

Selection of Important Herpetofauna Areas (IHAs) in Europe

How to accomodate climate change?

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Summary Plenary talk 6 – Promoting IHAs

- Why is it important to define IHA's?
- Step 1: **Which information is available?** Case study using information present in the Natura2000- Emerald sites network
- Step 2: Defining a **road map to move forward** with identification of IHAs
- Step 3: An approach to speed up attribution of species to protected areas
- Next steps: **what can you do?**
- General conclusions



Identifying IHA's: which aims?

- **Identify areas of significance for the conservation of reptiles and/or amphibians and the habitats upon which they rely.**
- Provide a transparent and reproducible approach to identifying IHAs.
- Raise awareness of reptile and amphibian species and their threats.
- The EU 2030 Biodiversity Strategy and post2020 Global Biodiversity Framework aim at protecting a minimum of 30% of the (EU's) land areas.



Step 1: Information availability

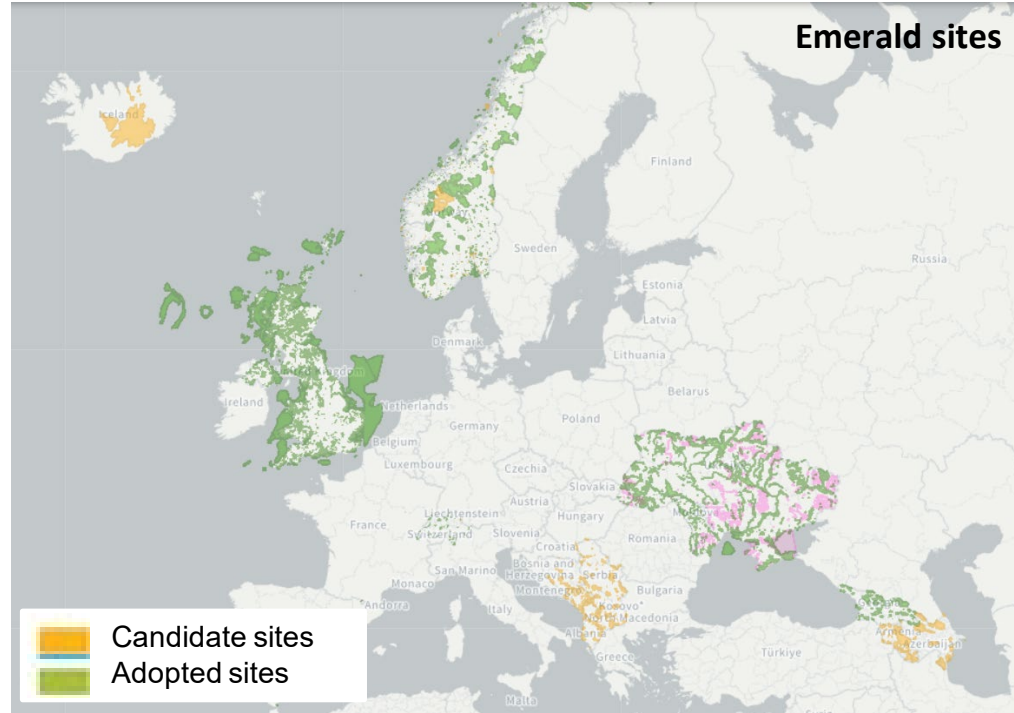
A case study using metadata and coverage of the
Natura2000 and Emerald site network



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Natura2000 & Emerald Sites



Maps courtesy of the Council of Europe (<http://emerald.eea.europa.eu/>) and the European Environment Agency (<https://www.eea.europa.eu/data-and-maps/figures/natura-2000-network-terrestrial-and>)

Case study: goals

- Focus on three main questions:
 1. **Which species are currently listed**, and **to what extent are these attributed to sites**? For example, not all countries attribute Annex 2 species to sites.
 2. Countries can choose to withhold information, for instance out of conservation concern - **which metadata is available**?
 3. Which are the **main challenges to overcome**?



Case study: approach

- Approach:
 1. Obtain and clean Natura2000 and Emerald metadata, 2023 versions.
 2. Process changes in taxonomy and nomenclature using the most recent European herpetofauna species list (2020).
 3. Compare Natura2000 and Emerald coverage with most recent European reptile and amphibian atlas (2014) to assess information availability.



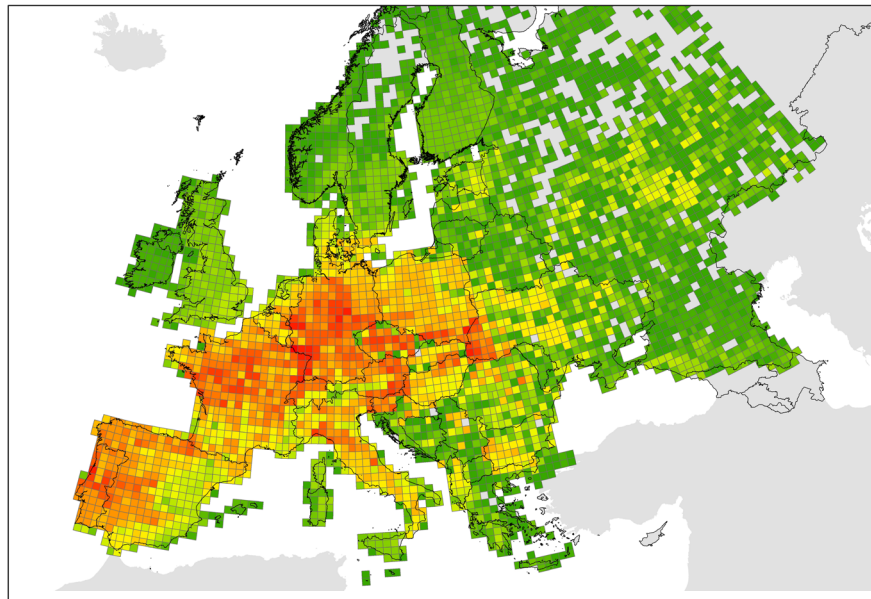
Case study: why clean up taxonomy?

