The monitoring program for species and habitats of community interest in Lombardy
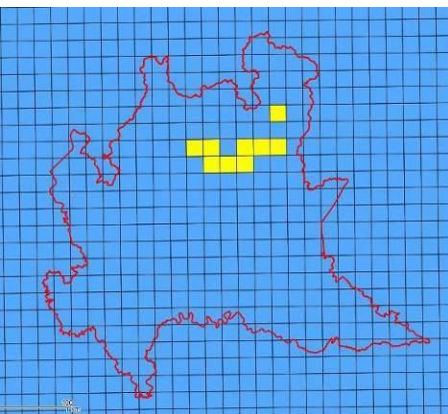
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1. Starting principles

Monitoring species and habitats of community interest

- is mandatory according to Habitat (art. 17) and Birds (art. 12) Directives
- is a basic task for conservation
- ideally requires well-defined indicators and relative values to be used for assessments and comparisons (reference values)
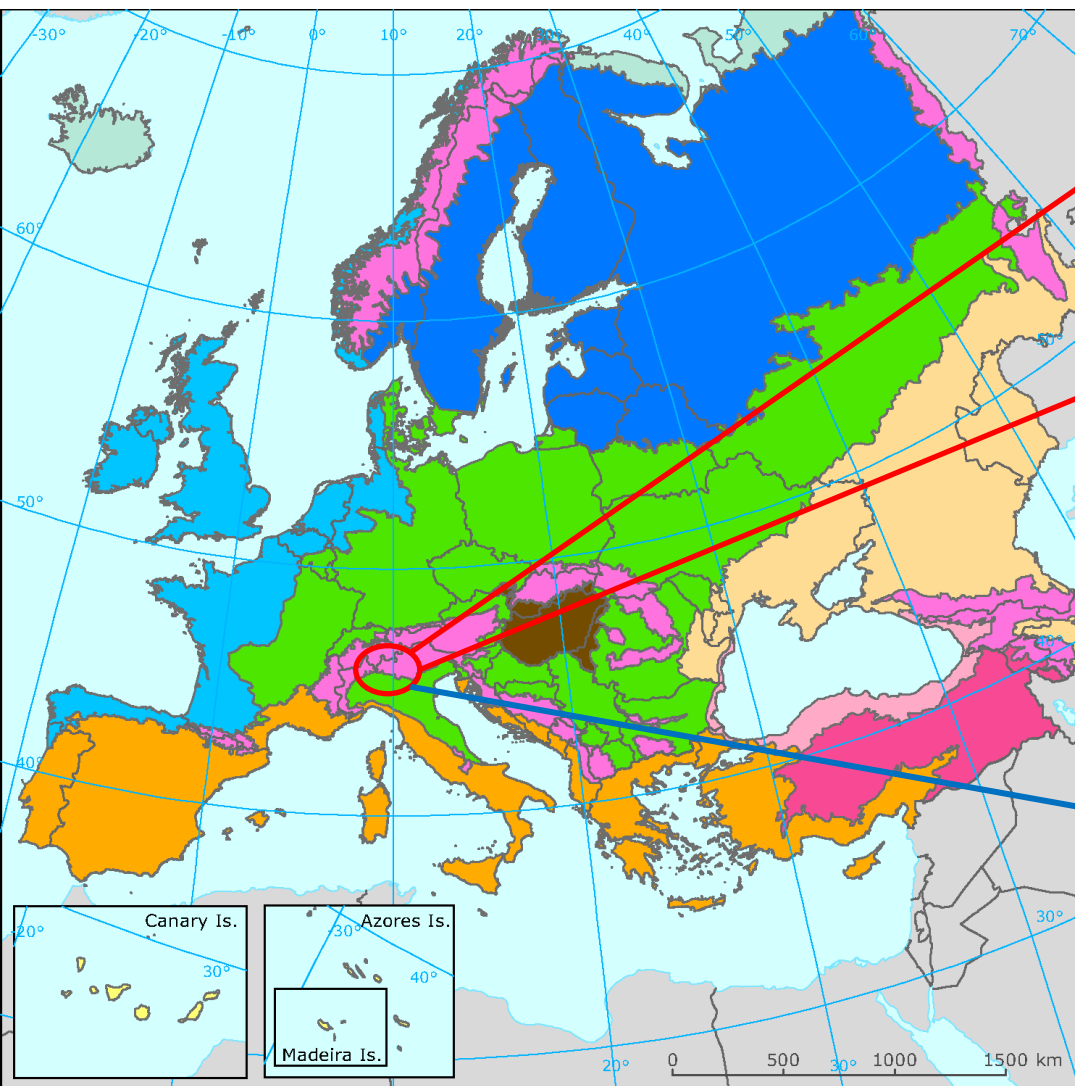

M. Noseda

Biogeographic regions in Europe, 2011

- Alpine
- Anatolian
- Arctic
- Atlantic
- Black Sea
- Boreal
- Continental
- Macaronesia
- Mediterranean
- Pannonian
- Steppic

Outside data coverage

1. Starting principles

monitoring program includes
- 27 plant species
- 53 habitats
- 16 invertebrates
- 19 fishes
- 12 amphibians
- 8 reptiles
- 82 birds
- 33 mammals

S. Corezzola

M. Spada

53 Habitats, including 13 priority types

Categories	Habitat types
31. Standing water	4
32. Running water	5
4. Temperate heath and scrub	4
61. Natural grassland	2
62. Semi-natural dry grasslands and scrublands facies	2
64. Semi-natural tall-herb humid meadows	2
65. Mesophile grasslands	2
71. Sphagnum acid bogs	3
72. Calcareous fens	4
81. Scree	3
82. Rochy slopes with chasmophytic vegetation	4
83. Other rocky habitats	2
91 Forest of Temperate Europe	11
92. Mediterranean deciduous forests	1
93.Mediterranean sclerophyllus forests	1
94. Temperate mountainous coniferous forests	3

1. Starting principles

Indicators of conservation status

- allow for a more explicit and transparent evaluation of conservation status
- may help set conservation objectives
- can be useful at different spatial scales, from continental to local, including at the regional level ('administrative' scale at which data are collected and summarised first)

