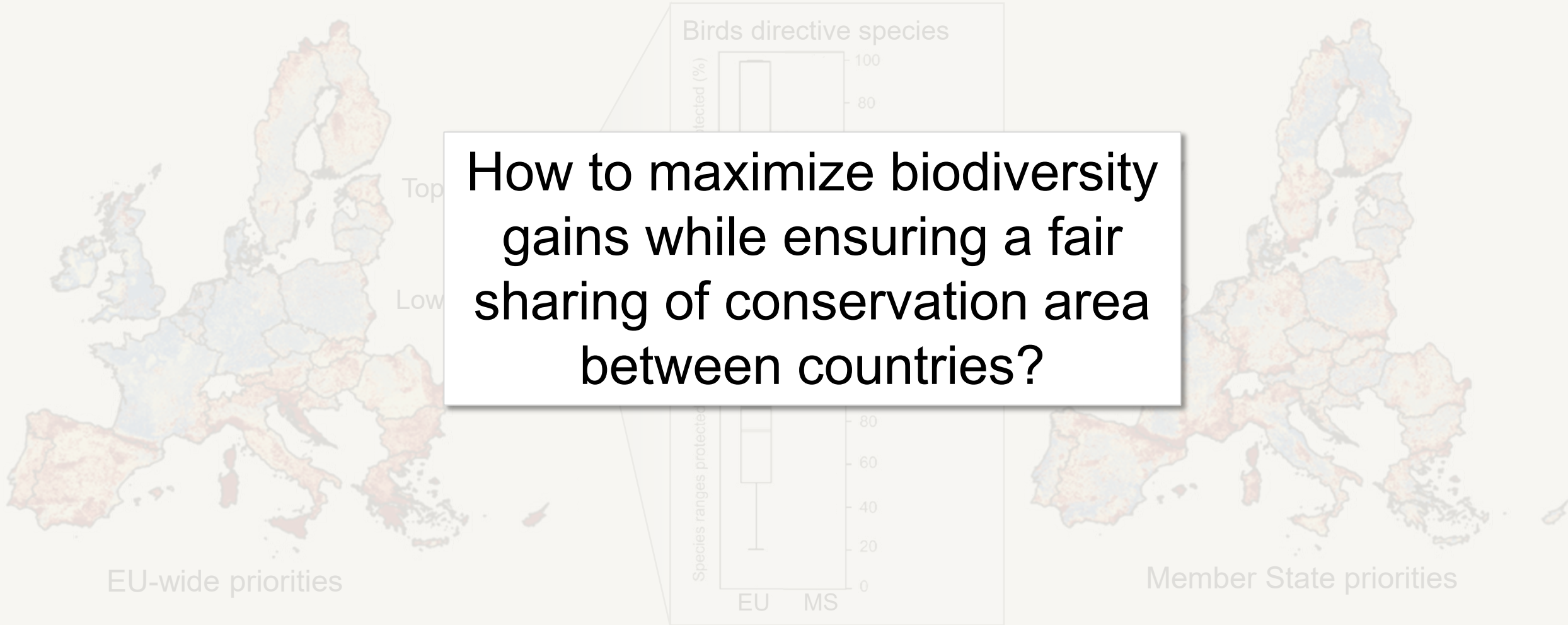


5% expansion of Natura 2000 network when focusing on terrestrial vertebrates



Just a small amount of protected area expansion **in the right places** can make a big difference!

Planning at the European scale is more cost-effective




What are we planning for?


Species and Habitats in Articles 12 and 17


 mammals

 birds

 reptiles

 amphibians

 plants

 arthropods



Threatened species and ecosystems

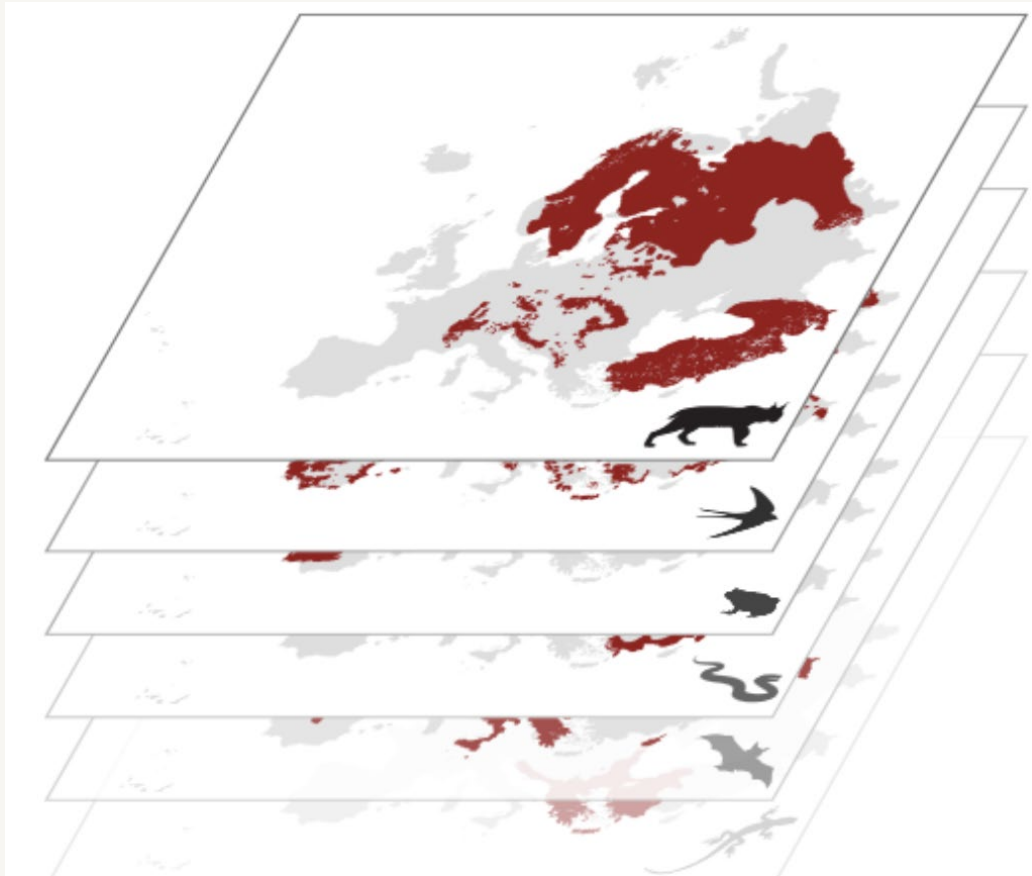


Other important ecosystems



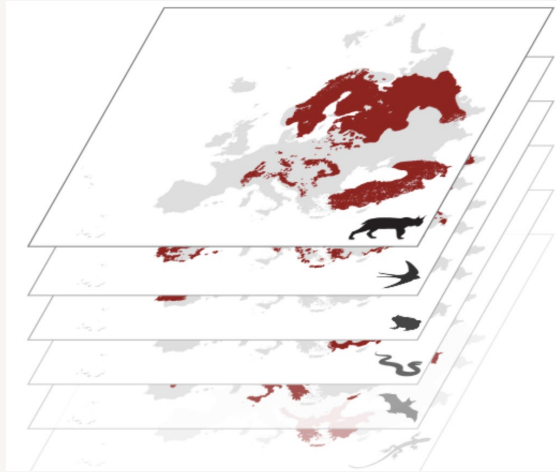
Carbon sequestration

Primary and old-growth forests

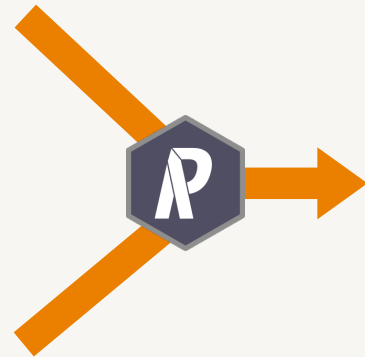
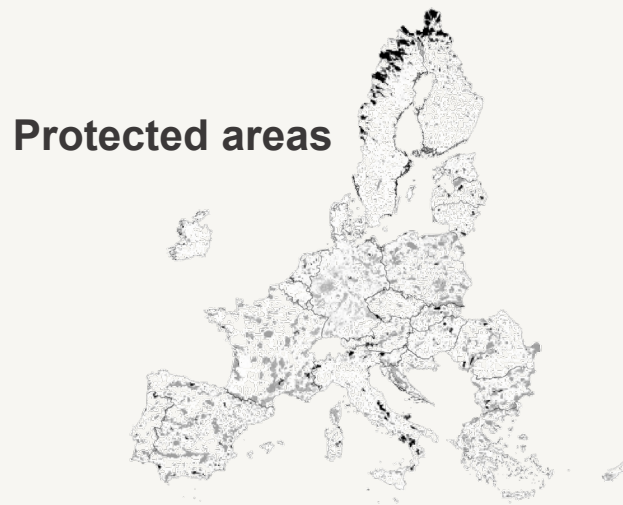


Methods for preliminary analysis

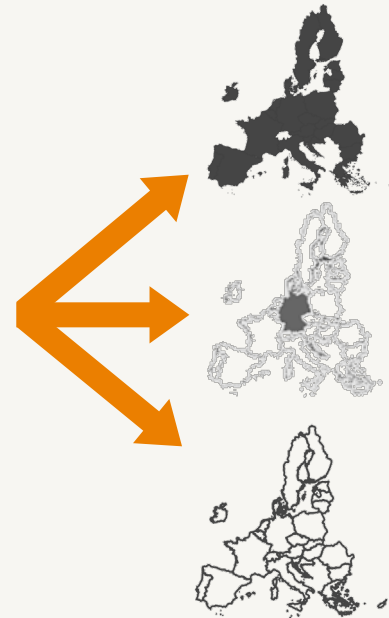
Species & Habitats of conservation concern



- + **Targets**
how much is enough?
- + **Weights**
how important is it to protect each species?