- Species and subspecies get attributed to Natura2000 and Emerald sites throughout the years. These entries **do not get updated** once taxonomy or nomenclature change.
- Europe hosts **301** reptile and amphibian species*.
185 of these are N2000-listed (Emerald site reference list is under construction).
477 (!) reptile and amphibian species and subspecies names are present in N2000 and Emerald site metadata.
- Why? Outdated taxonomy (and typos).

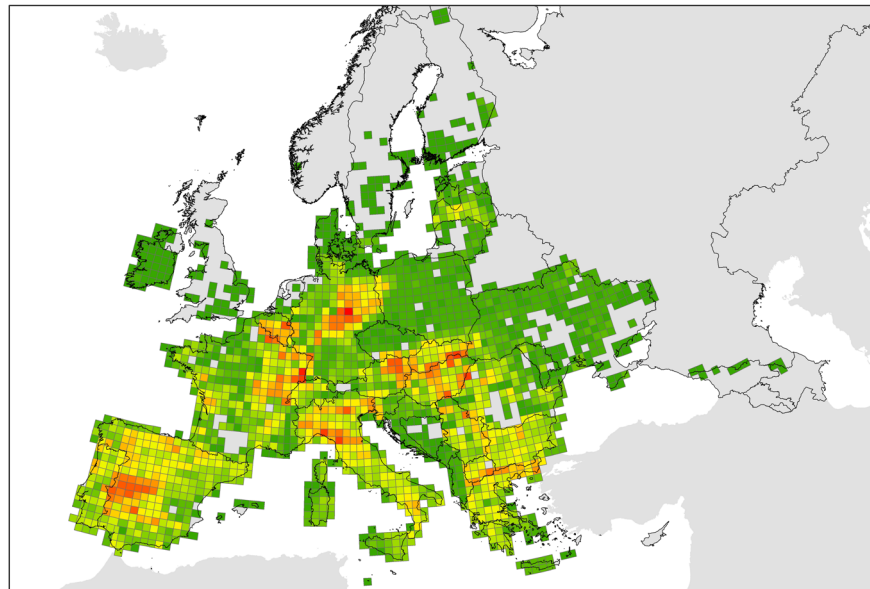


Case study: results amphibians

- Results displayed on a 50x50km grid.
- Warmer colors mean more species (ranging from 1 to 18).



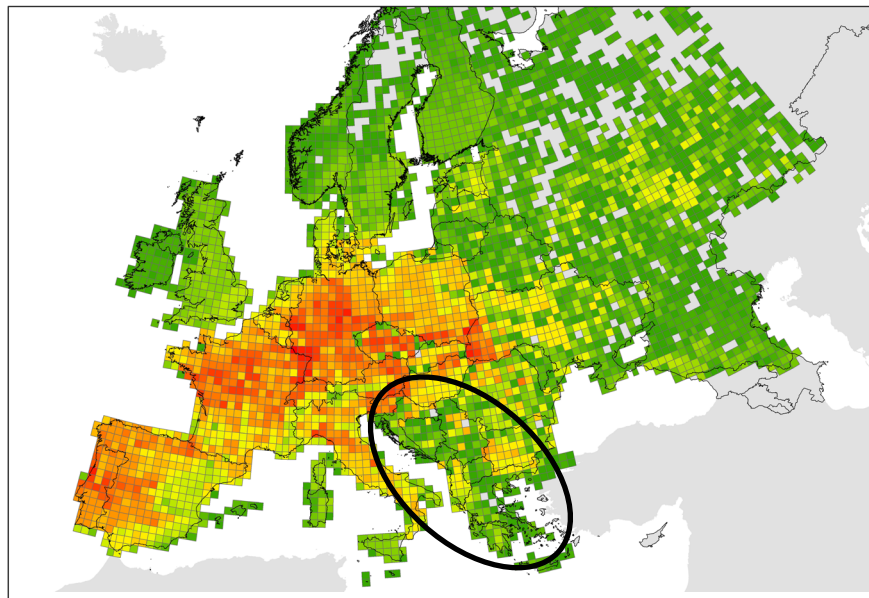
European atlas data (2014); 64 listed species (complexes)



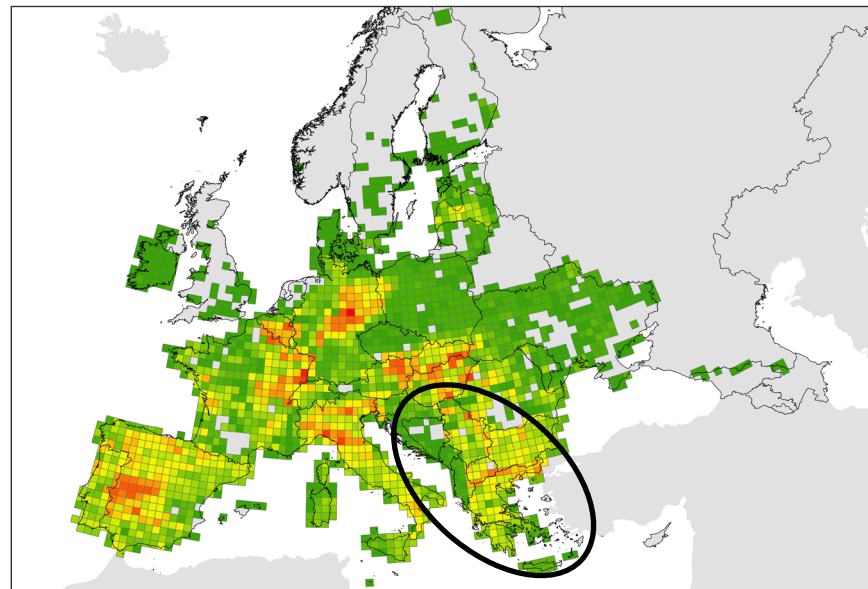
N2000 & Emerald metadata (2023); 81 listed (sub)species

