

Natura2000 – representation gaps



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Overview

Aim

- Evaluate Conservation status and find potentials for improvement of the Natura2000 network

Status Natura 2000 network

- Gap analysis

Representativeness of species in N2k

- Benefit per country
- Representativeness of species groups

Conclusions

- Prioritizing future conservation effort



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Protecting biodiversity

- IV World Park congress (Caracas 1992) : “setting aside 10% of land surface”
- European Council (Gothenburg 2001): “that biodiversity decline should be halted with the aim of reaching this objective by 2010“

Annex II species list of the Habitat Directive

	EU27 (2007)	
Amphibians	25	0,03
Fish	79	0,09
Invertebrat	136	0,15
Mammals	54	0,06
Plants	587	0,65
Reptiles	24	0,03
Total	905	100 %

Number of species per species group



agreed list of species to be protected



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Sites of the Natura 2000 network (EU27, 2007)



EuMon – EU-wide habitats of Community interest – **EuMon Conference: 28.-30. January 2008**



Sites of the Natura 2000 network (EU27, 2007)

- European Environmental Agency
- Natura 2000 EUNIS database
- <http://dataservice.eea.europa.eu/dataservice/metadetails.asp?id=774>

MS	Total Number	Total Area (km ²)	Terrestrial Area (km ²)	% Terrestrial (1)
AT	166	8 888	8 888	10.6
BE	280	3 241	3 041	10.0
	180	14 882	14 758	13.3
CY ⁽²⁾	36	711	661	11.5
CZ	864	7 244	7 244	9.2
DE	4617	53 294	35 208	9.9
DK	254	11 136	3 177	7.4
EE	497	11 328	7 474	16.5
ES	1430	123 382	118 165	23.4
FI	1715	48 552	43 092	12.7
FR	1335	52 156	46 564	8.5
GR	239	27 641	21 643	16.4
HU	467	13 929	13 929	15.0
IE	413	10 561	7 175	10.2
IT	2281	45 059	42 816	14.2
LT	267	6 664	6 493	9.9
LU	48	399	399	15.4
LV	331	7 663	7 101	11.0
MT	27	48	40	12.6
NL	141	7 510	3 485	8.4
PL	294	23 256	23 256	7.4
PT	94	16 503	16 013	17.4
	273	32 833	31 479	13.2
SE	3971	62 782	56 934	13.7
SI	259	6 360	6 359	31.4
SK	382	5 739	5 739	11.8
UK	613	25 109	15 976	6.5
EU	21 474	626 870	547 111	12.8

- 2007
- 10% target reached
- more than 21000 sites in the network (2007)

list of sites for protecting species

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Gap analysis

(combine list of species with list of sites)

Are all species represented at least once in the network ?

- if representation is zero -> gap species

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Global map of gap species (Rodriguez et al. 2004)



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Gap analysis

(combine list of species with list of sites)

Are all species represented at least once in the network ?

✦ if representation is zero -> gap species

↖ 44 of 905 species (~5%) are gap species

But is a single representation enough???



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Multiple representation: ten fold representation

$$p_0^{sites} > er$$

p_0 : risk of extinction per site per hundred years (50%)
 er : extinction risk per species per hundred years (0.1%)
 $sites$: number of sites

$$0.5^{sites} > 0.001 \implies sites > 9.96 \approx 10$$

at least 10 sites per species are required to achieve a chance below 1 out of 1000 of extinction in a hundred years

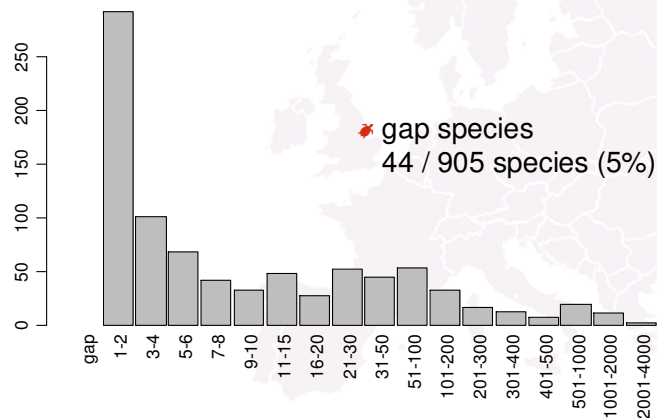


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EU-wide representativeness of annex species (2004)