Scenarios for protected area expansion



EU-wide priorities

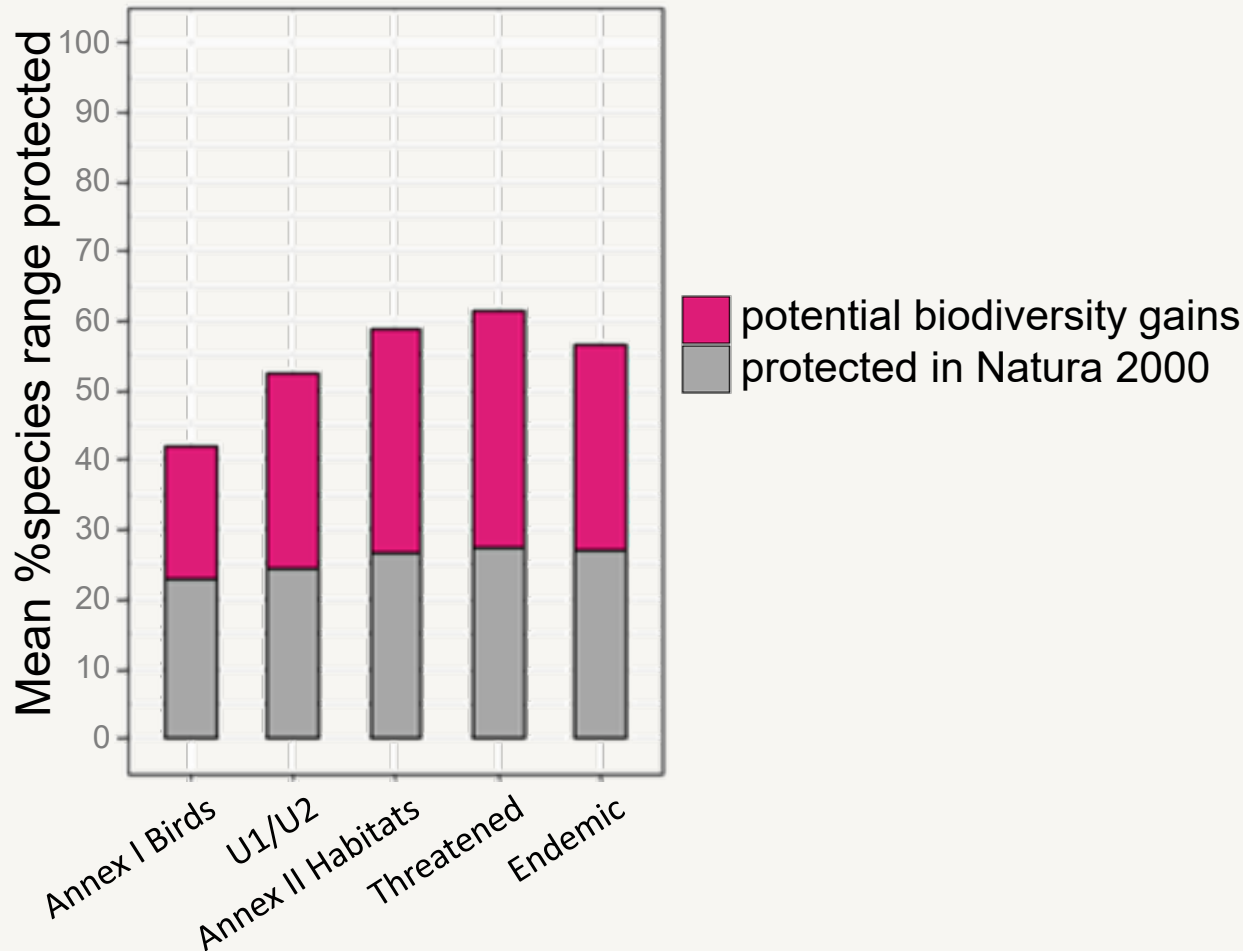
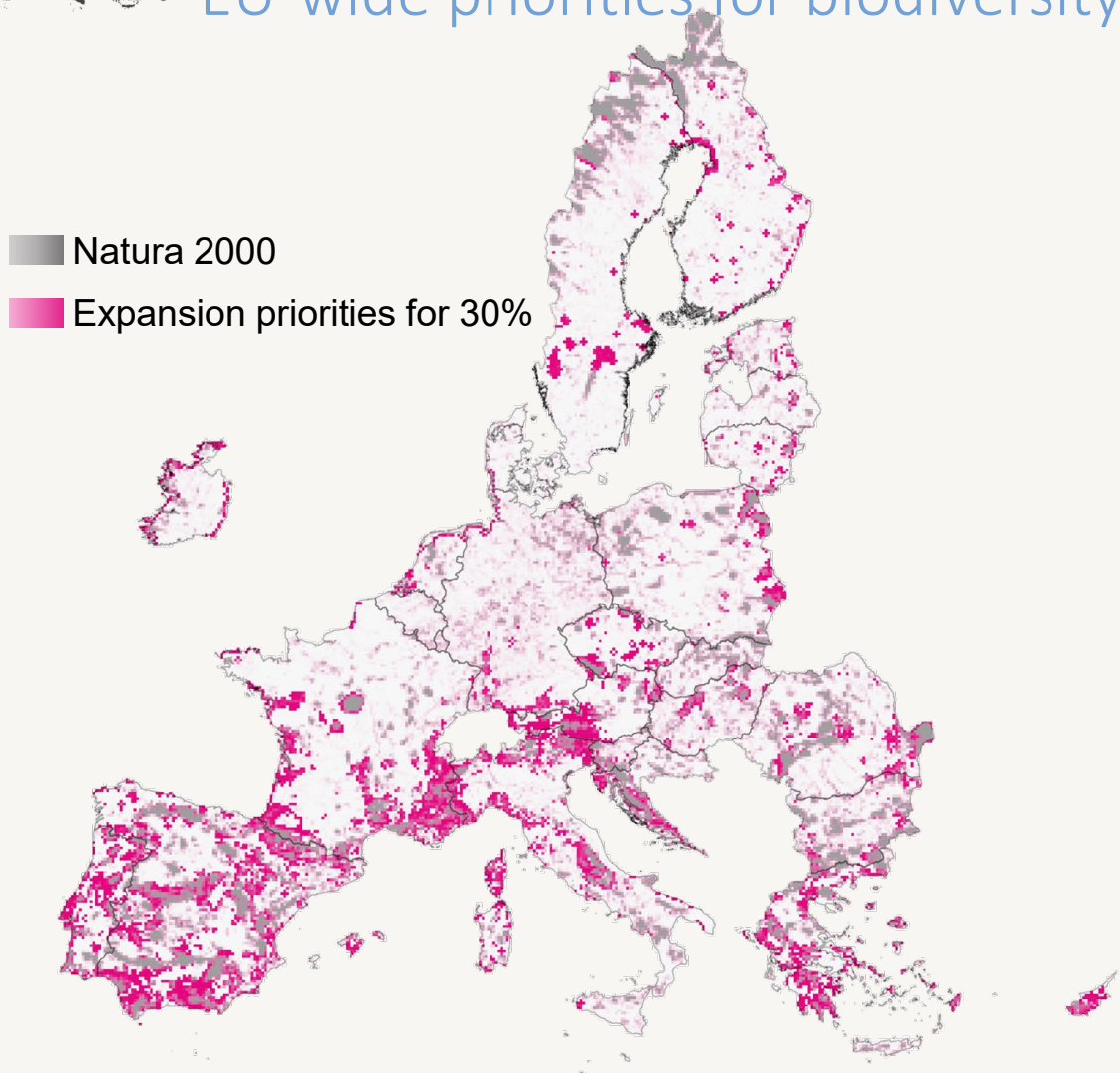
Member State priorities

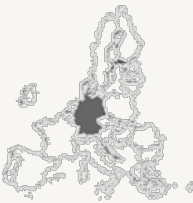
EU-wide with equal area shares between countries



