

Habitat monitoring in Europe: costs and methods

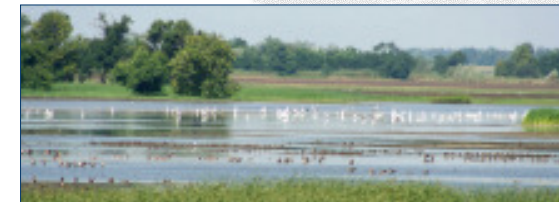
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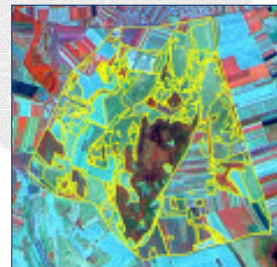
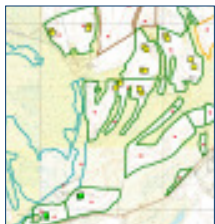
Aims of talk

- demonstrate main approaches and important methods used in current habitat monitoring
- illustrate costs, study if money is well spent
- show how systematic evaluation can help increase cost-effectiveness



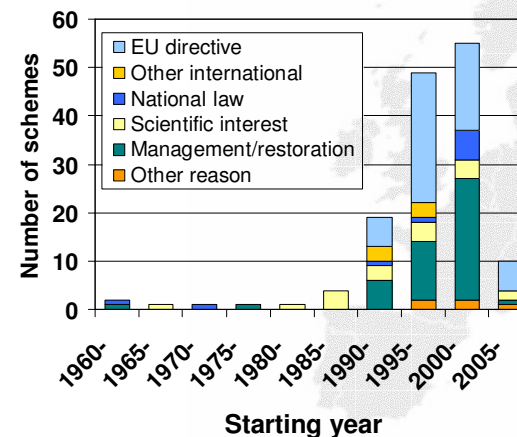
What is habitat monitoring?

- the repeated recording of the condition of habitats, habitat types or ecosystems of interest to detect or measure deviations from a predetermined standard, target state or previous status (after *Hellawell 1991*)
- types of habitat monitoring:
 - remote sensing (satellite image, aerial photograph) / field mapping
 - holistic (full) / targeted (partial)



Current practices 1

- 150 schemes in DaEuMon database; most are recent (1990-)



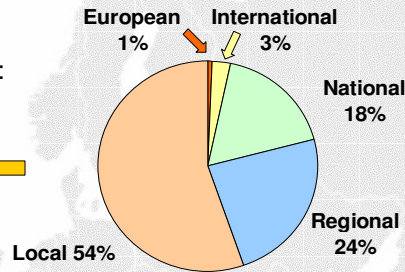
Main funding source:
European Union: 49%
National government: 35%
Regional sources: 8%
Private, scientific grant or other: < 5% each



Current practices 2

- **geographical scope:**

known gaps in data:
international, site-based
programmes
(e.g. GLORIA, ILTER)



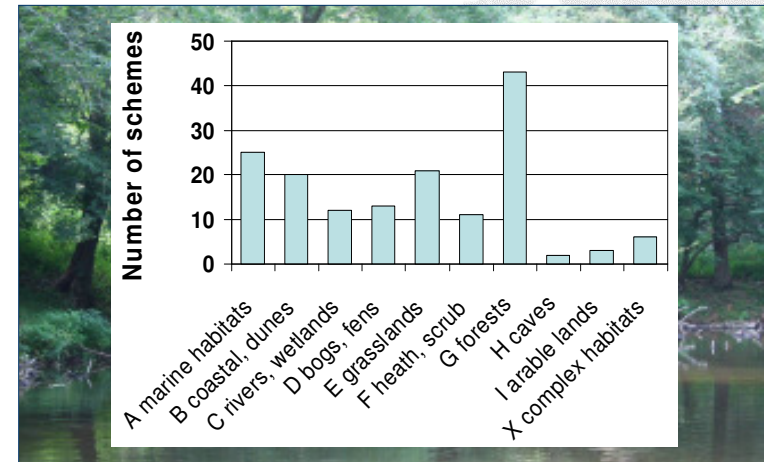
- **country coverage:**

Spain 33, Greece 28, UK 22,
Poland 17, France 12,
Hungary 10, Germany 7,
Cyprus 3, three countries 2,
eight countries 1 (19 total)

some countries are not
represented, some others
are under-represented

Current practices 3

- **habitat types monitored (EUNIS): the sign of forestry past**



Current practices: costs

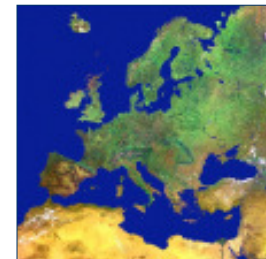
	EA	EC	ED	EE	EF	EI	
	PERSD	TOTAL	SALARY DAY	SALARY COSTS	EQUIPMENT COSTS	TOTAL COST PER YEAR	
1	h33	PERSD TOTAL	SALARY DAY	SALARY COSTS	h34	EQUIPMENT COSTS	TOTAL COST PER YEAR
2	84	84	27.479	2308.235	7000	7000	9308.236
3	10	10	103.014	343.38	0	0	343.38
4	17	17	19.479	331.143	0	0	66.2286
5	6	6	19.479	116.874	0	0	23.3748
38	30	30	95.37	0	5000	5000	5000
39	740	740	68.479	16358.14636	373295	373295	389654.1464
40	313	313	68.479	14487.95133	513000	513000	527487.9513
54	30	30	19.479	584.37	300	300	864.37
65	400	400	95.065	14258.25	30000	30000	8851.65
66	30	30	95.37	2851.1	100	100	2951.1
67	20	20	95.37	1907.4	100	100	2007.4
68	30	30	95.37	2851.1	100	100	2951.1
87	35	35	82.219	2877.665	300	300	3177.665
88	0	0	103.014	0	0	0	0
89	0	0	103.014	0	0	0	0