EU-wide representativeness

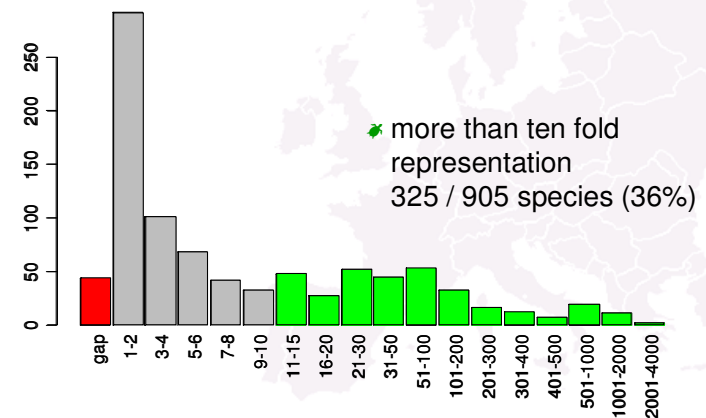


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EU-wide representativeness of annex species (2004)

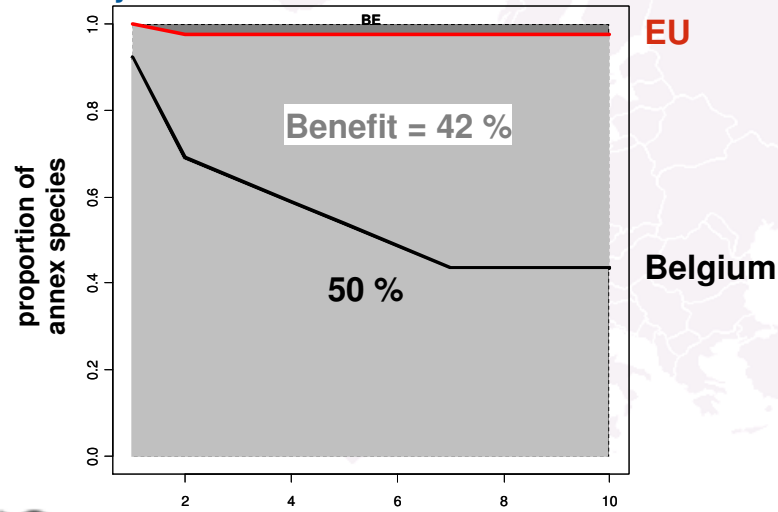
EU-wide representativeness



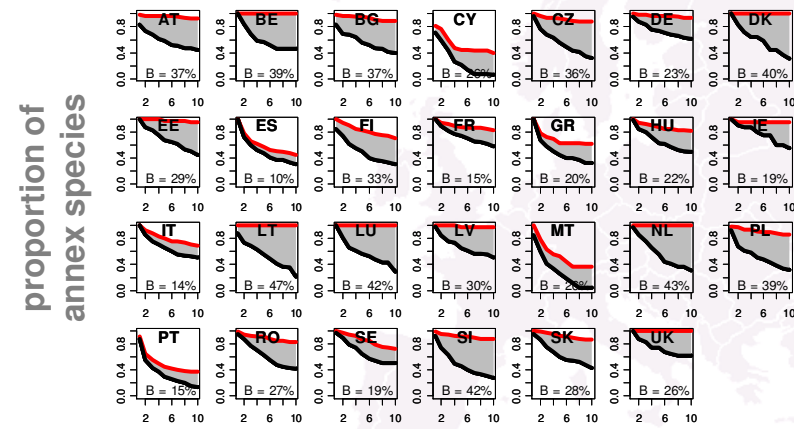
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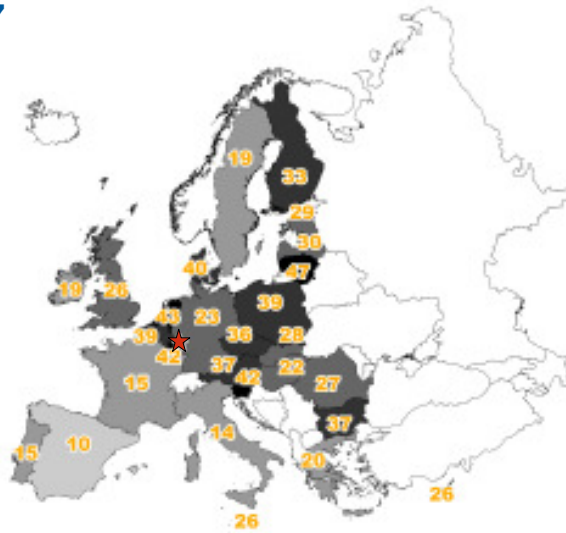