EU-wide priorities for expanding Natura 2000

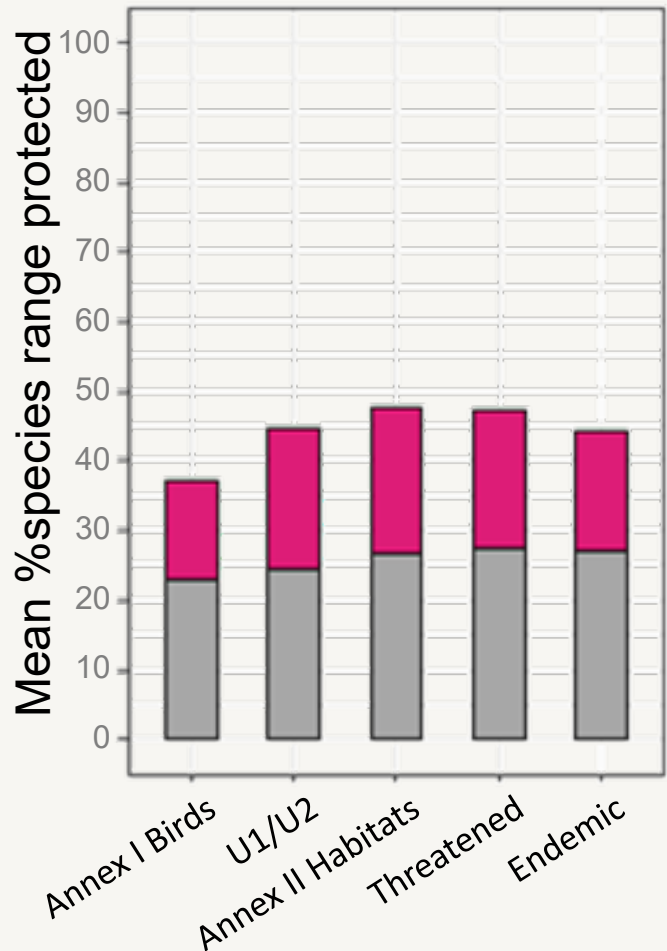
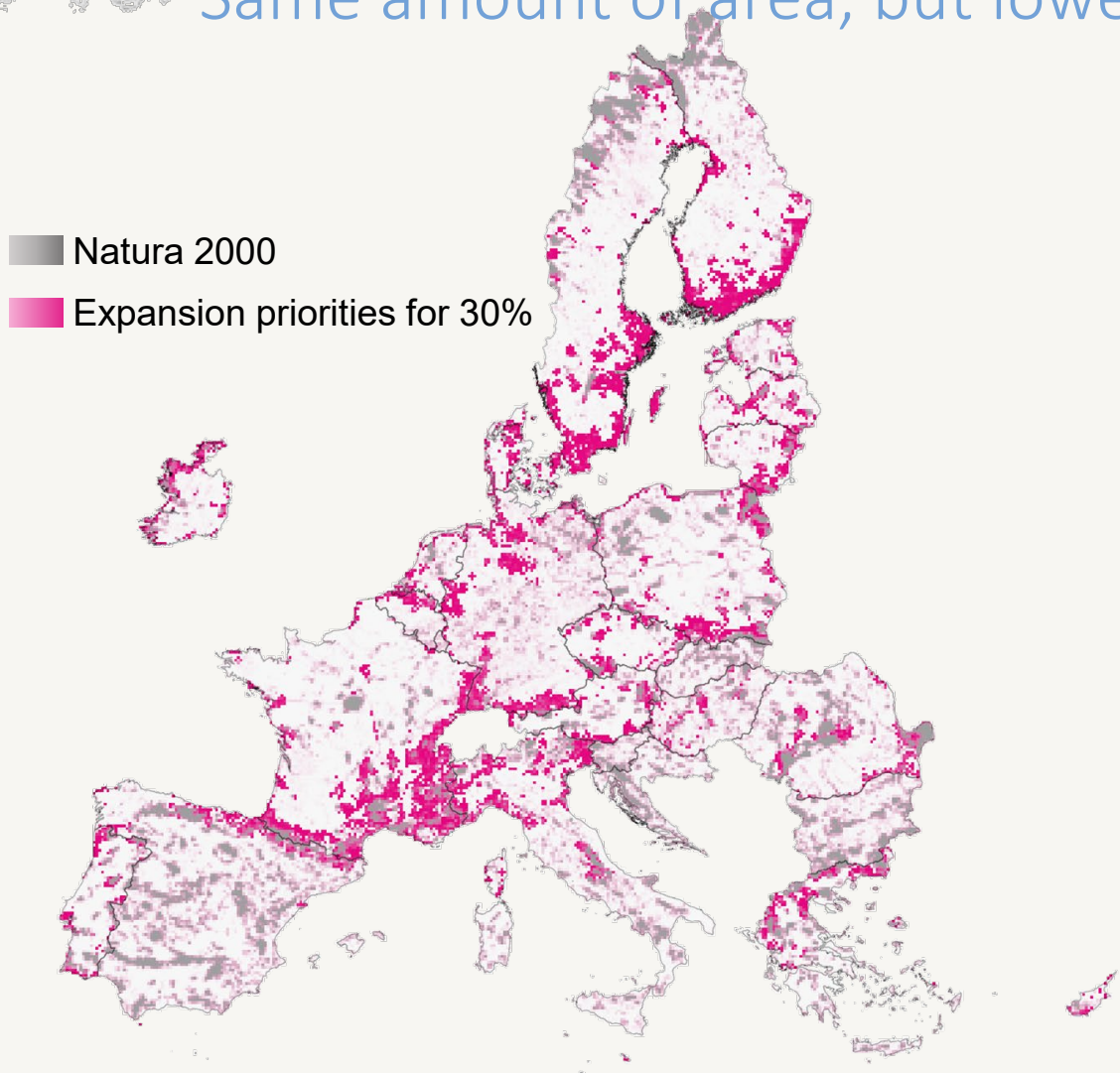
EU-wide priorities for biodiversity are unevenly distributed across countries





National priorities for expanding Natura 2000

Same amount of area, but lower biodiversity gains

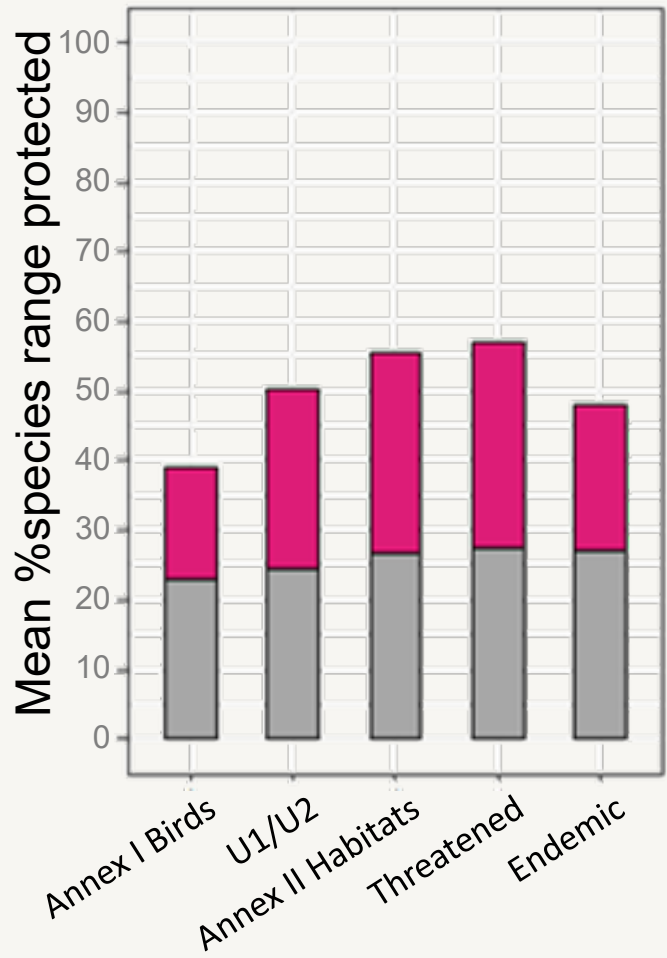
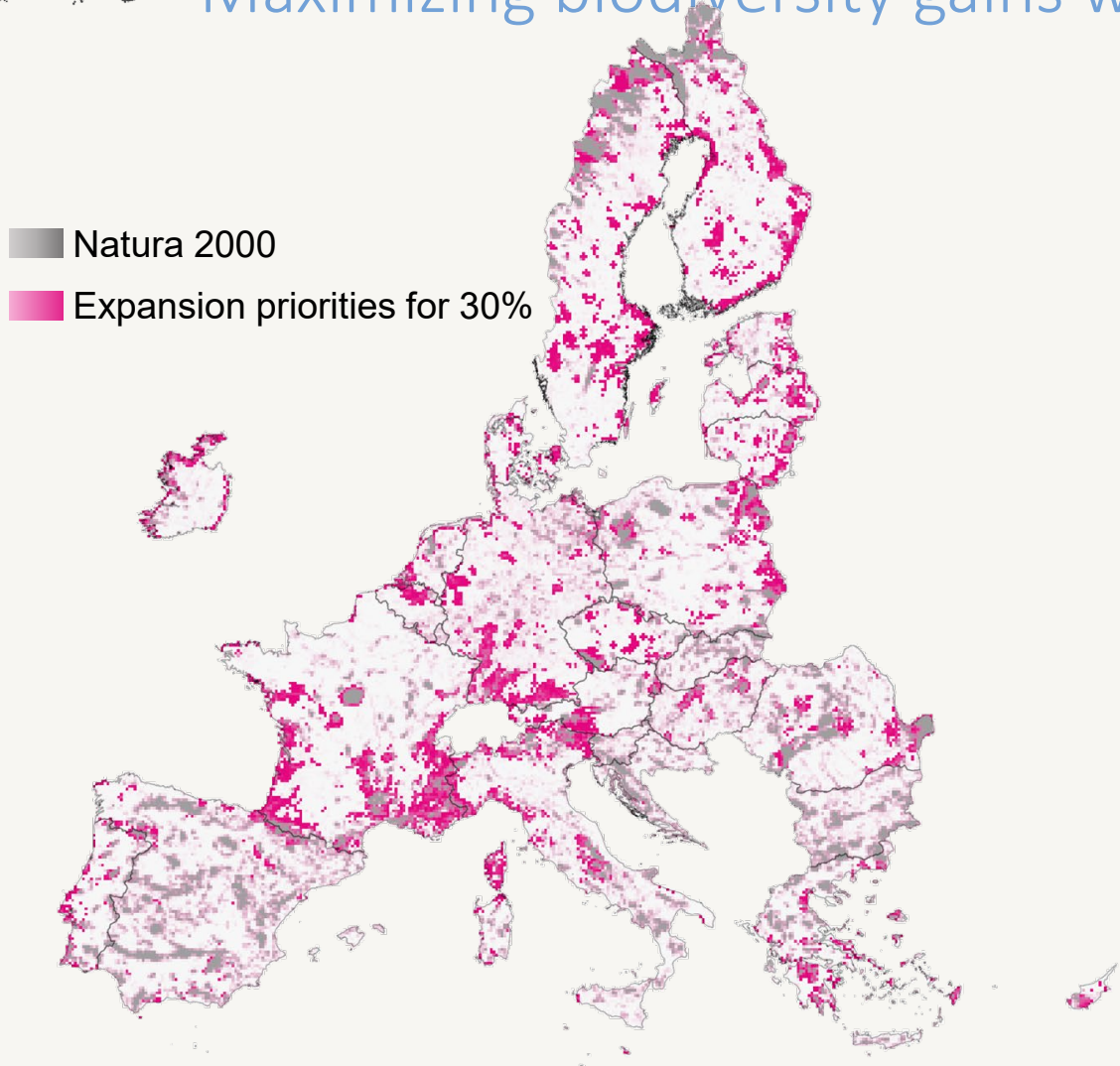