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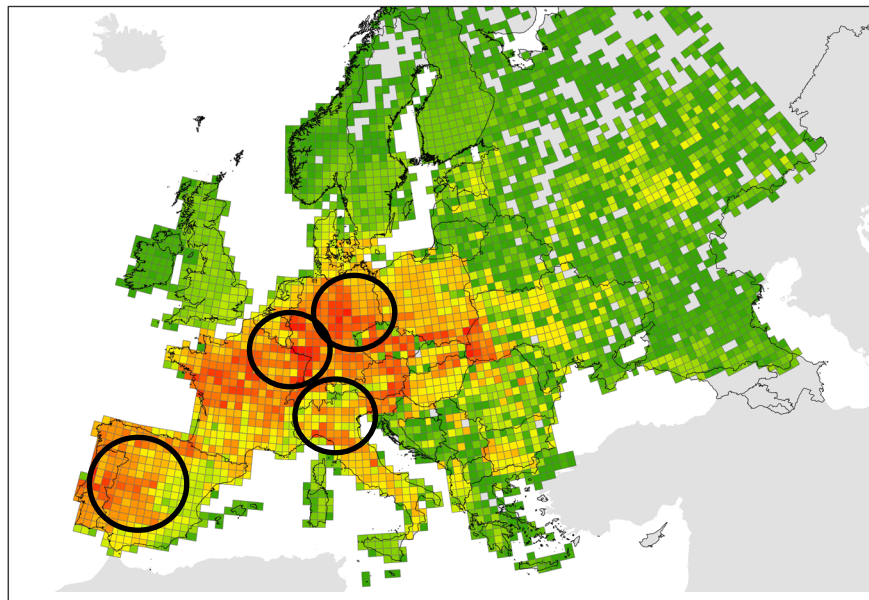
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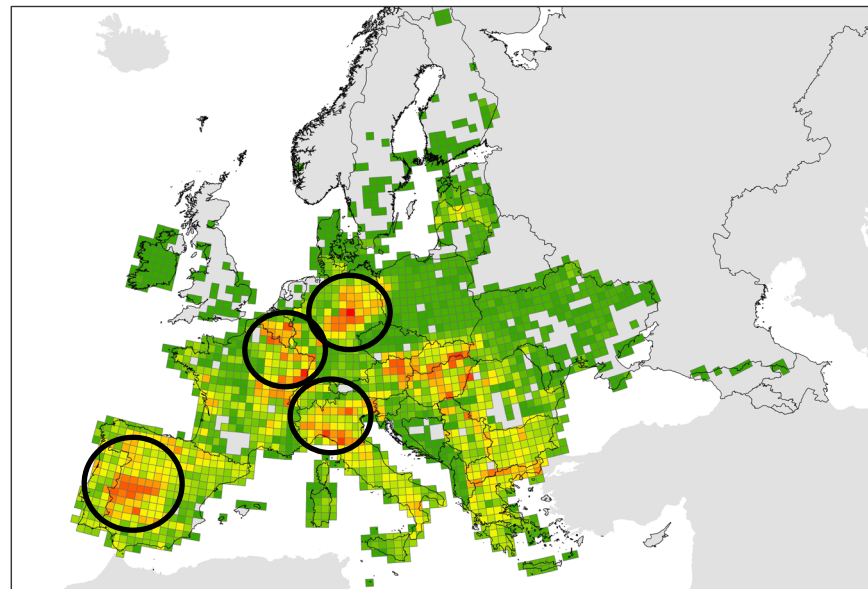
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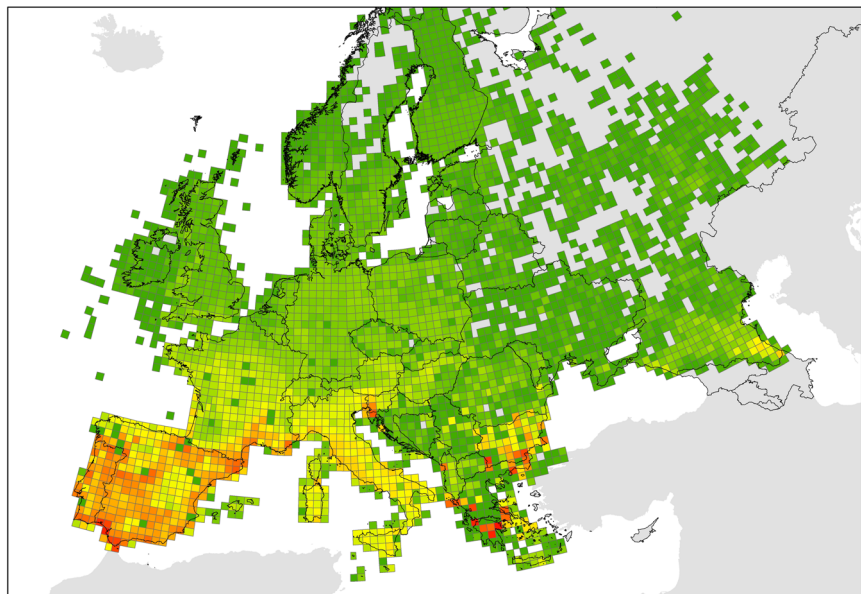
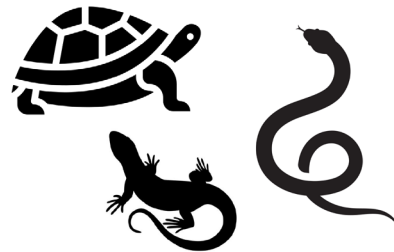
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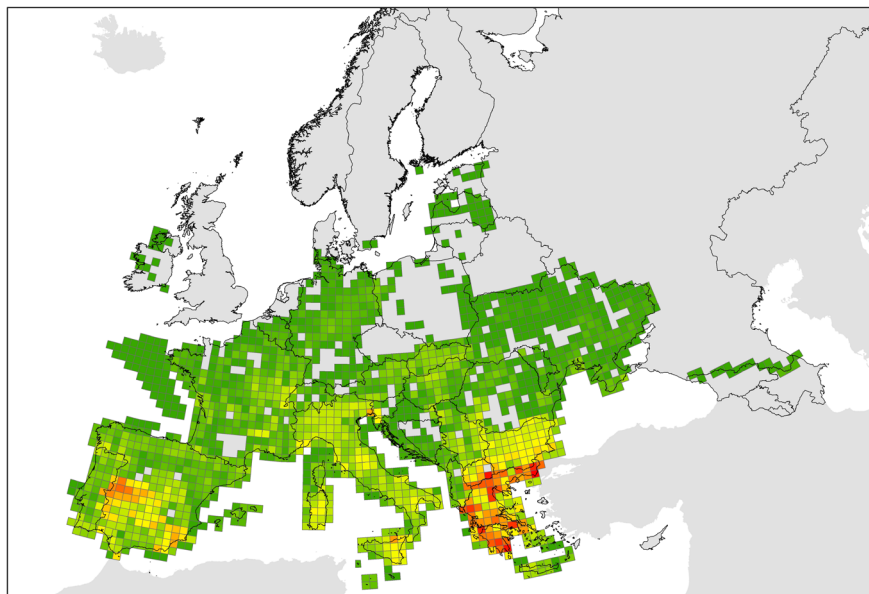
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Case study: results reptiles