1. Starting principles

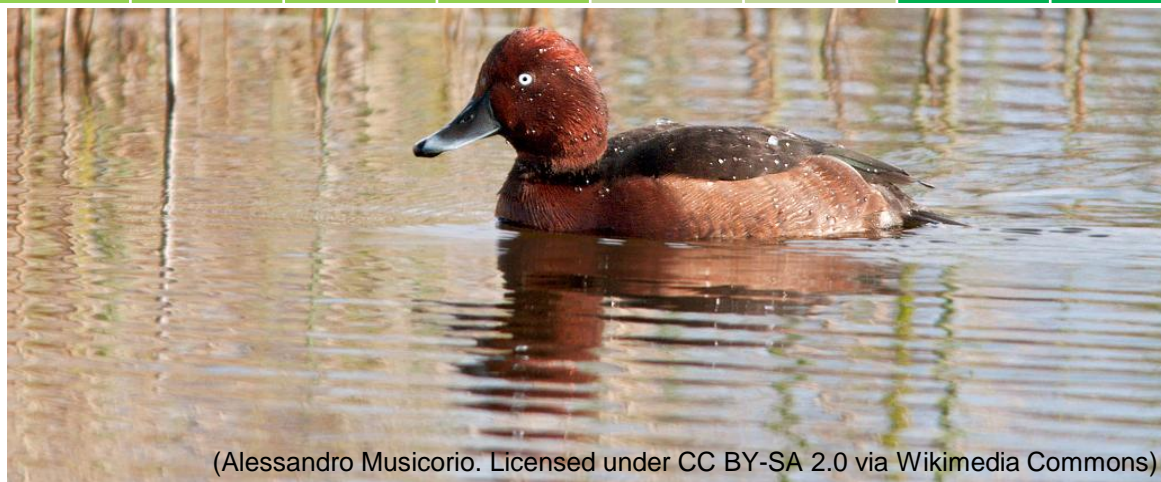Habitat and species should be in Favourable Conservation Status (FCS; Art. 1 DH):

- Favourable Reference Values (FRV) should be calculated

  (art. 17 DH; for birds: Brambilla et al. 2011. Bird Conservation International 21:107-118)

- monitoring indicators should allow for a comparison with FRVs

- FCS means that population, range and habitat (or structure and function) of a species (or habitat) are doing well and will reasonably do so also in the future

(M. Noseda)

- when possible, specific conservation objectives have been defined to help the definition of FRVs:

	POPULATION					RANGE		HABITAT			
	size or density	trend	breeding par.	structure	type of counts	extent	trend	extent	quality	trend of extent	trend of quality
Aythya nyroca	PFR-S	+			mon. pop.	RFR	+	HRV-E	HRV-Q	0	+

(Alessandro Musicorio. Licensed under CC BY-SA 2.0 via Wikimedia Commons)

Indicators and assessment of conservation status of Habitat

e.g. FOREST

Habitat structure
- % total coverage - tree layer
- % typical species dominance
- n. mature trees
- m^3/ha fallen dead wood
- % total coverage - litter the ground

Habitat functions
- n. typical species
- n. important plant species
- n. other important species (eg mushrooms)

Future Prospects
- Threats and pressures
- % evolution indicators (eg renewal)
- % deterioration indicators (eg. exotic plant)
- % nithrofilous plant species

Indicators and assessment of conservation status of plant species

e.g. *Saxifraga tombeanensis* Boiss. Ex Engl.

Population
- n. populations
- n. population units
- %. fertile population units
- % health status of the population units

Habitat for the species
- Habitat area (m^2, environmental units)
- % coverage woody vascolar plants

Future Prospects
- Threats and pressures
- Habitat fragmentetion

2. Monitoring techniques

Data collection should be

- useful to evaluate conservation status according to indicators and objectives
- based on the most effective methods
- subjected to field validation

2. Monitoring techniques

literature and project (e.g. LIFE) surveys to identify methods

⬇

first definition of potential techniques

⬇

preliminary distribution models

⬇

field surveys

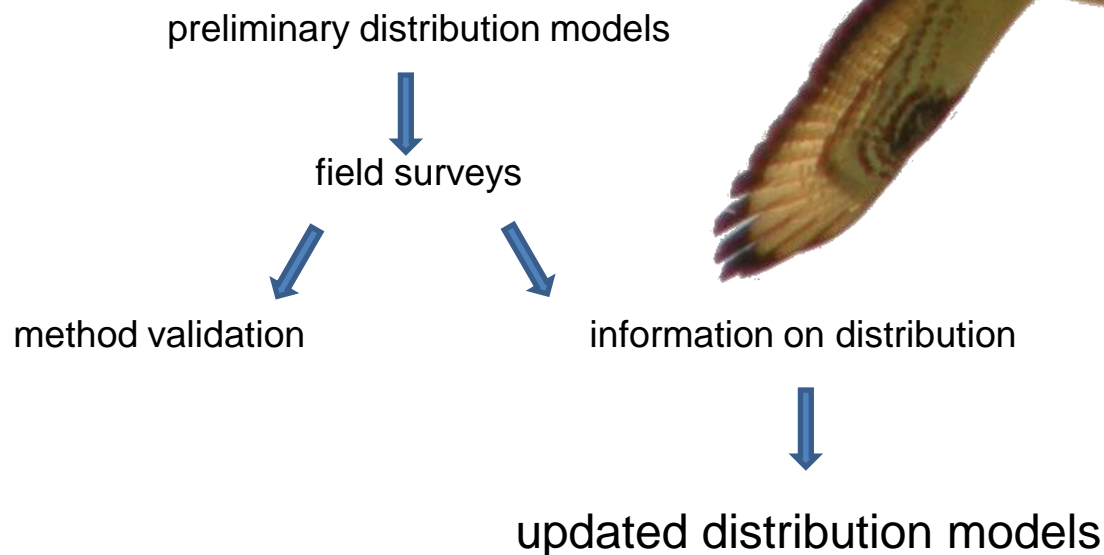⬇   ⬇

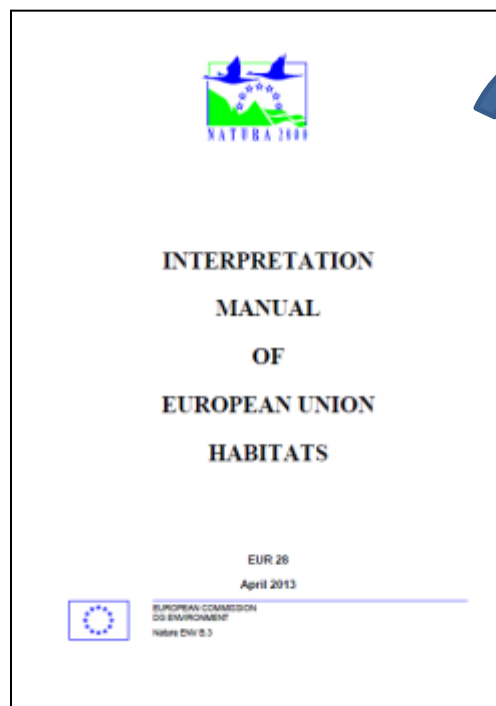method validation   information on distribution