■ potential biodiversity gains
■ protected in Natura 2000



EU-wide priorities with equal area shares

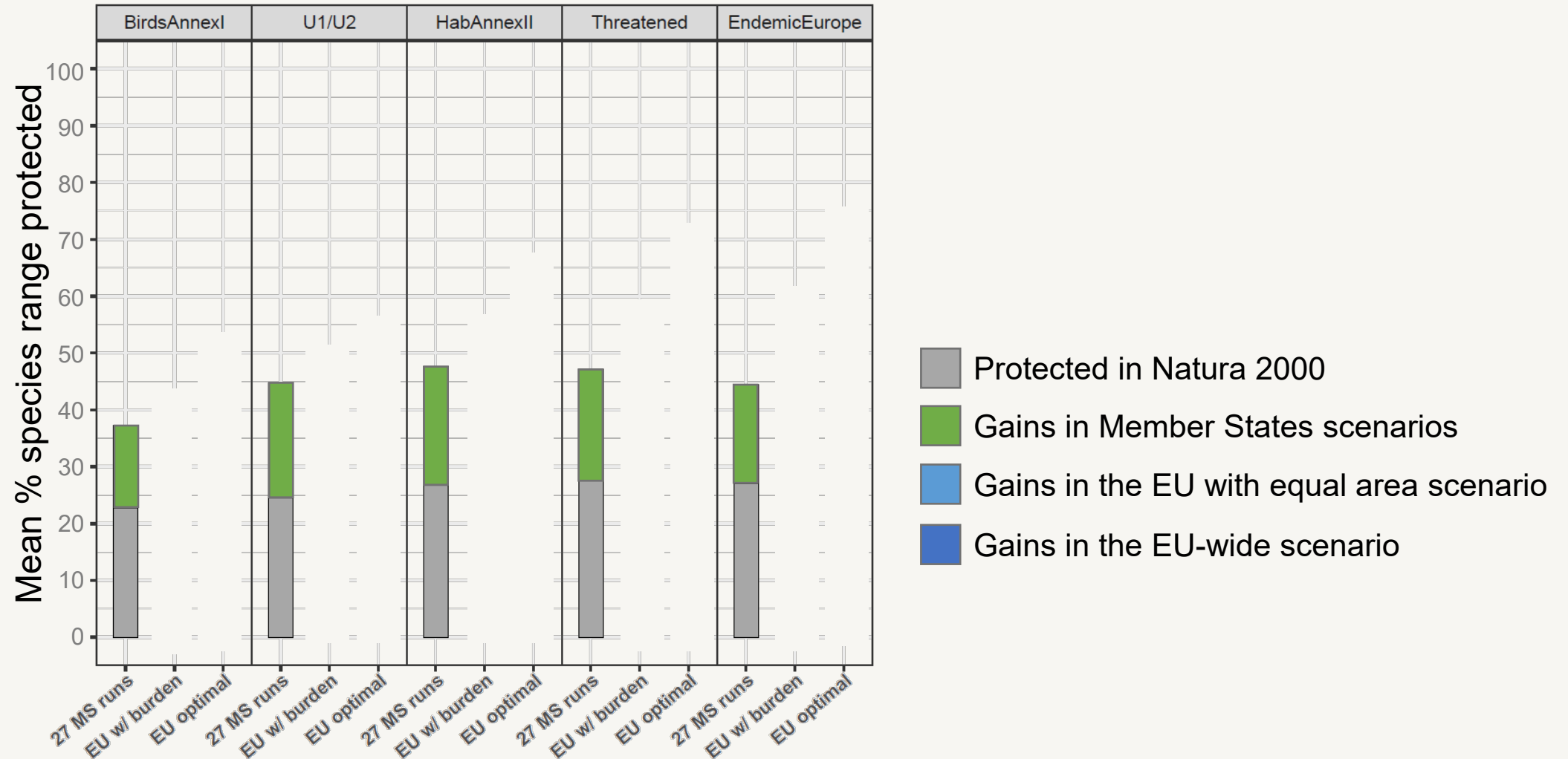
Maximizing biodiversity gains with equal sharing of conservation areas



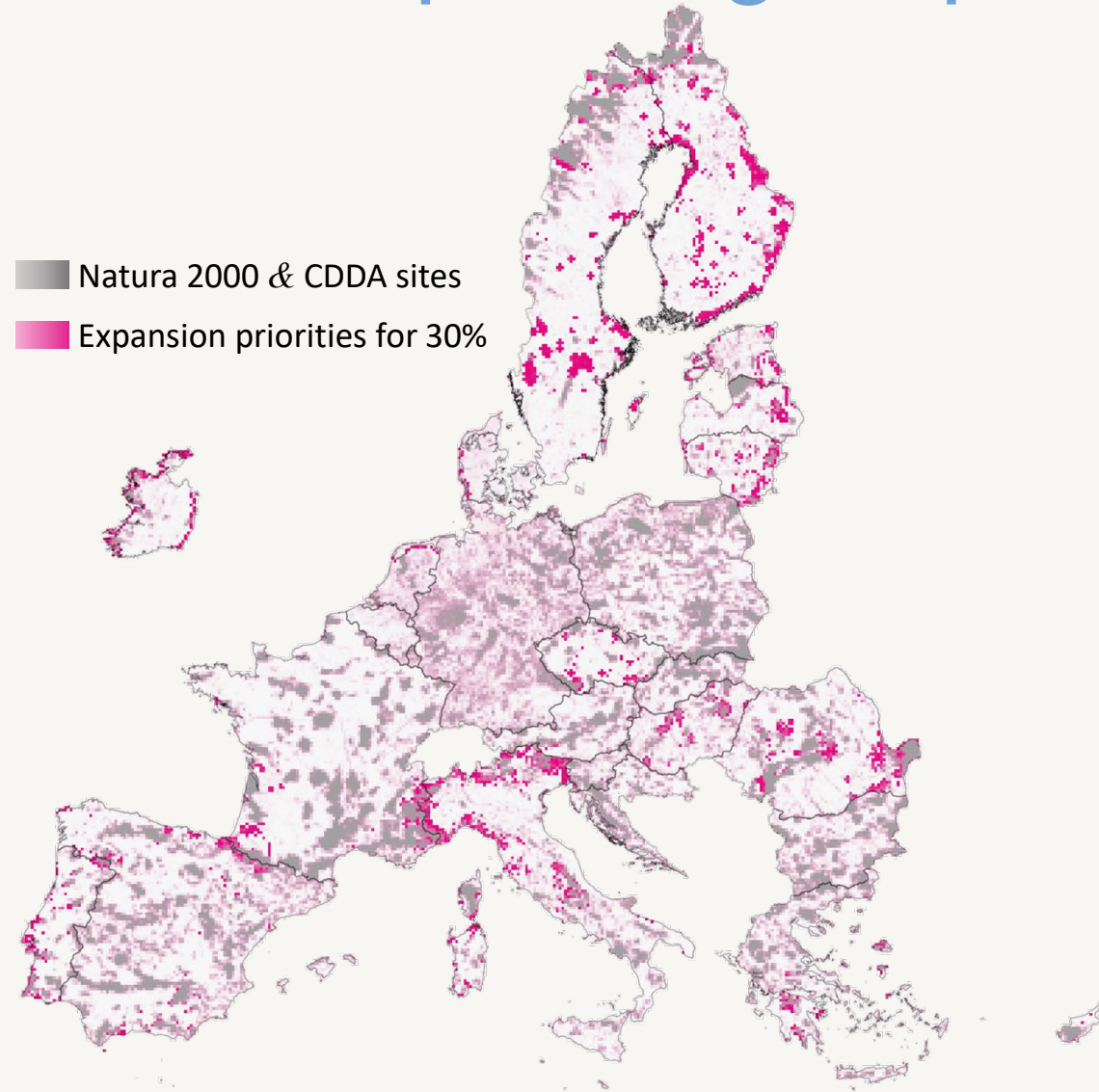
■ potential biodiversity gains
■ protected in Natura 2000

Planning at EU scale increases conservation gains

Collaboration across Member States is key to achieve best conservation outcomes!



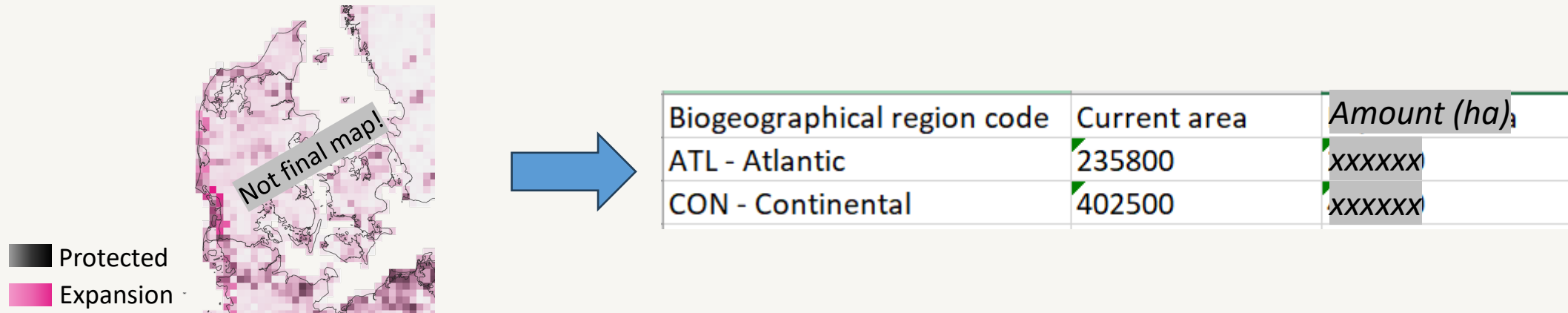
Top priorities for expanding all protected areas



Expansion priorities to reach 30% protected area coverage considering all CDDA and Natura2000 sites

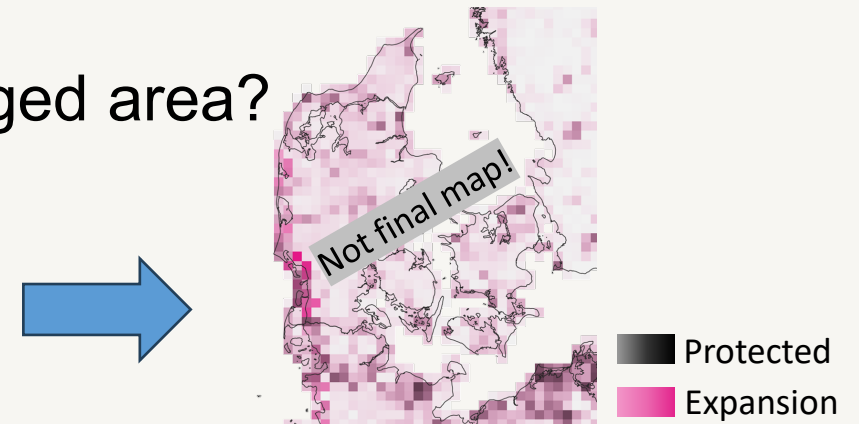
Ways in which we can inform the pledges

1. How much area should be protected per Member state Biogeographic region to be as cost-effective as possible at the EU level?



2. Where are the best areas to protect given the pledged area?

Biogeographical region code	Current area	Expected area
ATL - Atlantic	235800	235800
CON - Continental	402500	402500



Protected areas for the future, for nature and people



What do you want us to consider in the analysis?