- Results displayed on a 50x50km grid.
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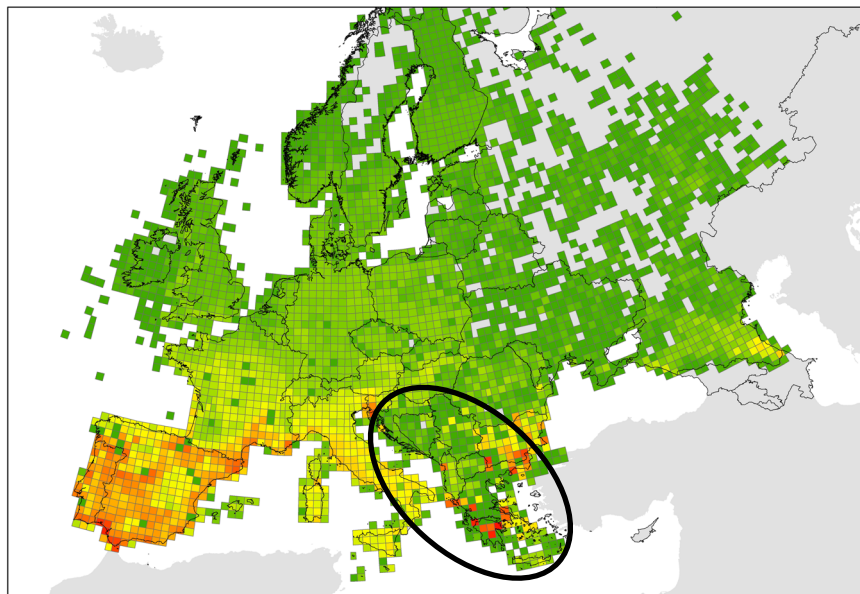
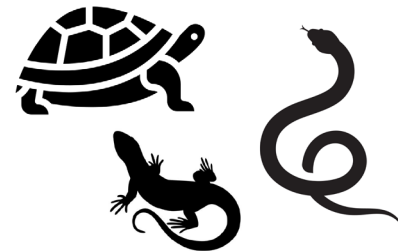
European atlas data (2014); 110 listed species (complexes)



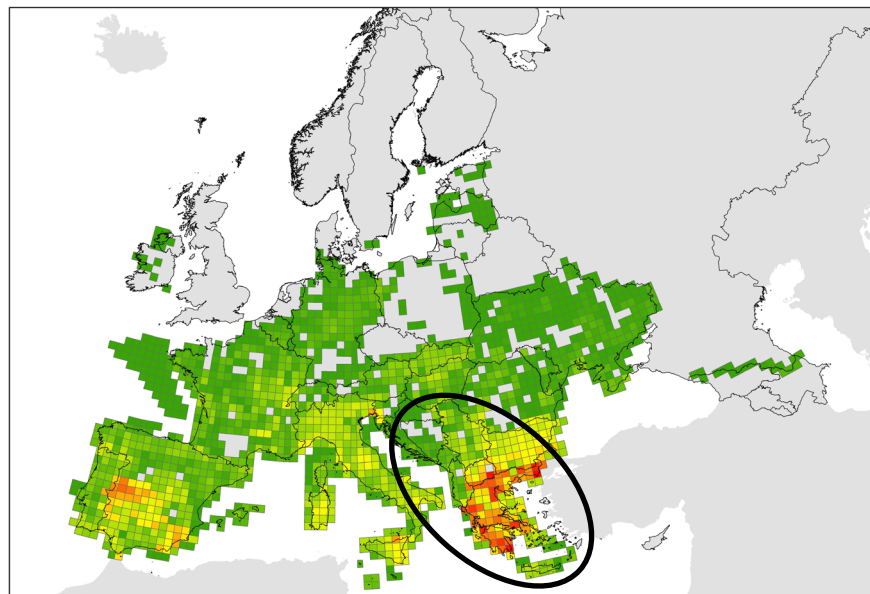
N2000 & Emerald metadata (2023); 119 listed (sub)species