benefit = % increase in representativeness in relation to a 10 fold representation of annex species known to occur in a country



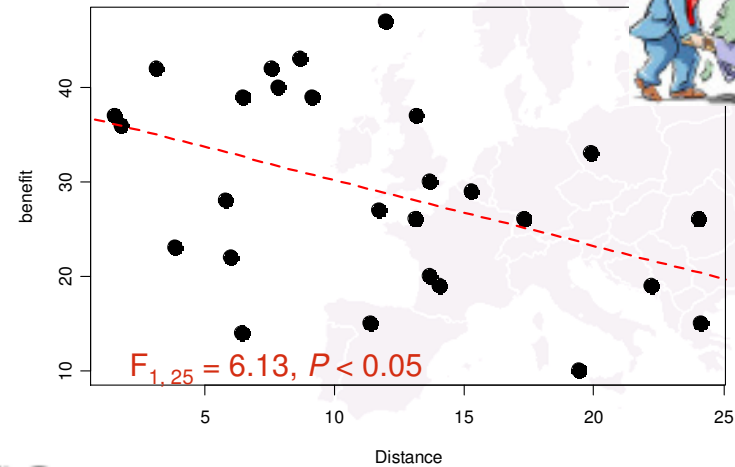
Benefit by country (EU15, 2004)



Benefit in EU27

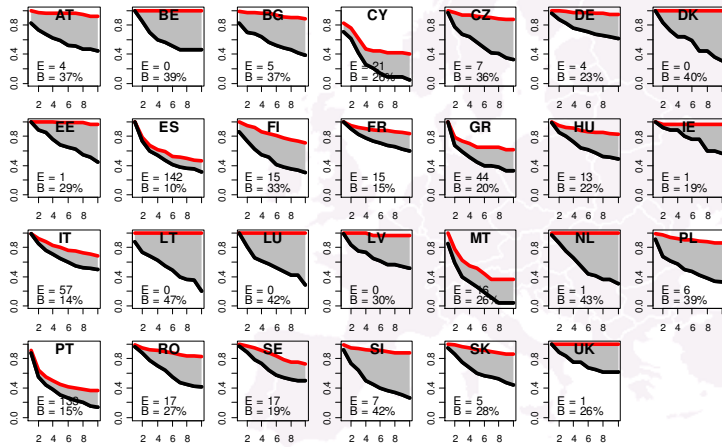


Benefit against distance from the center of Europe (Brussels)