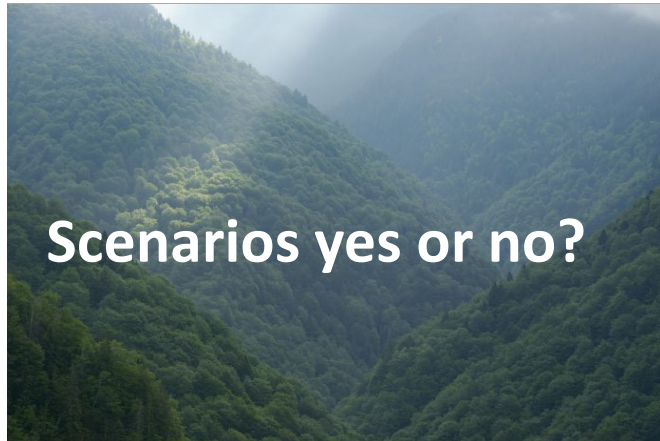
12 responses from our survey

Type of questions in our survey	30% target	10% strict target
Biodiversity priorities / criteria		
Regulatory & cultural services of nature		
Economic, technical and political considerations		
Ideas and preferences on relative contribution of countries		

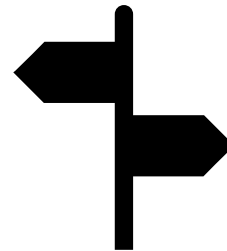
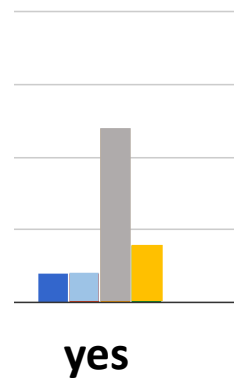
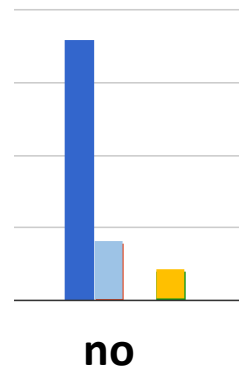
Agreement and disagreement

Why we need to hear back from many of you

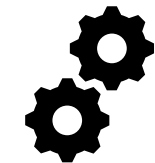
■ strong agree ■ agree ■ undecided ■ disagree ■ strong disagree



Strict protection



Same rules or different?



Possible to produce?

How to get in touch

**Be informed,
but not talk**

**Be heard,
but not talk**


**Discuss with us or
get access to data /
resources**

**Be involved in
general, or co-design
an analysis for your
MS**



**Sign up to our
newsletter and
stakeholder
community!**



 Sign up here



Fill in our survey!



Spatial data

Connectivity



Systematic
Conservation
Planning

Contact us and we make a time and date to talk!

naturaconnect@iiasa.ac.at

beher@iiasa.ac.at

visconti@iiasa.ac.at

Come talk to us!

We hope to be collaborating with you over the next few years

contact us anytime:



naturaconnect.eu



naturaconnect@iiasa.ac.at



[@naturaconnect](#)



supplementary slides







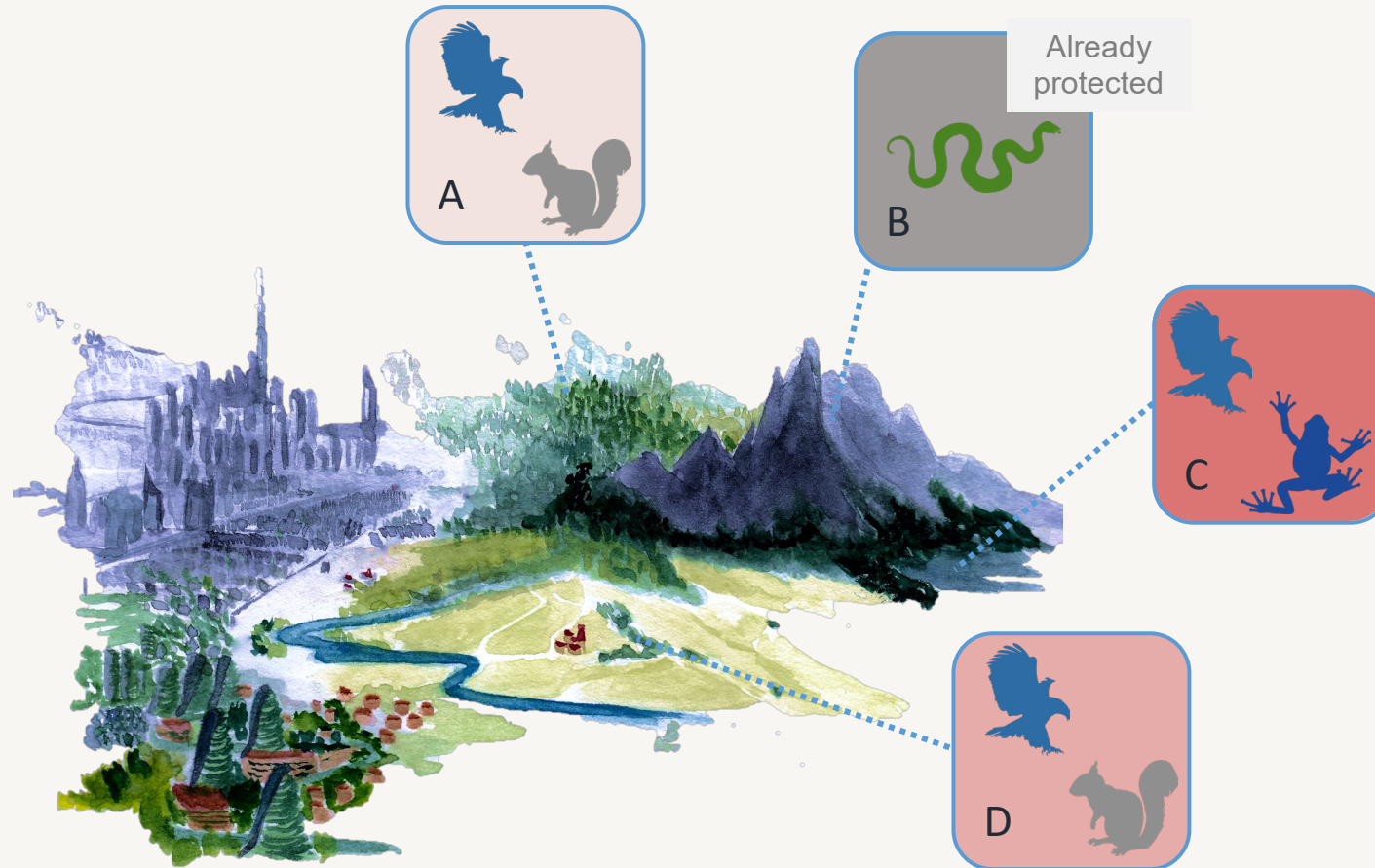
NaturaConnect receives funding under the European Union's Horizon Europe research and innovation programme under grant agreement number 101060429. The contents of this material are the sole responsibility of the NaturaConnect consortium and do not necessarily reflect the opinion of the European Union.







Funded by
the European Union

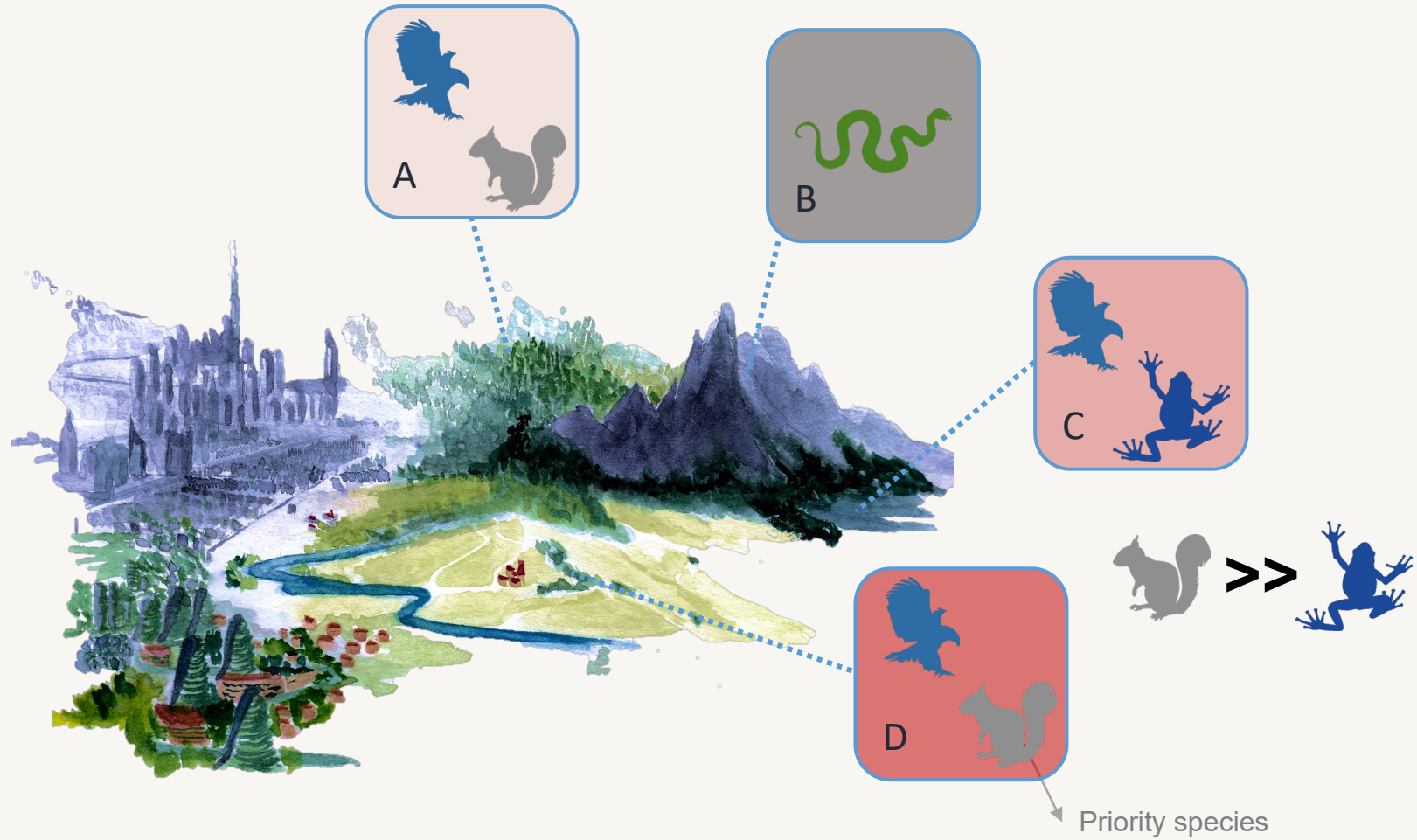
Priorities change depending on... what is protected