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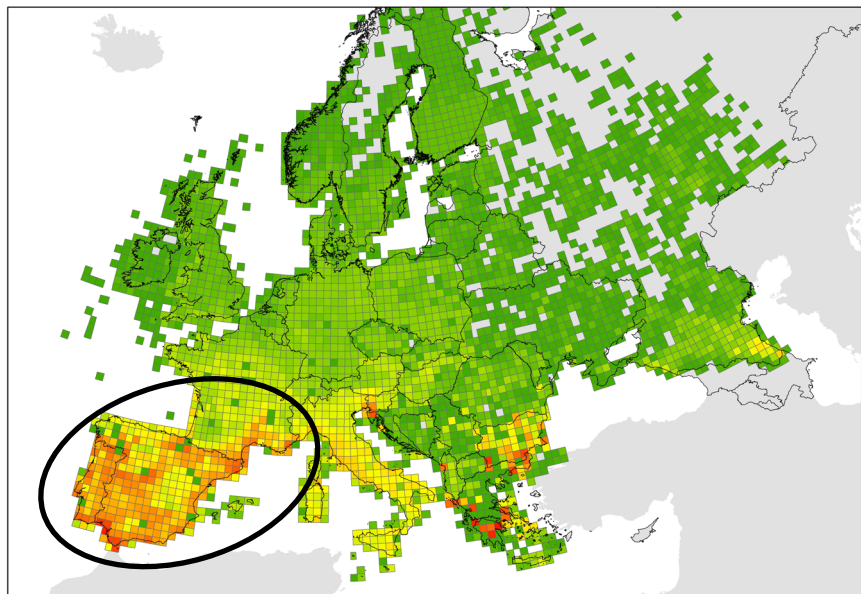
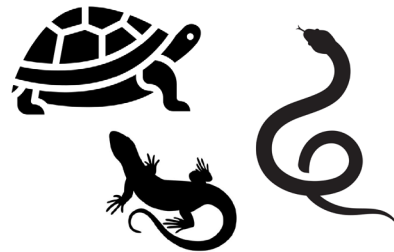
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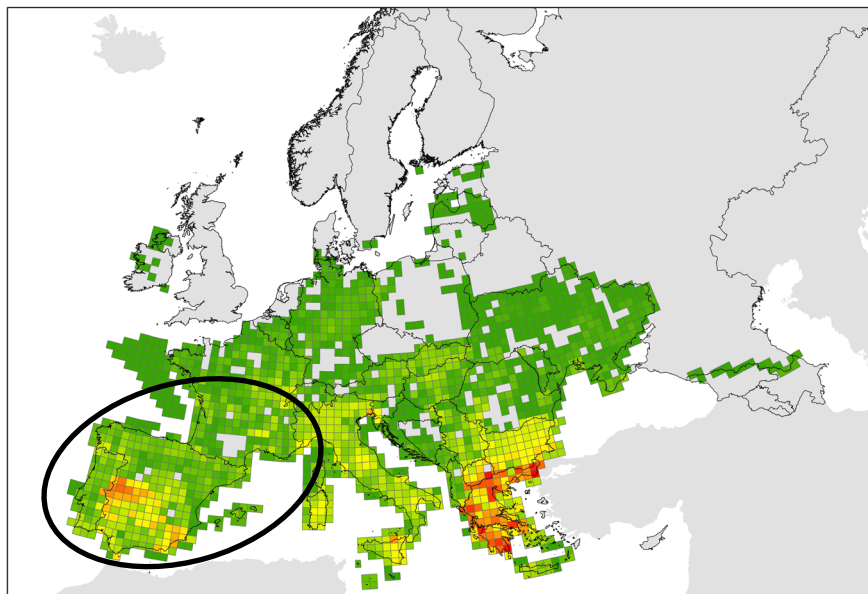
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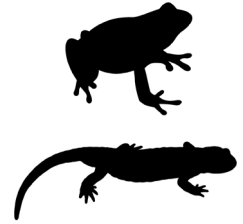
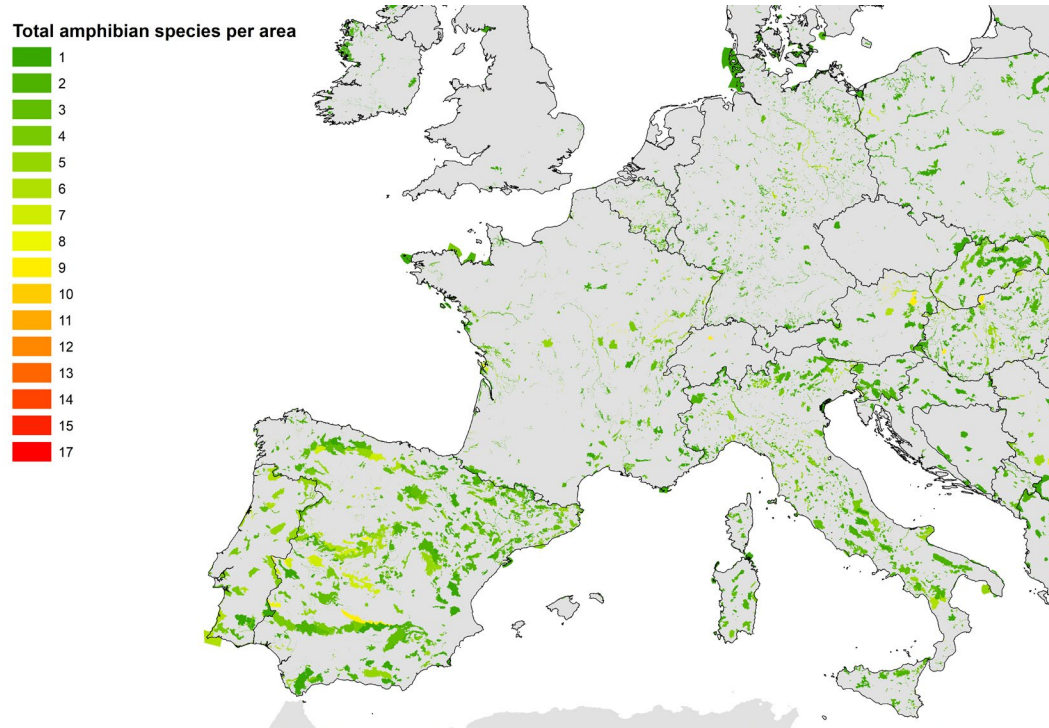
Discussion: compare the maps yourself!