L. Spada

1. Species and habitat distribution

- critical review and summary of available information
- habitats: critical intepretation and revision
- species: distribution modelling (crayfish, birds, mammals)

preliminary distribution models

↓

field surveys

↙   ↘

method validation   information on distribution

↓

updated distribution models

Habitats: critical interpretation and revision

WHAT ABOUT typical species of the Habitats in LOMBARDY REGION?

TYPICAL SPECIES

9180*	**Tilio-Acerion forests of slopes, screes and ravines**
List of typical species	**Dominant plants**: • Tree species: *Acer pseudoplatanus, Fraxinus excelsior, Tilia cordata,Tilia plathyphyllos* • Herbaceous species: *Actaea spicata, Adoxa moschatellina, Anthriscus nitida, Aruncus dioicus, Asperula taurina, Campanula latifolia, Galeopsis speciosa, Geranium robertianum, Lunaria rediviva, Petasites albus Phyllitis scolopendrium, Polystichum sp.pl.* **Indicator plants**: • Tree species: *Fagus sylvatica, Ulmus glabra* • Herbaceous species: *Arum maculatum, Asarum europaeum, Cardamine pentaphyllos, Chrysosplenium alternifolium, Dryopteris sp.pl., Festuca altissima, Galium odoratum, Helleborus viridis, Impatiens noli-tangere, Lamiastrum galeobdolon, Oxalis acetosella, Poa nemoralis, Polygonatum verticillatum, Senecio nemorensis agg., Sesleria varia*

Review of shapefiles and cartography

4. Monitoring protocols for species and habitats

field methods:
- what technique(s) and how to implement them
- where to do: list of sites/areas (precise points, single pools, sample areas, river portions, etc.)
- when to do: periods (dates, intra- and inter-annual frequency)
- indicators: what to measure and compare

archivio CNBF Bosco Fontana

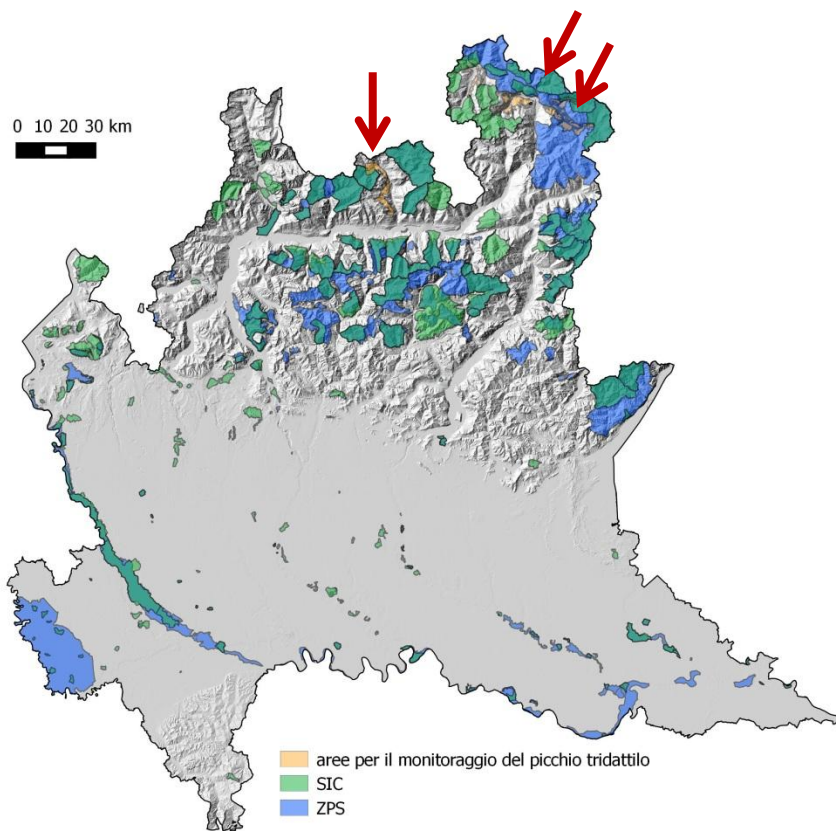4. Monitoring protocols: optimizazion: save costs and time

for species fullfilling the following criteria:

- species occupying the same habitats and occurring in the same sites
- species that should be monitored in the same time (period and time of the day), with the same method(s)