Number of occurrences:	
	3
	2
	1
	1



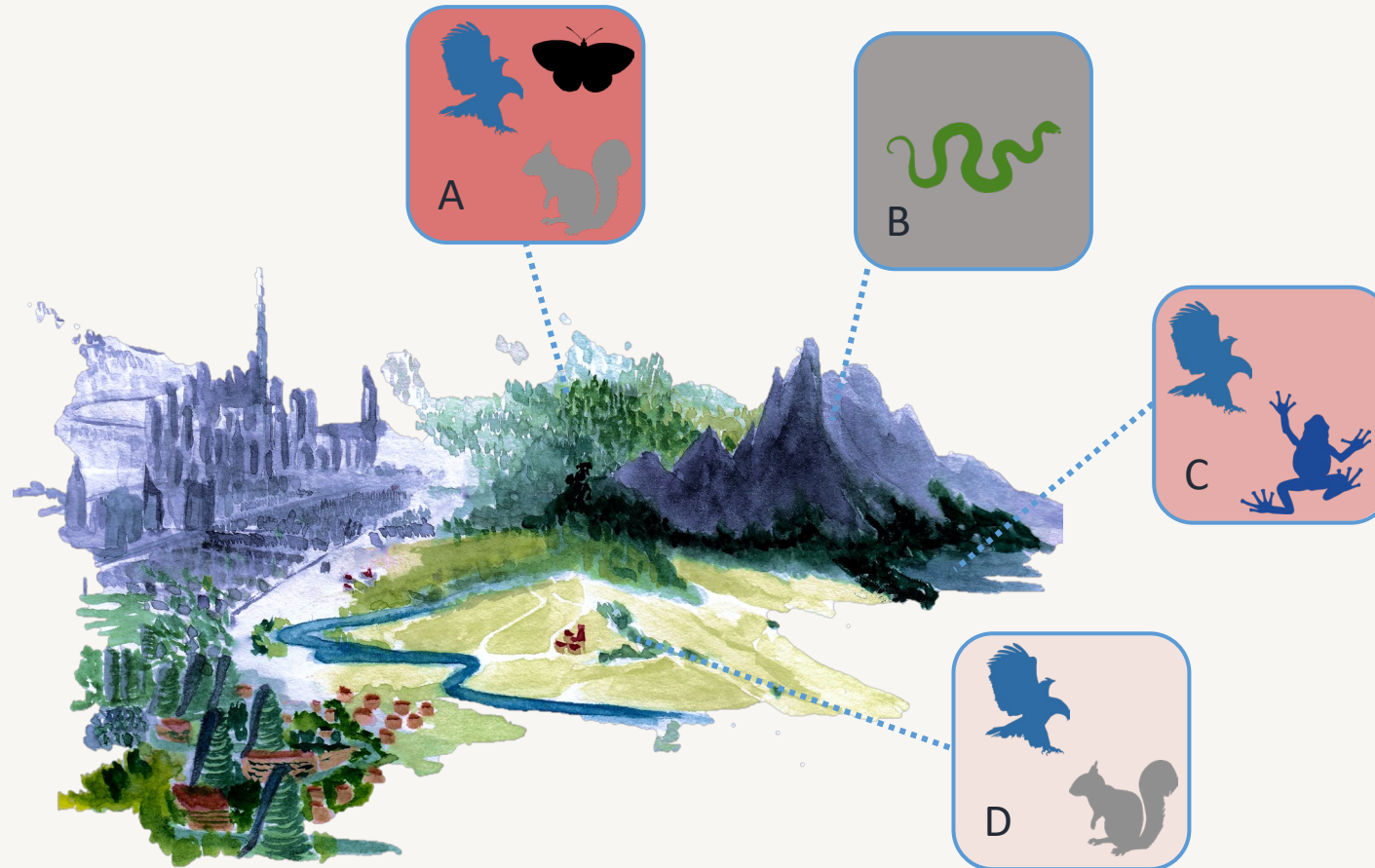
Priorities change depending on... what we value

Number of occurrences:	
	3
	2
	1
	1



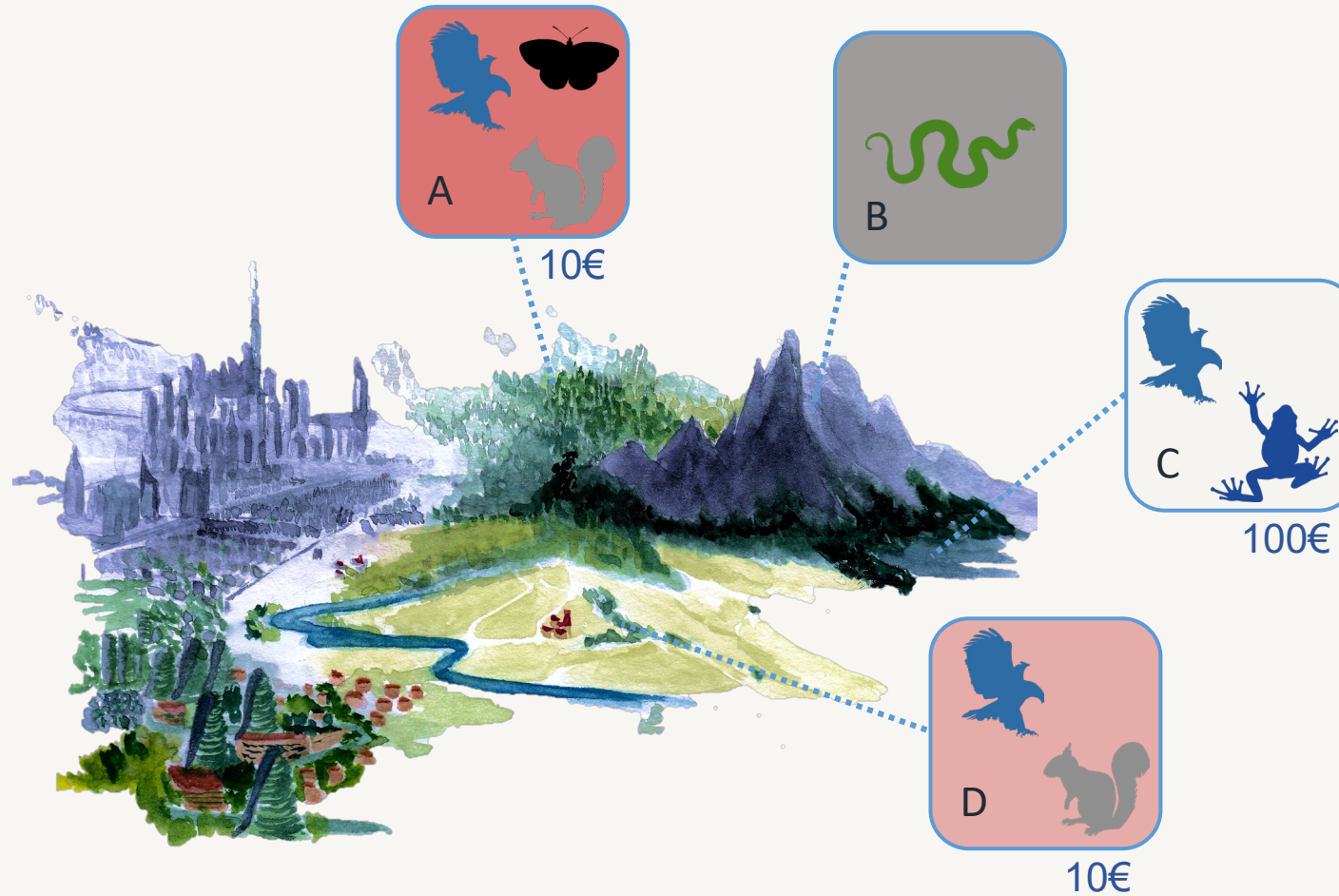
Priorities change depending on... species included