- The analysis brought forward that there are gaps between the actual Natura 2000 and Emerald sites in which listed herpetofauna species are attributed to and hotspots of Herpetofauna according to atlasdata.
- Species richness of Amphibians and particularly Reptiles in Spain and Portugal is underestimated in N2000-Emerald site data. Do you agree?
- Can the IHA approach help countries/Member States to reconsider designation of areas? (e.g. adjust boundaries or designate new sites)



A relatively small number of species is attributed

Statement: Listed species should be consistently attributed to existing N2000/ Emerald sites!



- Remember; the 2014 atlas data is only available at 50x50km grid, but the N2000-Emerald metadata is available per area;

Case study: conclusions

- When filtered and cleaned, N2000 and Emerald site herpetofauna occurrences form a **basis for IHA identification**.
- Yet, Annex II amphibian and reptiles are not consistently attributed to sites. Occurrence of non-listed species is not recorded in the N2000 and Emerald site metadata. **Gaps on the map remain.**
- Current European herpetofauna atlasdata is at 50x50km too coarse to be a solution. A new 10x10km atlas is in the making, but may also be too coarse to link species presence to (small) protected sites.

- **How to proceed?**



Step 2: defining a road map to move forward with identification of IHAs



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Defining a road map

We propose the following lines of action:

1. **Use Natura 2000 and Emerald sites as a basis**, as was done for Important Bird Areas and Prime Butterfly Areas.
2. **Thoroughly revise metadata** of established Natura 2000 and Emerald sites.
3. **Adopt the Key Biodiversity Areas (KBA)** approach to identify initial IHAs. Take a national-level approach.
4. Use **other distribution data sources** (e.g. citizen scientist observations) to speed-up attribution of species to sites



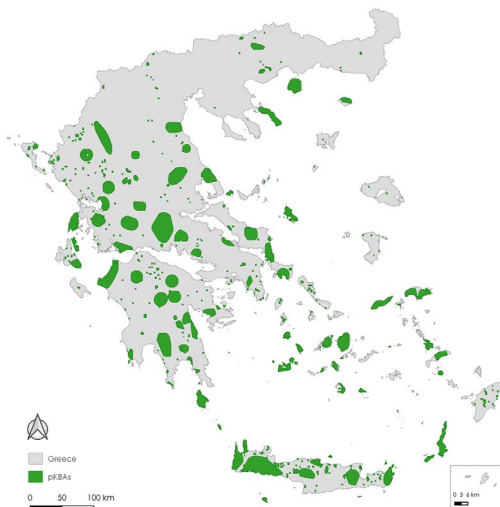
The KBA Approach

- The Key Biodiversity Areas (KBA) approach aims to identify, map and promote the conservation of the most important places for nature across the globe.
- KBA's are selected using various criteria, for instance on species threat status, assemblages of species and irreplaceability.
- **Identifying and proposing KBAs is aimed to be a nationally driven process.** Anyone with appropriate scientific data may propose a site, and consultation with stakeholders at the national level (both non-governmental and governmental organizations) is an essential part of the process.
- KBAs extend the Important Bird Area (IBA) concept, and lie at the basis of Prime Butterfly Areas.



KBA approach example: Greece

- Example; Greece. (bases on PhD thesis Konstantina Spiliopoulou)
- Greece has become the first European country to recognize KBA's in its laws and policies.
- In part based on reptile- and amphibian occurrence data.



KBA approach example: UK

- ARC Trust is developing an approach to define IHA's for the UK based on the KBA principles.
- A high geographic resolution of data is available, permitting ARC Trust to identify sites at 10 x 10 km scale (hectad).
- They used more 'flexible' criteria to a certain degree:
 - A1 – Grids containing any Critically Endangered species at the national level
 - A2 – Grids containing any threatened (EN, VU) species at the national level
 - B1 – Grids containing in the top 10% of species diversity for each country (England, Scotland, Wales). For example, for England, this was any grids with 8 or more reptile and amphibian species recorded within it.