a multi-species survey protocol could be adopted

- little bittern + moustached warbler;
- colonial herons + glossy ibis + spoonbill;
- honey buzzard + black kite + short-toed eagle;
- grey + black + three-toed woodpecker;
- red-footed falcon + lesser kestrel + roller;
- black tern + whiskered tern;
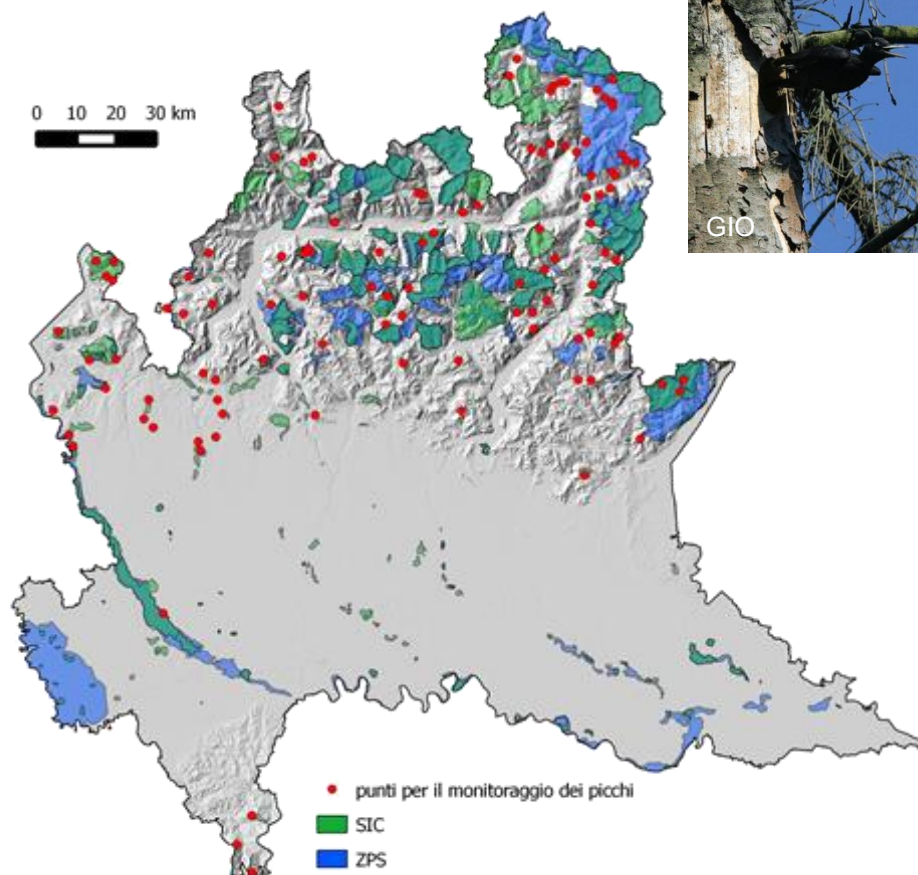- woodlark + tawny pipit + barred warbler + red-backed shrike + lesser grey shrike + ortolan bunting

4. Monitoring protocols for species and habitats

aree per il monitoraggio del picchio tridattilo
SIC
ZPS

Picoides tridactylus

4. Monitoring protocols for species and habitats

Dryocopus martius

GIO

idoneità bas
idoneità me
idoneità

aree per il monitoraggio del picchio tridattilo
SIC
ZPS

0 10 20 30 km

• punti per il monitoraggio dei picchi
SIC
ZPS

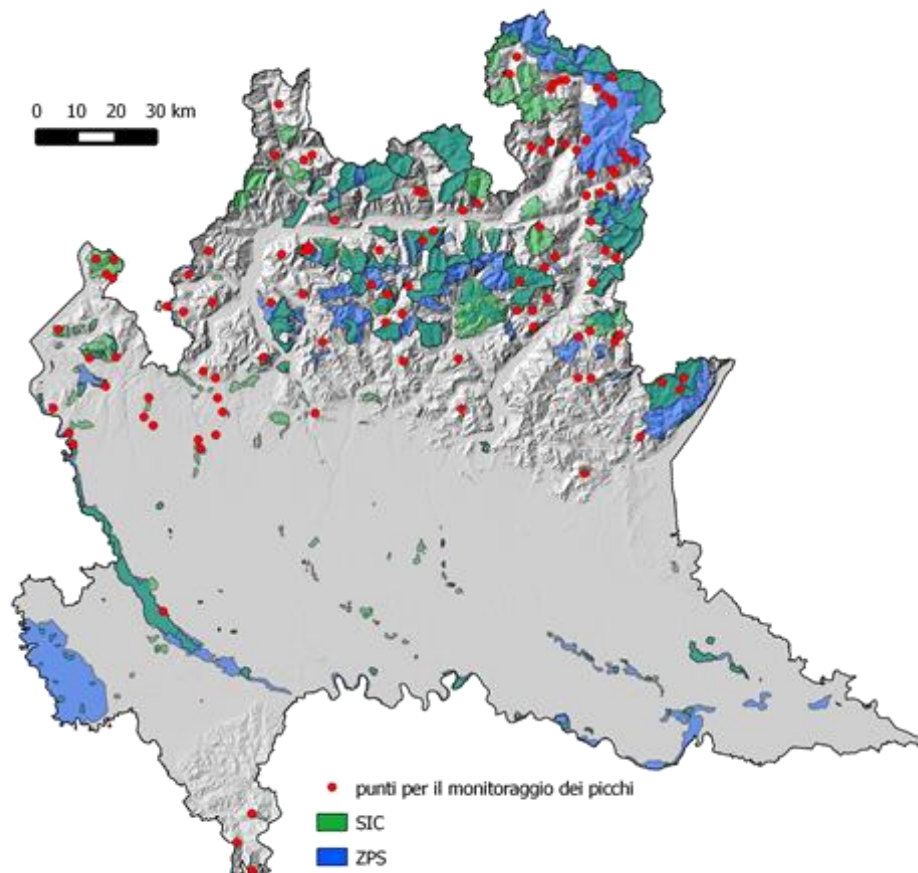## 4. Monitoring protocols for species and habitats

Picidae

point counts useful to monitor:

>> core areas for black woodpecker and occurrence sites of the other two (rare) species

>> main expansion direction of black woodpecker

>> ongoing expansion of grey and three-toed woodpecker

Optimizazion: farmland birds

Cod.	Scientific name	Common name	Phenology (monitoring)	Monitoring unit	Monitoring indicator
	PASSERIFORMES ALAUDIDAE				
A246	*Lullula arborea*	Woodlark	SB	population breeding in sample areas	number of territories in sample areas
	MOTACILLIDAE				
A255	*Anthus campestris*	Tawny pipit	MB	population breeding in sample areas	number of territories in sample areas
	MUSCICAPIDAE (SYLVIINAE)				
A307	*Sylvia nisoria*	Barred warbler	MB	population breeding in sample areas	number of territories in sample areas
	LANIIDAE				
A338	*Lanius collurio*	Red-backed shrike	MB	population breeding in sample areas	number of territories in sample areas
A339	*Lanius minor*	Lesser grey shrike	MB	population breeding in sample areas	number of territories in sample areas
	EMBERIZIDAE (EMBERIZINAE)				
A379	*Emberiza hortulana*	Ortolan bunting	MB	population breeding in sample areas	number of territories in sample areas