Number of occurrences:	
	3
	2
	1
	1
	1

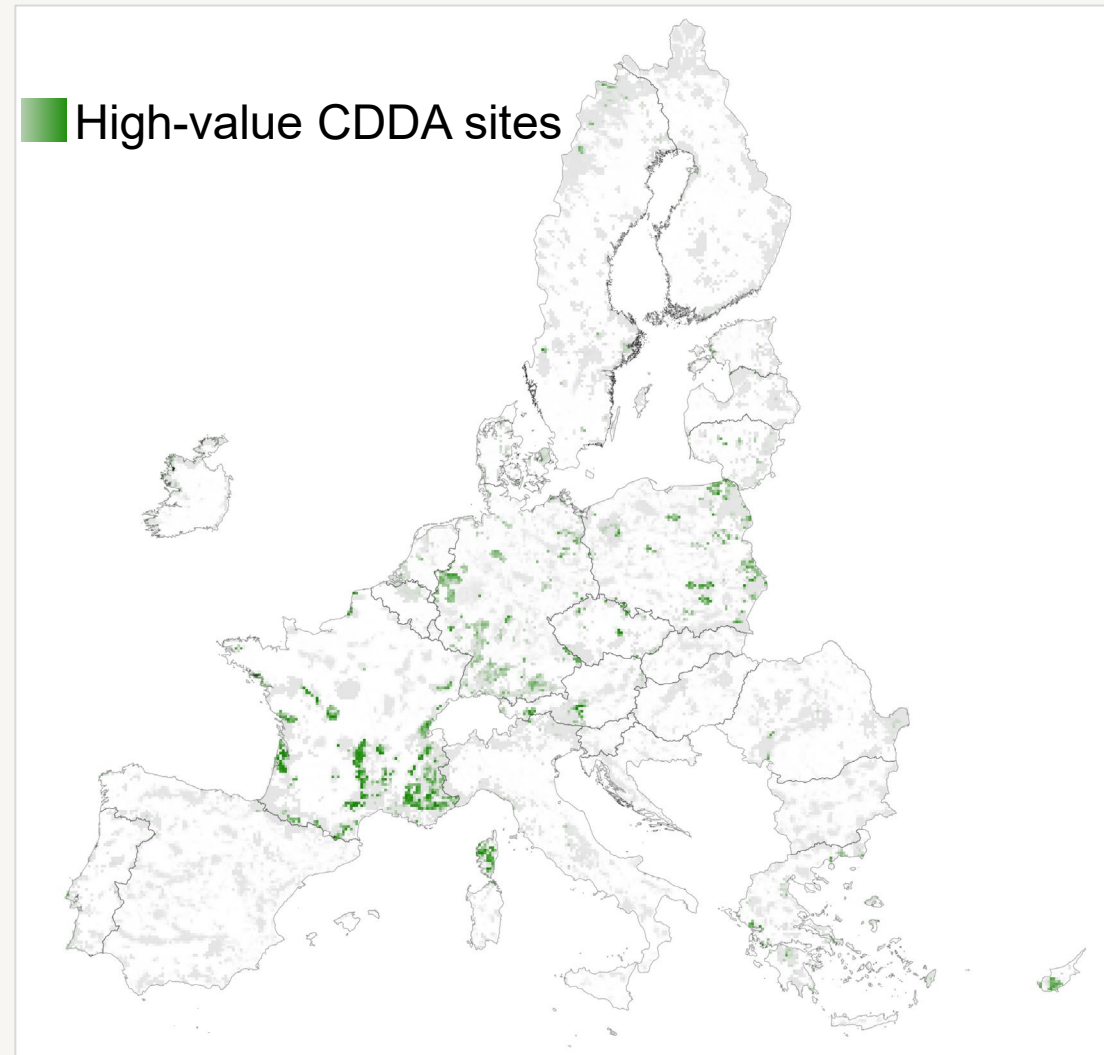


Priorities change depending on... costs

Number of occurrences:	
	3
	2
	1
	1
	1

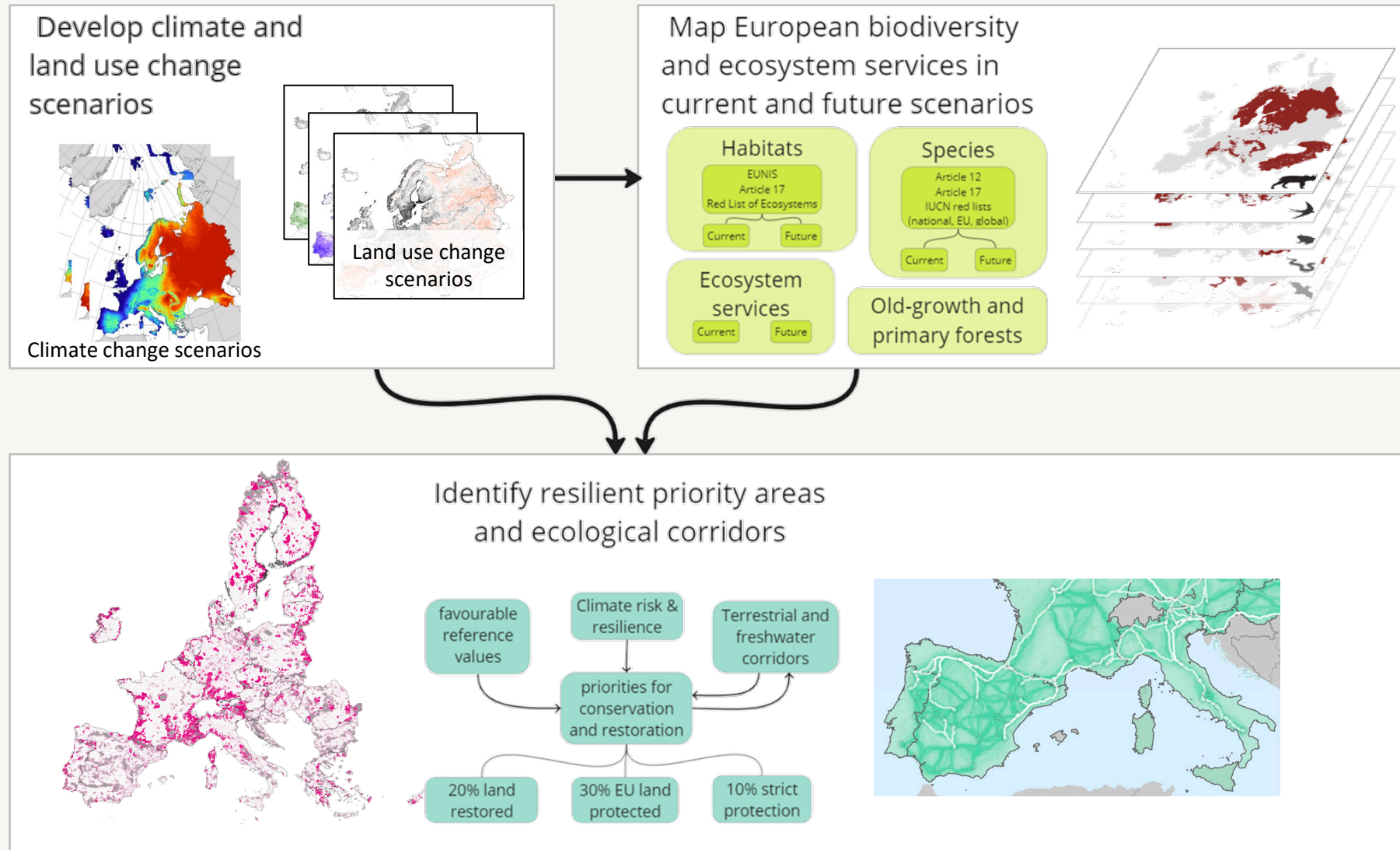


Which CDDA sites are critical for biodiversity?



Spatial overlap between CDDA sites and top priorities for Natura 2000 expansion sites

Designing a protected area network for nature and people



Where should the 10% strict protection be placed and what will be allowed and what not?

Strictly protected areas are fully and legally protected areas designated to conserve and/or restore the integrity of biodiversity-rich natural areas with their underlying ecological structure and supporting natural environmental processes. Natural processes are therefore left essentially undisturbed from human pressures and threats to the area's overall ecological structure and functioning, independently of whether those pressures and threats are located inside or outside the strictly protected area. [...] many strictly protected areas will be non-intervention areas, where only limited and well-controlled activities that either do not interfere with natural processes or enhance them will be allowed

[.....] In addition, strictly protected areas may also be areas in which active management sustains or enhances natural processes, such as semi-natural grasslands or some peatlands. In these cases, management activities should be limited to those necessary for the restoration and/or conservation of the habitats and species for whose protection the area has been designated. For example, mowing/grazing of grasslands would be considered compatible with strict protection if it is limited to the intensity needed for optimising the conservation value of the grasslands in question

How to identify priority areas for 10% for strict protection?

Where? 2 options:

- Only in existing protected areas (upgrading existing non-strict PA)
- Within the 30% areas identified (upgrading existing PA + can be outside of existing PA)

Where *not*:

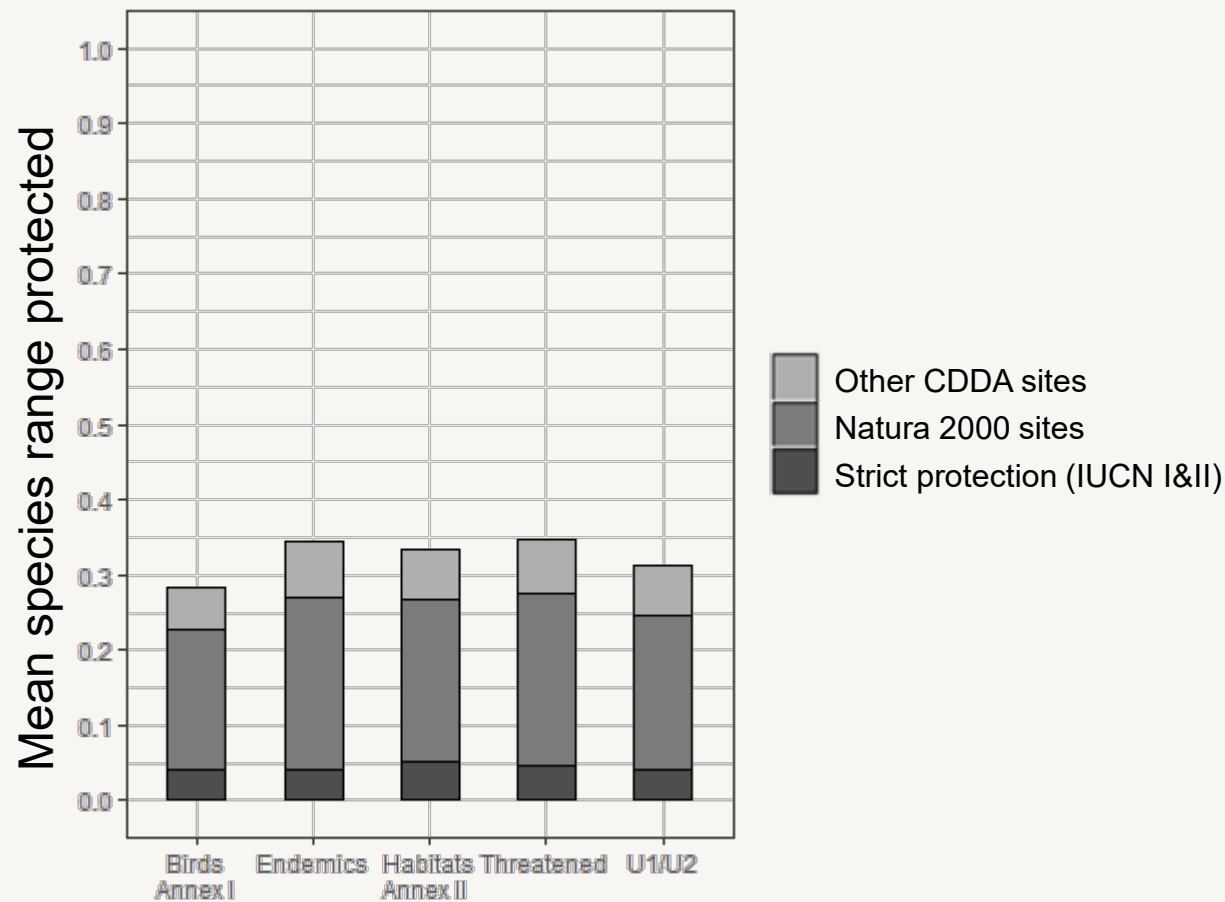
- Socio-economic costs
- No more than 10% strict protection per country (or biogeographic region?)