KBA approach example: UK

	IUCN red list						Bern	Hab. Dir. (Ann. II or IVa)	Hab. Regs. 2010	Wildlife and Country-side Act (1981)	The Wildlife (NI) Order 1985
	Global ^a	European ^b	GB ^c	England ^c	Wales ^c	Scotland ^c					
<i>Bufo bufo</i>	LC	LC	NT	NT	LC	NT	A3			Sch5: 9.5a	
<i>Epidalea calamita</i>	LC	LC	EN	EN	EN	EN	A2	A4	Sch2	Sch5: 9.4b, 9.5a, 9.4c	
<i>Pelophylax lessonae</i>	LC	LC	CR	CR	NA	NA	A3	A4	Sch2	Sch5: 9.4b, 9.4c	
<i>Rana temporaria</i>	LC	LC	LC	LC	LC	LC	A3	A5		Sch5: 9.5a	
<i>Lissotriton helveticus</i>	LC	LC	LC	LC	LC	LC	A3			Sch5: 9.5a	
<i>Lissotriton vulgaris</i>	LC	LC	LC	LC	LC	LC	A3			Sch5: 9.5a	Sch5
<i>Triturus cristatus</i>	LC	LC	LC	LC	LC	LC	A2	A2*, A4	Sch2	Sch5: 9.4b, 9.5a, 9.4c	
<i>Anguis fragilis</i>	LC	LC	LC	LC	LC	LC	A3			Sch5: 9.1, 9.5a	
<i>Lacerta agilis</i>	LC	LC	EN	EN	VU	NA	A2	A4	Sch2	Sch5: 9.4b, 9.5a, 9.4c	
<i>Zootoca vivipara</i>	LC	LC	LC	LC	LC	LC	A3			Sch5: 9.1, 9.5a	Sch5
<i>Coronella austriaca</i>	LC	LC	EN	EN	NA	NA	A2	A4	Sch2	Sch5: 9.4b, 9.5a, 9.4c	
<i>Natrix helvetica</i>	LC	LC	LC	LC	LC	NA	A3			Sch5: 9.1, 9.5a	
<i>Vipera berus</i>	LC	LC	NT	VU	NT	NT	A3			Sch5: 9.1, 9.5a	

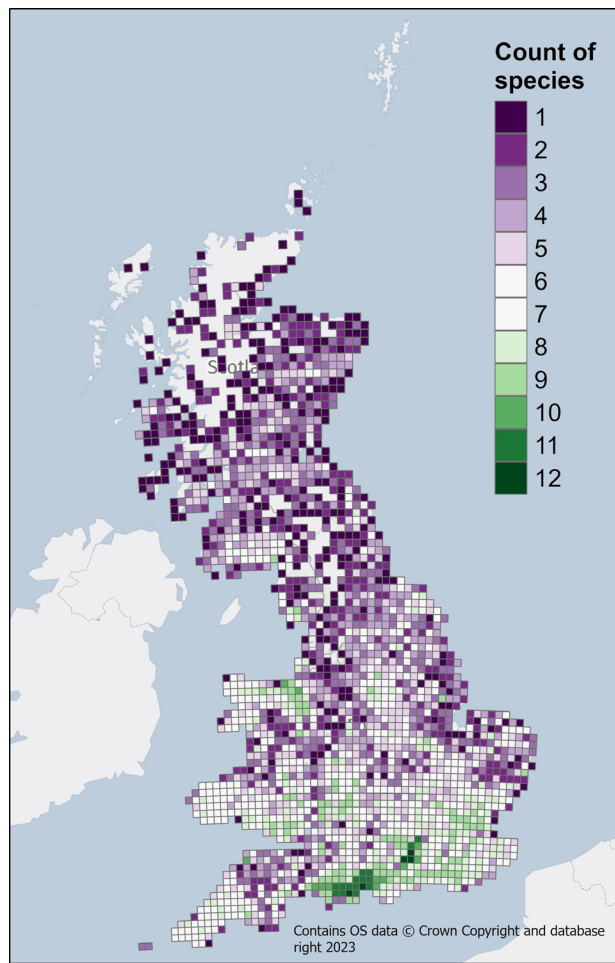
Which species
should trigger
criteria?

Foster, J. et al. (2021). IUCN Red List assessment of amphibians and reptiles at Great Britain and country scale. Report to Natural England. ARC report. ARC, Bournemouth.

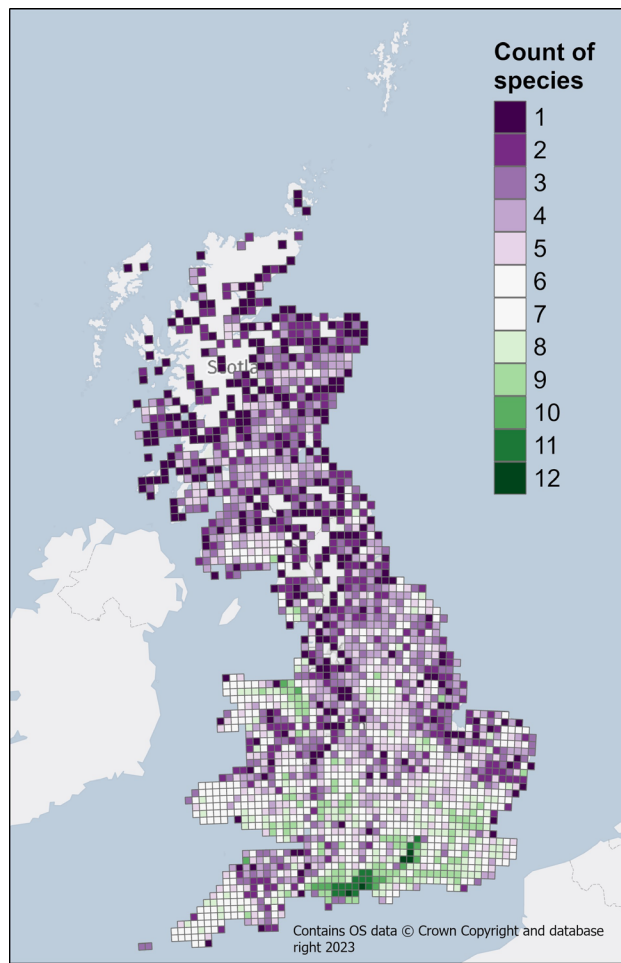


KBA approach example: UK

The attached image (*Criteria B1_scores*) shows the number of species per 10km grid across Britain.
(preliminary map, Rob Ward, ARC Trust):