Optimizazion: farmland birds

species	breeding period	ideal period for monitoring
woodlark	March-early May (first brood) half May-early July (second brood)	15 March - 10 May (first brood) 20 May - 10 July (second brood)
tawny pipit	May-July	15 May - 15 July
barred warbler	June-July	1 June - 20 July
red-backed shrike	June-July	1 June - 10 July
lesser grey shrike	June-July	1 June - 20 July
ortolan bunting	May-July	5 May - 15 July

1 June – 10 July: suitable for monitoring ALL species

Optimizazion: farmland birds

Species	Estimated regional population (bp)	precisely mapped territories (2014)	% of regional population
Woodlark	1000-1500	435	30-40%
Tawny pipit	<100	48	≥ 50%
Barred warbler	?	10	(≥ 50%)
Red-backed shrike	2500-5000	1005	c. 30%
Lesser grey shrike	<15	10	> 65%
Ortolan bunting	< 300 (now probably much less!)	91	c. 30%

extremely good knowledge of species distribution
>> reliable models of real and potential distribution
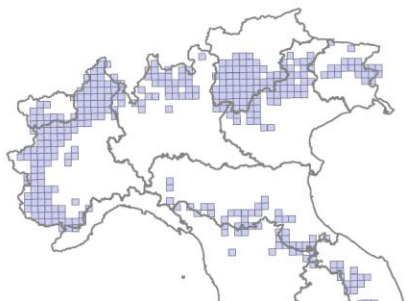>> robust location of sampling sites

Method	Frequency	Number of replicates	Period
Linear transects	every year	2	1 June - 10 July

Habitat Priority criteria

Conservation status, Priority habitat, Rarity, Representativity

Habitat type	Alpine	Continental
9180* Tilio-Acerion forests of slopes, screes and ravines	Unfavourable-bad	Unfavourable-Inadequate

Distribution map 9180

	9180* - Alp	9180* Cont
Priority habitat	X	X
Border regions	-	-
Area < 100 Ha	-	X
n. SCI < 10	-	X

Habitat type	Alpine	Continental
9180* Tilio-Acerion forests of slopes, screes and ravines	Priority level II	Priority level I

27 plant species

Species	II – IV HD	n.
Bryophyta	II	6
Pteridophyta	II, IV	3
Spermatophyta	II, IV	18

Saxifraga tombeanenis Boiss. ex Engl.

ALLEGATO II

Legenda

- Saxifraga tombeanensis
- dominio di studio
- minimo poligono convesso
- distribuzione potenziale di Saxifraga tombeanensis
- Lombardia

Periodo di fioritura	gennaio	febbraio	marzo	aprile	maggio	giugno	luglio	agosto	settembre	ottobre	novembre	dicembre
Adenophora liliifolia (L.) A.DC.							X	X				
Aquilegia alpina L.							X					
Asplenium adulterinum Milde s.l.							X	X	X			
Buxbaumia viridis (Lam. & DC.) Moug. & Nestl.						X	X	X	X			
Cypripedium calceolus L.					X	X	X					
Daphne petraea Leyb.					X	X						
Dicranum viride (Sull. & Lesq.) Lindb.	X	X	X	X	X	X	X	X	X	X	X	X
Dracocephalum austriacum L.					X	X						
Eleocharis carniolica W.D.J.Koch							X	X	X	X		
Gladiolus palustris Gaudin						X	X					
Hamatocaulis vernicosus (Mitt.) Hedenäs						X	X	X	X			
Himantoglossum adriaticum H. Baumann					X	X						
Isoetes malinverniana Ces. et De Not.							X	X	X	X		
Linaria tonzigii Lona							X	X				
Lindernia palustris Hartmann							X	X	X			
Liparis loeselii (L.) Rich.					X	X	X					
Mannia triandra (Scop.) Grolle				X	X	X						
Marsilea quadrifolia L.							X	X	X	X		
Meesia longiseta Hedw.						X	X	X	X			
Orthotrichum rogeri Brid.				X	X	X	X					
Paeonia officinalis L. subsp. banatica					X	X						
Physoplexis comosa (L.) Schur							X	X				
Primula glaucescens Moretti				X	X	X	X					
Primula spectabilis Tratt.					X	X	X					
Saxifraga presolanensis Engl.							X	X				
Saxifraga tombeanenis Boiss. ex Engl.					X	X	X					
Spiranthes aestivalis (Poir.) Rich.							X	X				