What for? 2 options:

- Sensitive species that would benefit from strict protection (need to identify which pressures are mitigated by strict management that are not mitigated by conventional protection)
- Include only threatened / UCS species (assumption that strict protection will prevent further decline / help recovery)

How much is currently protected?

European protected areas cover ~26% of EU land and protect ~30% species on average



Approach: Setting targets

how much of each feature's distribution (species, habitat) should we aim to protect?

Species: based on IUCN red list of species criteria and Jung et al., 2021

If species is threatened: $t_s = 100\%$ of distribution

Else: $t_s = \min(\max(2,200 \text{ km}^2, 0.8 R_s), 10^6)$

Habitats: based on IUCN red list of ecosystems criteria

If habitat is "threatened": $t_h = 100\%$ of distribution

Else: $t_h = \min(\max(5,000 \text{ km}^2, 0.7 R_h), 10^6)$

Approach: Setting weights

to set the relative importance of different features

Geographic rarity (to correct for feature splitting): $\frac{\text{local range}}{\text{Total Range}}$

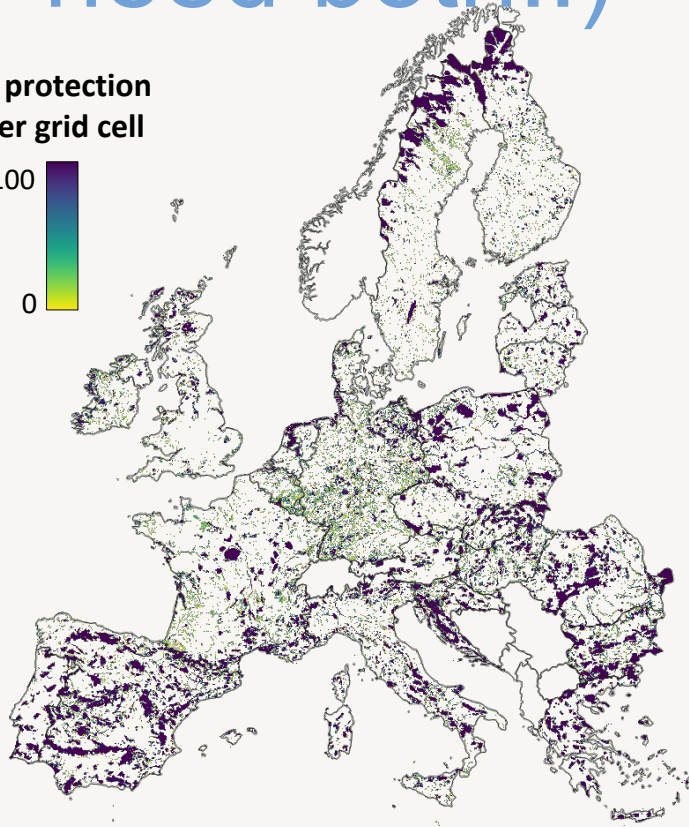
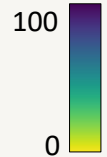
Red list status

CR: 8 > EN: 6 > VU: 4 > NT, DD: 2 > LC: 1 (then, compute average across EU, Global and National assessments)

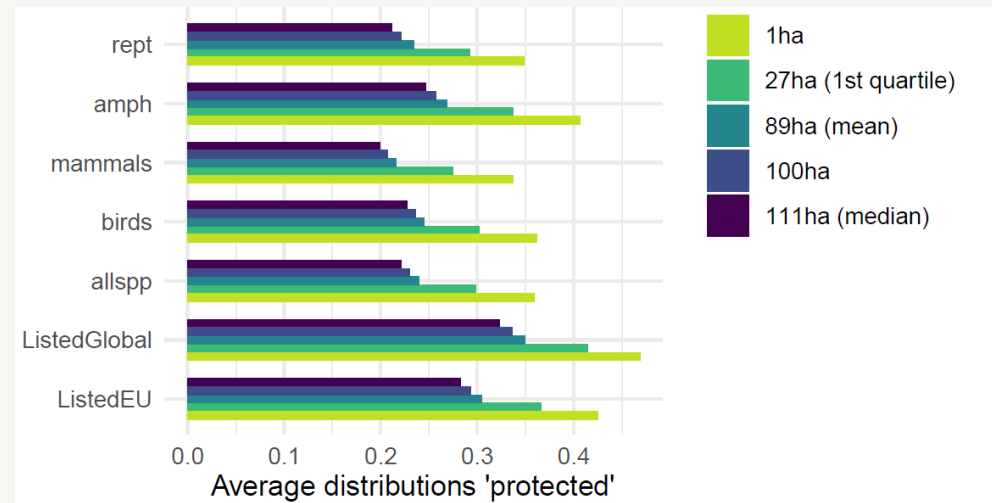
To combine both types of weights → multiplication.

Expand existing, or protect new areas? (we need both!!)

% protection per grid cell



N2K site size



Need to expand around small, valuable protected areas:

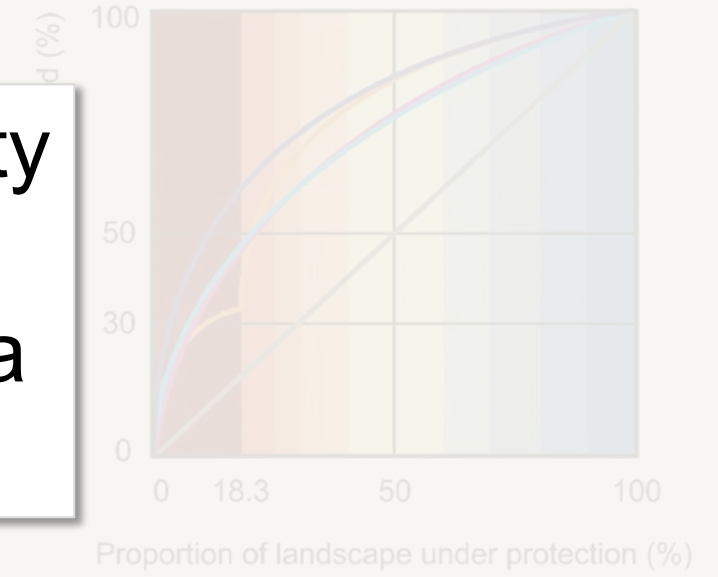
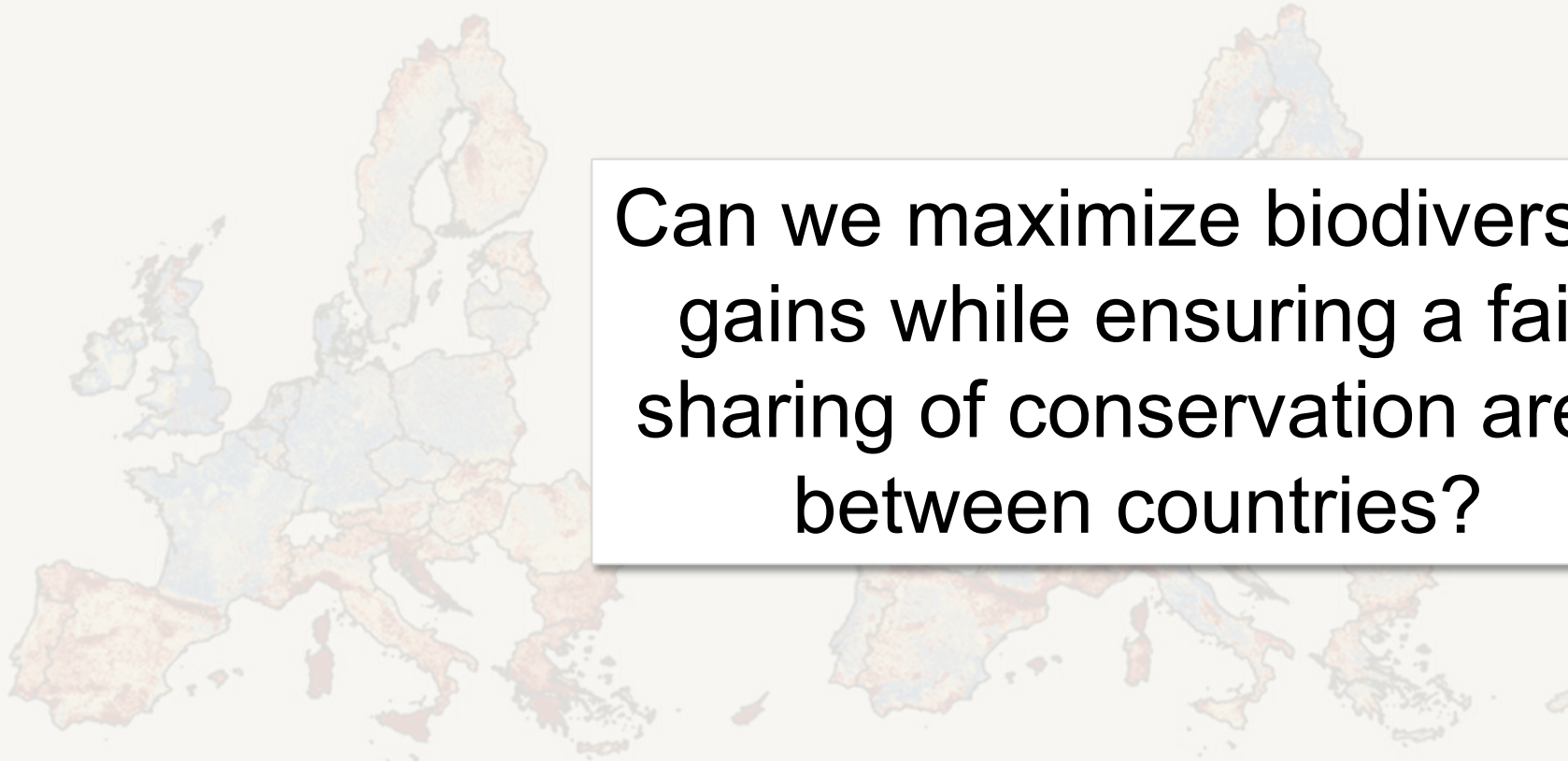
Many small N2K areas are in locations with a significant amount of EU biodiversity

→ important to expand around the small PA with high biodiversity value.

Still, ~60% of species distributions on average are **NOT** protected, so we also need to protect new areas.

What is the most cost-effective scale for planning?

Can we maximize biodiversity gains while ensuring a fair sharing of conservation area between countries?



EU-wide priorities

Member State priorities