Benefit by country EU27

proportion of annex species



representativeness



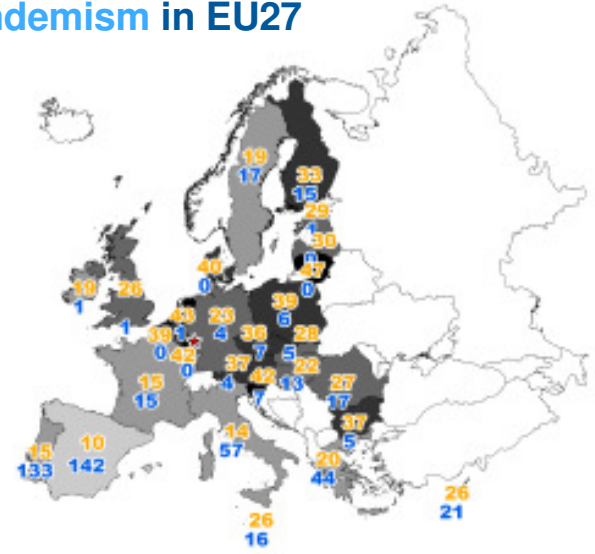
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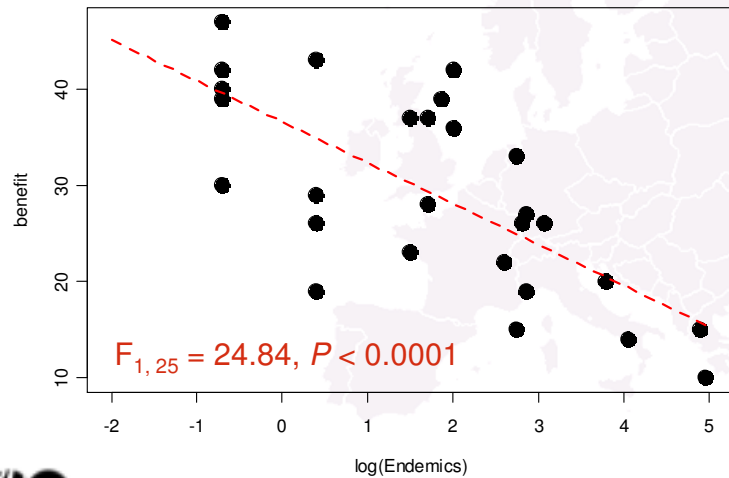
Benefit and endemism in EU27



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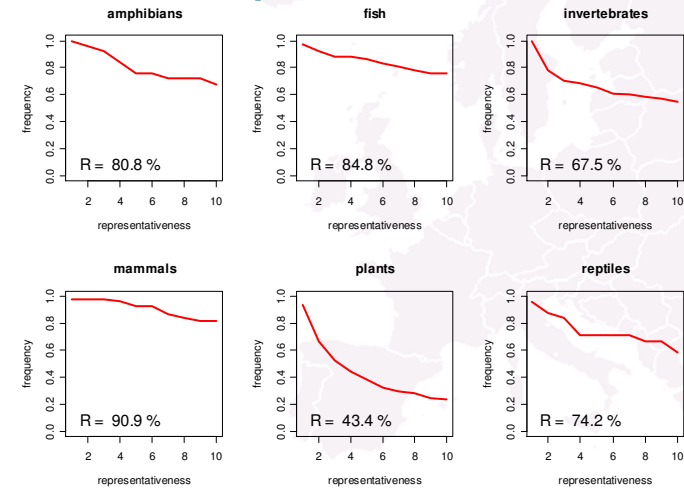
Benefit against endemism



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Representativeness by species group (% of tenfold representation achieved)