Plant species Priority criteria

Species	Alpine	Continental
Saxifraga tombeanensis	Unfavourable-Inadequate	-

IUCN categories: EN

RARITY

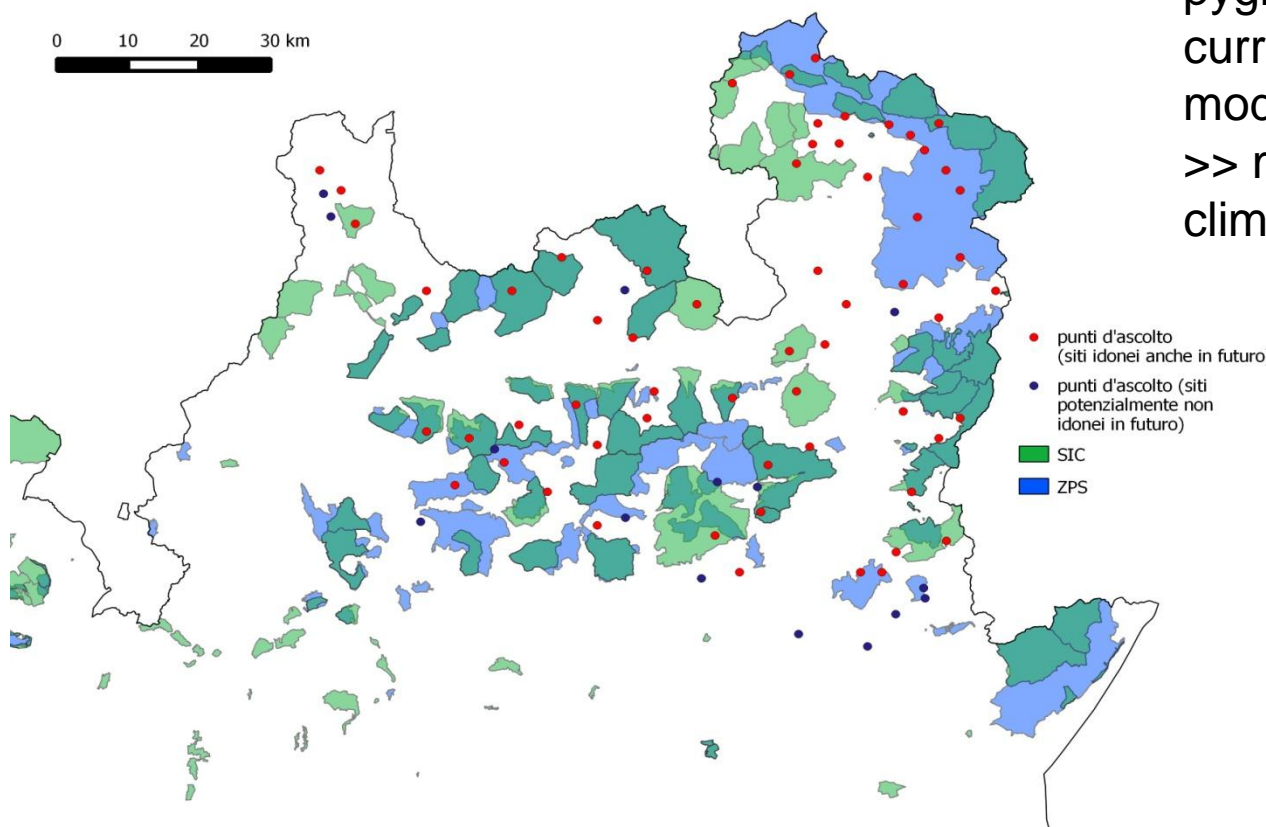| Species	Alpine	Continental
Saxifraga tombeanensis	Priority level I	-

Sites Priority criteria

- Pressures and threats for the Site (C): fragmentation, eutrophication, anthropic areas

- Presence of plant species (PS) and habitat (H) in Habitat Directive

$$GI = \text{Global Index} = (C/3) + PS + H$$

5. Special issues: climate change

pygmy owl and boreal owl current and future distribution models
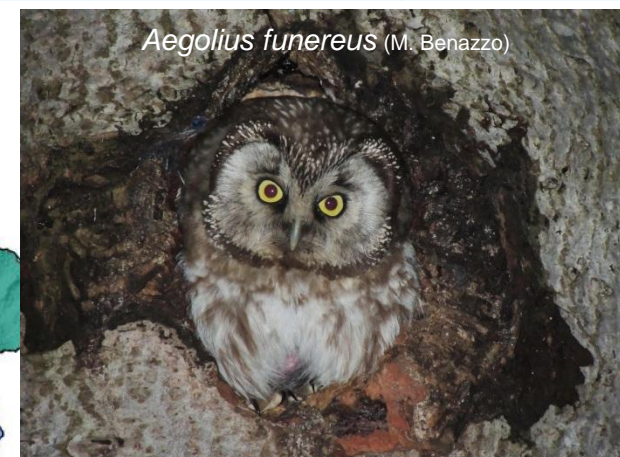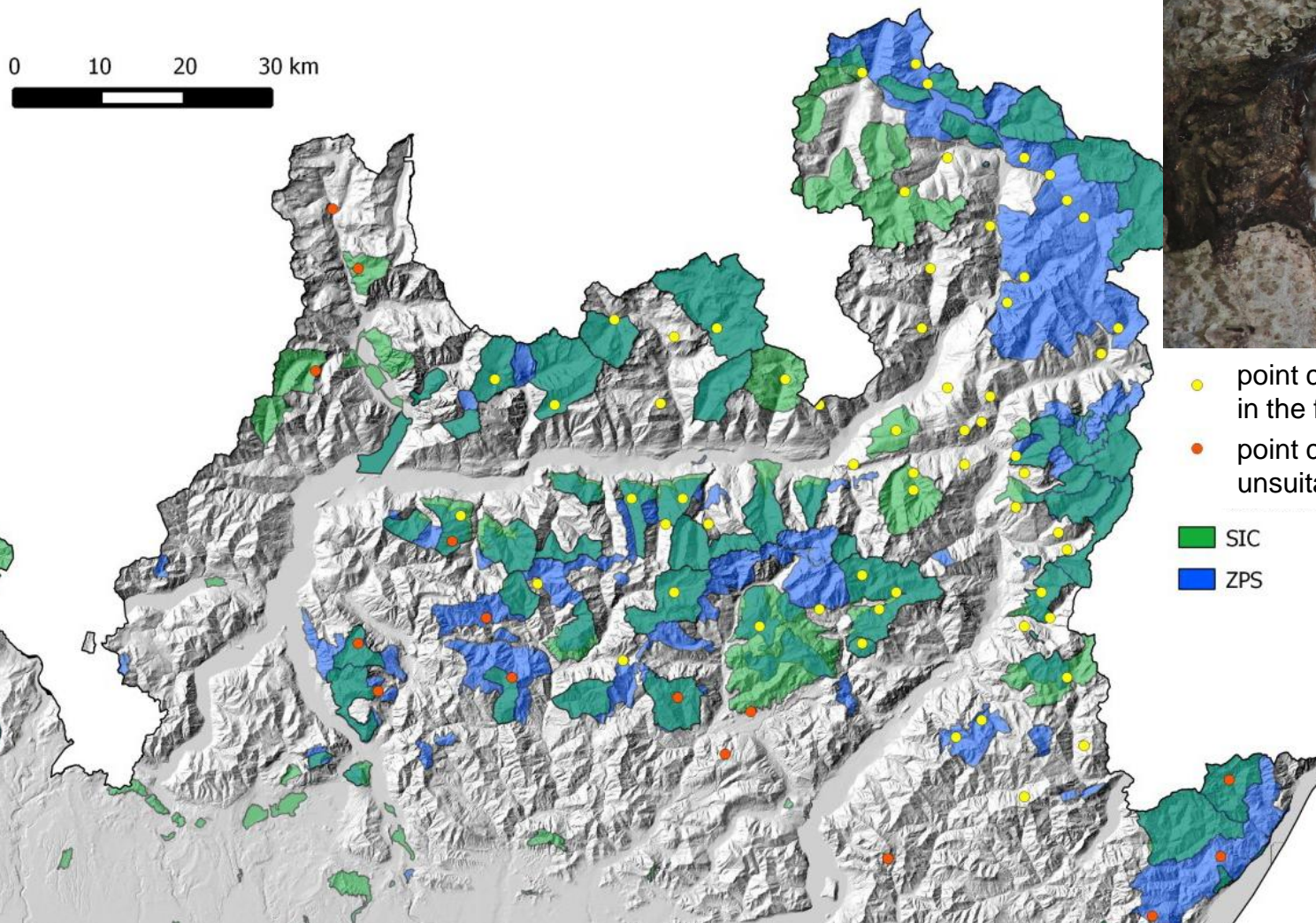>> monitoring variation due to climate change