• **Total costs: 81 M EURO per year**

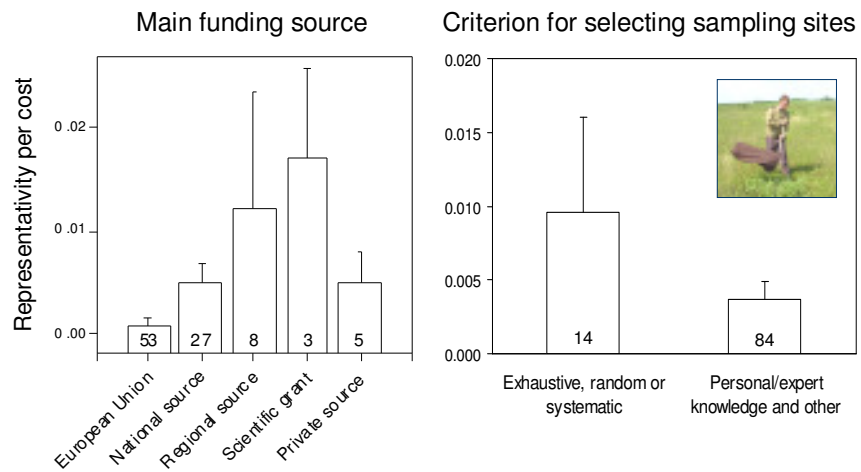
Is it well spent?

Cost-effectiveness

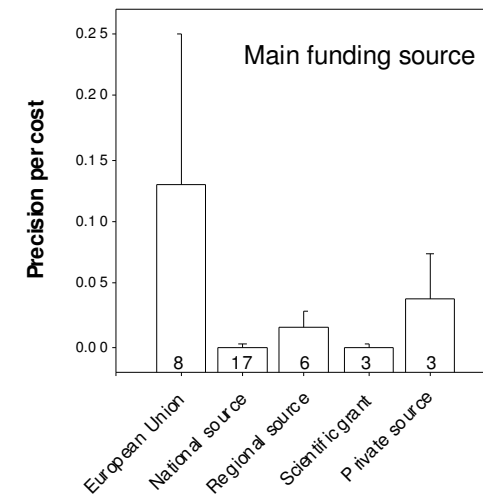
- **representativity:** how good is sampling design (scores)
- **precision:** how intense is sampling effort (estimates)
- **cost-effectiveness:** representativity per cost and precision per cost



Cost-effectiveness based on representativity



Cost effectiveness based on precision



Is monitoring money well spent?

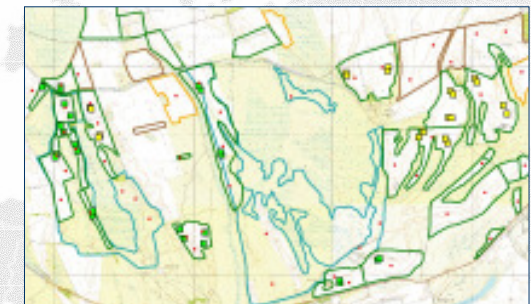
- we do not know because there are no established references, but
- our method can be used to assess AND improve the cost-effectiveness of monitoring



Systematic evaluation: an example



Egyek-Pusztakócs marsh/grassland system, Hortobágy National Park, E Hungary



Systematic evaluation: an example

	All schemes	Example scheme		
	Mean \pm SD	Value	Rank	Percentile
Representativity score	5.7 \pm 2.1	5	81st	56
Precision index	95.6 \pm 481	86.4	5th	90
Representativity per cost	0.005 \pm 0.014	0.0054	35th	64
Precision per cost	0.048 \pm 0.183	0.016	6th	84



- primary way to increase cost effectiveness:
increase representativity

Conclusions: costs and methods

- habitat monitoring is costly
- many new schemes, funded by EU, but fragmented in scope
- representativity, precision (and other measures) differ by reasons for launching, funding source etc.
- it is essential to quantify cost-effectiveness across schemes
- and to improve or integrate current practices in monitoring, especially considering future challenges



Manuscripts related to talk:

- Lengyel S, Déri E, Varga Z, Horváth R, Tóthmérész B, Henry P-Y, Kobler A, Kutnar L, Babij V, Seliškar A, Christia C, Papastergiadou E, Gruber B, Henle K. *In review. Habitat monitoring in Europe: a description of current practices. Biodiversity and Conservation.*
- Lengyel S, Kobler A, Kutnar L, Framstad E, Henry P-Y, Babij V, Gruber B, Schmeller D, Henle K. *In review. A framework for the integration of biodiversity monitoring at the habitat level. Biodiversity and Conservation.*
- Lengyel S, Tóthmérész B, Henry P-Y, Kutnar L, Babij V, Henle K. *In review. What determines scientific quality and cost-effectiveness in European habitat monitoring?: An evaluation and a method. Conservation Biology.*