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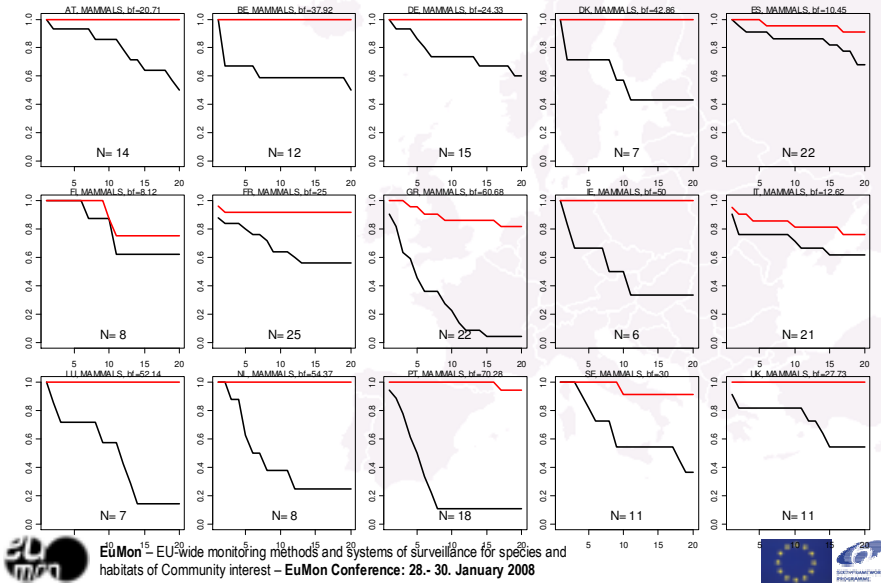


Summary

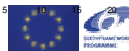
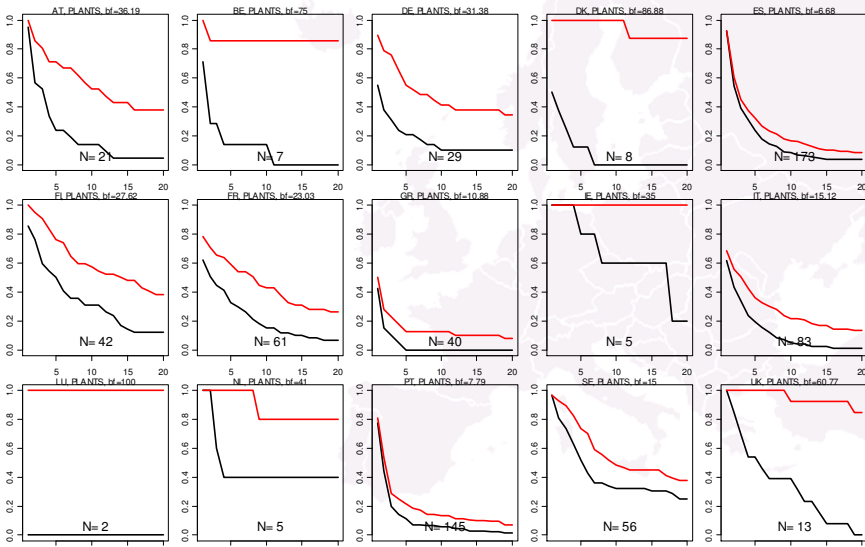
- representativeness in the EU network is very skewed
- countries with high number of endemics (geographically marginal located) should be prioritized in future conservation actions
- efforts should be increased for invertebrates and plants
- instead of using number of representations, extinction risks should be used [if data are available]



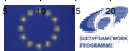
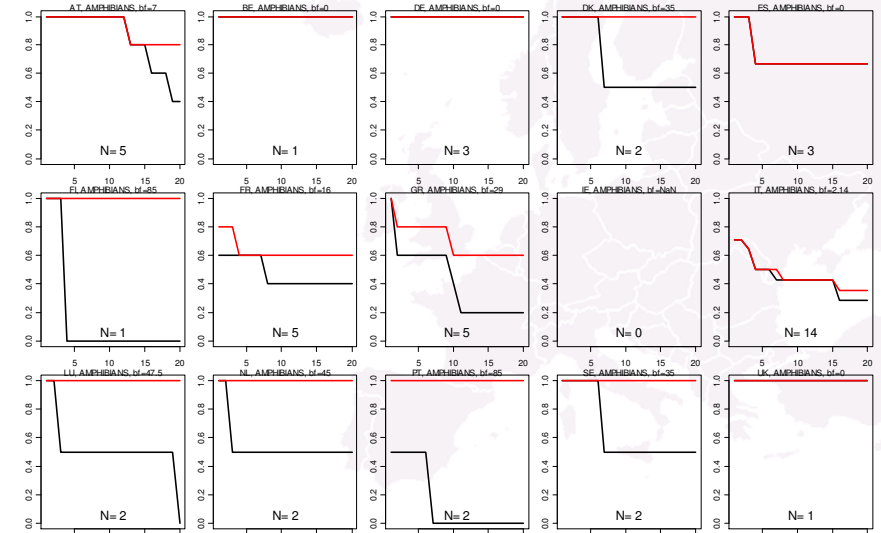
benefit by species group and country (mammals)