- punti d'ascolto (siti idonei anche in futuro)
- punti d'ascolto (siti potenzialmente non idonei in futuro)
- SIC
- ZPS

Aegolius funereus (M. Benazzo)

- ● point counts (sites suitable also in the future)
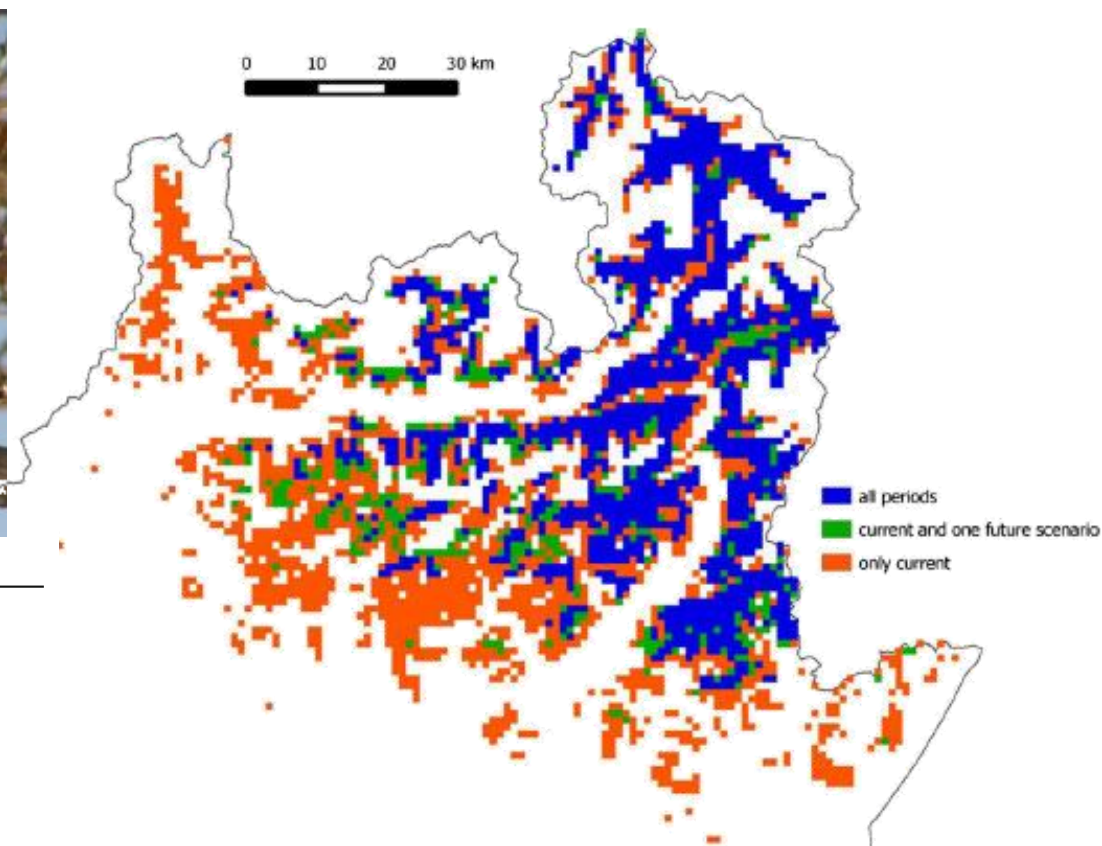- ● point counts (sites potentially unsuitable in the future)

- ▭ SIC
- ▭ ZPS

0   10   20   30 km

ORIGINAL PAPER

Current and future effectiveness of Natura 2000 network in the central Alps for the conservation of mountain forest owl species in a warming climate

Mattia Brambilla · Valentina Bergero · Enrico Bassi ·
Riccardo Falco

European Environment Agency
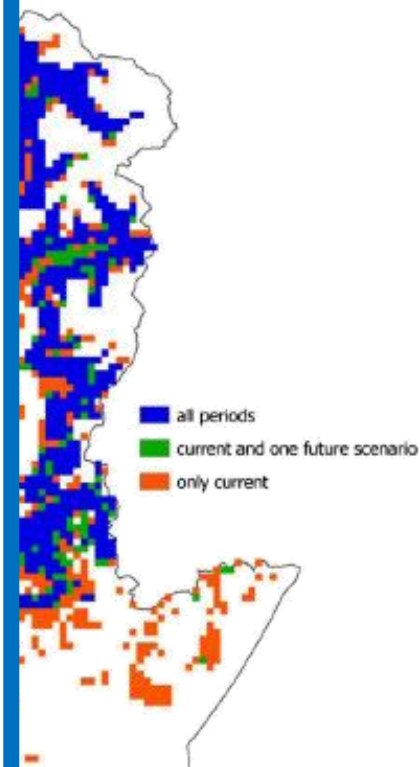European Topic Centre on
Biological Diversity