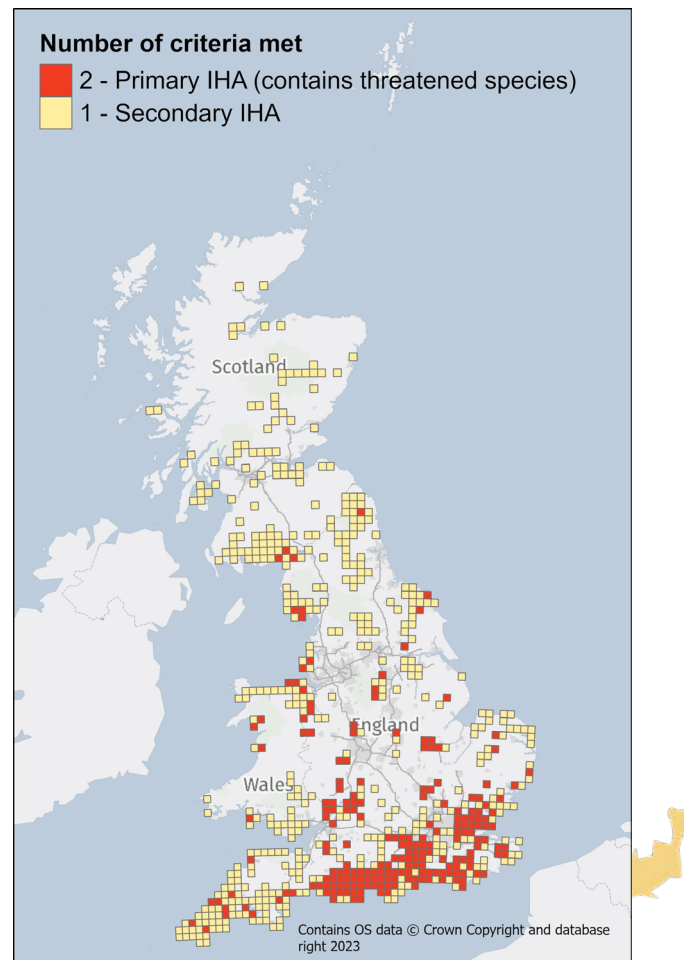
Preliminary selection of IHAs in the UK



Left: number of species per 10 x 10km grid

Right: Primary and secondary IHAs after using the selection criteria

Copyright maps, Rob Ward (ARC Trust)



Discussion

- Discussion:
 - 1) Would it be useful for your country to do the same exercise as they did for the UK to find out where primary and secondary IHAs could be?
 - 2) Or: is the Greece approach selecting KBAs of multispecies groups preferable?



Discussion: How to accomodate Climate change?

- Statement: Selection of IHAs (N2000/Emerald sites) must be resilient for climate change, but how?
- Any ideas?

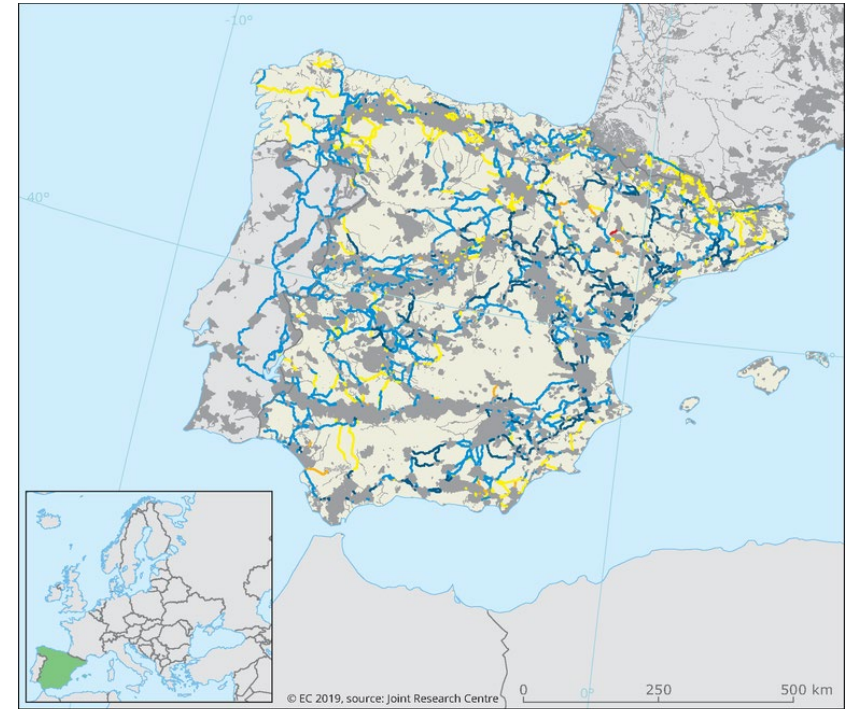


Climate change and Protected Areas

- Statement: Selection of IHAs (N2000/Emerald sites) must be resilient for climate change, but how?

Any ideas?

- Are corridors a solution?



Assessment of the delivery of multiple ecosystem services in the corridors between Natura 2000 sites of Spain

Number of ecosystem services above the average service delivery outside Natura 2000

0 1 2 3 4 Natura 2000

Key messages

- N2000 and Emerald site herpetofauna occurrences form a **basis for IHA identification**, but **gaps on the map remain**.
- We propose to **thoroughly revise Natura 2000 and Emerald metadata**, and to **adopt the Key Biodiversity Areas (KBA)** approach to identify initial IHAs.
- IHA identification should take place at national level, and weighed/compiled at European level.
- **Other sources of distribution data**, such as citizen scientist observations, should be used to speed-up attribution/detection of species to protected area network.
- In parallel, a Species Distribution Modelling approach can be used to assess potential importance of 'blank spaces' on the map. **SDMs can guide iterative improvement of the IHA network**.



Thank you for your attention!

Questions?



We thank Bruno Combal, Marc Hory, Marc Roekaerts, Frank Vassen, and Nick Warmelink, who facilitated our analyses.

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