benefit by species group and country (plants)



benefit by species group and country (amphibians)

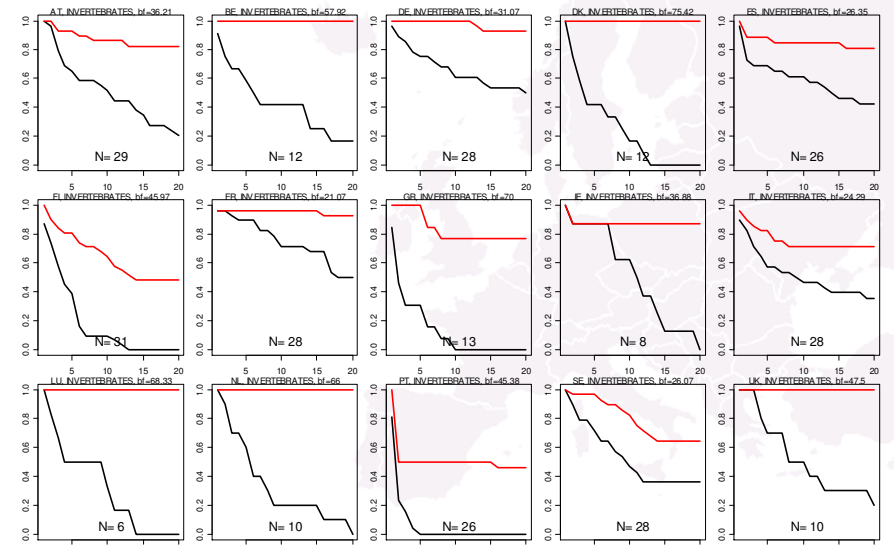


Habitat Directive (Annex II species list)

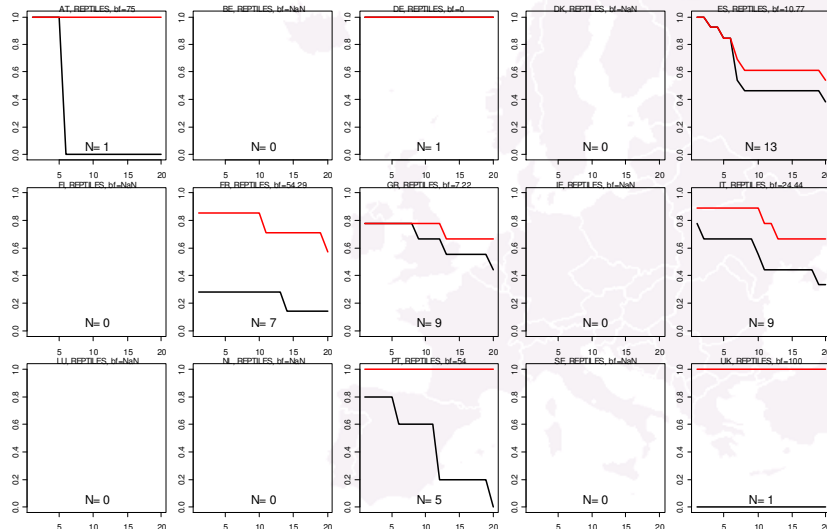
	described species (IUCN 2006)	EU27 (2007)	EU15 (2004)
Mammals	5,416 (0.35 %)	54 (5.93 %)	41 (5.76 %)
Reptiles	8,240 (0.54 %)	24 (2.63 %)	21 (2.95 %)
Amphibians	5,918 (0.39 %)	25 (2.74 %)	23 (3.23 %)
Fish	29,300 (1.92 %)	85 (9.33 %)	65 (9.13 %)
Invertebrates	1,190,200 (77.96 %)	136 (14.93 %)	79 (11.1 %)
Plants	287,655 (18.84 %)	587 (64.43 %)	483 (67.84 %)
Total	1,526,729 (100 %)	911 (100 %)	712 (100 %)

Number of species per species group

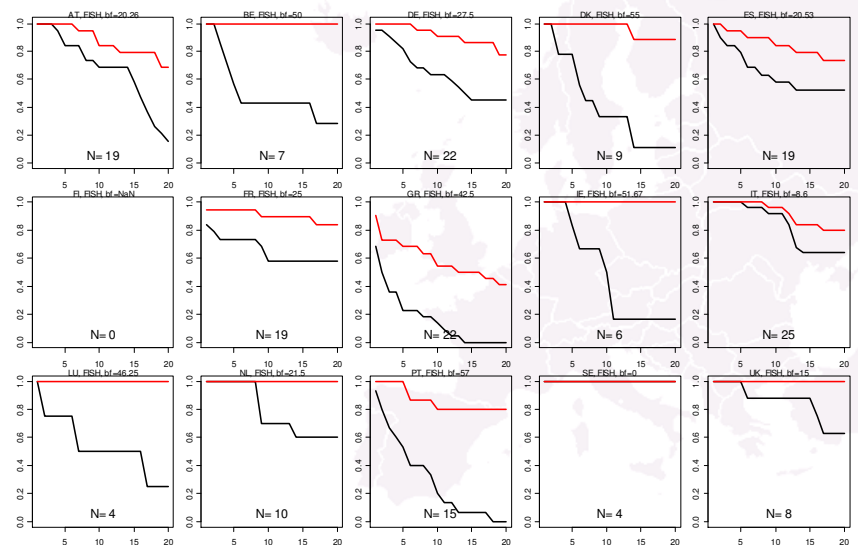
benefit by species group and country (invertebrates)



benefit by species group and country (reptiles)



benefit by species group and country (fish)



Global map of gap species (Rodriguez et al. 2004)



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Protecting biodiversity by reserves

- ✦ most efficient
- ✦ 10% target has been set
- ✦ Europe has reached the 10% target by implementing Natura2000 network
- ✦ evaluation of network by looking at representativeness
- ✦ how often species are protected (represented) in the network
- ✦ gap analysis



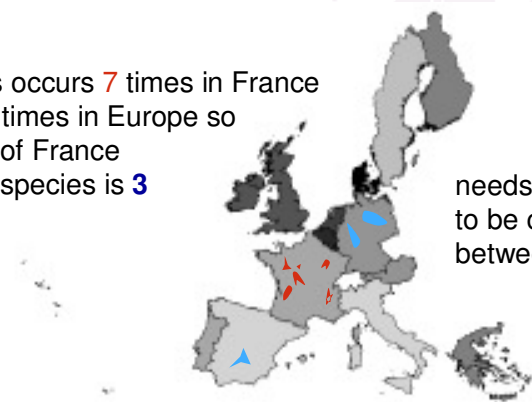
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Benefit

benefit shows the increase in representativeness for each country if complete N2K network is taken into account

species occurs 7 times in France and 10 times in Europe so benefit of France for this species is 3



needs to be standardized to be comparable between countries



habitat of Community interest – EuMon Conference: 28.- 30. January 2008



How many sites are needed?

- ✦ if there are 712 annex species,
- ✦ and we want to achieve a tenfold representation,
- ✦ – assuming at least one annex species per site –
- ✦ we need $712 * 10 = 7120$ sites
- ✦ but there are already more than 18000 sites in the N2k network



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