Technical paper N° 5/2014

all periods
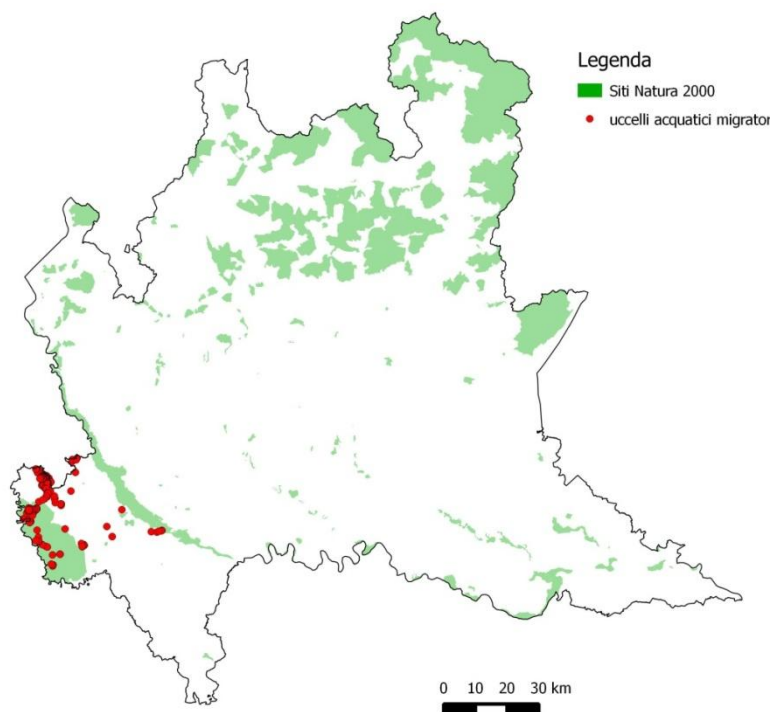current and one future scenario
only current

Literature Review

The ecological effectiveness of the Natura 2000 Network

McKenna Davis, Sandra Naumann,

Keighley McFarland, Andreas Graf and Doug Evans

Eur J Wildl Res (2015) 61:35–44
DOI 10.1007/s10344-014-0864-6

ORIGINAL PAPER

Current and future effectivene
in the central Alps for the cons
species in a warming climate

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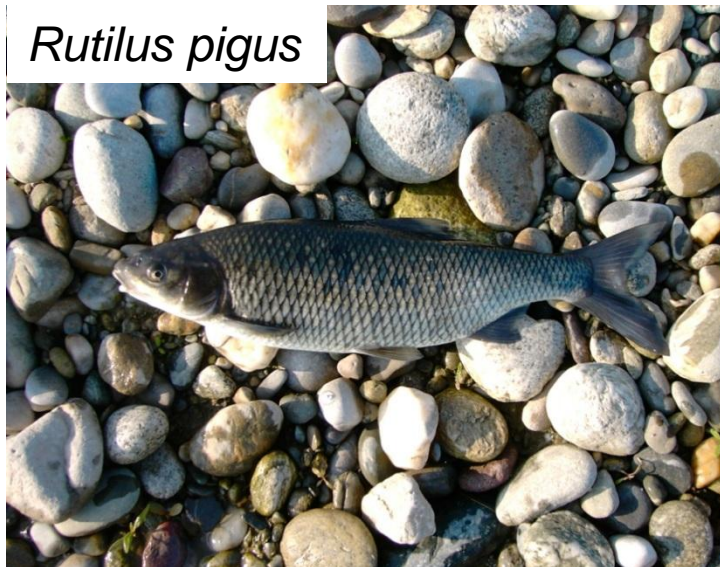Riccardo Falco

5. Special issues: not only abundance or occurrence data!

Monitoring conservation status may be better accomplished with other indicators than species' occurrence or abundance
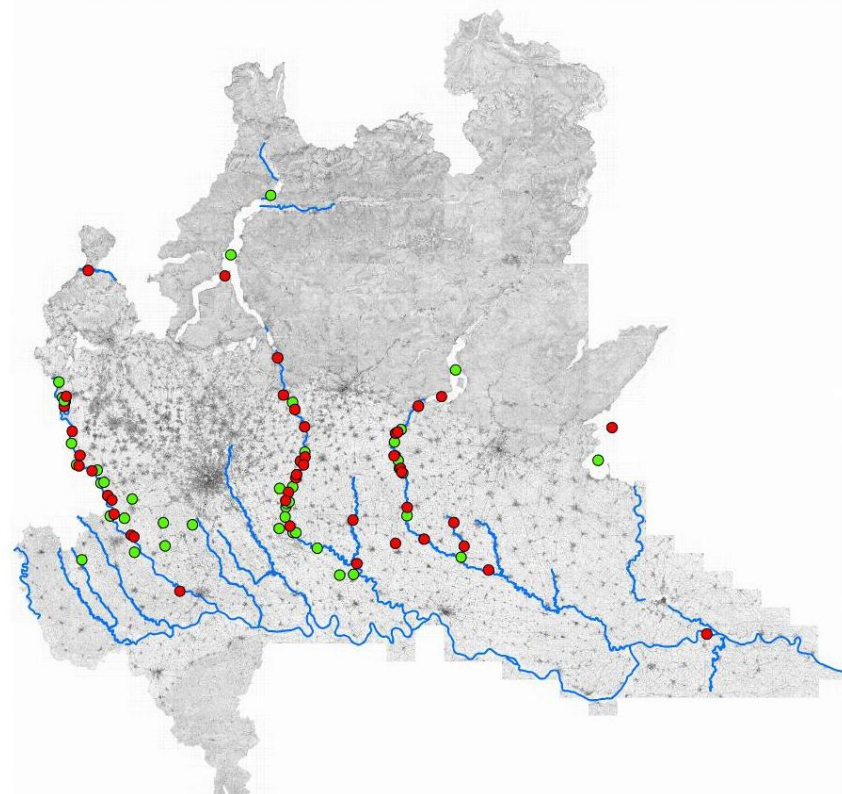

Legenda
Siti Natura 2000
uccelli acquatici migrator

0   10   20   30 km

migrant waterbids in ricefields:
maintaining suitable stop-over sites

Monitoring conservation status may be better accomplished with other indicators than species' occurrence or abundance

Rutilus pigus

range evaluation by means of electrofishing and commercial fishing data every 3 years

● Storico (prima del 2005)
● Recente (dal 2005)
— Range di riferimento

CONCLUDING REMARKS

The monitoring program in Lombardy
- also considers already existing monitoring schemes and complements them
- aims at involving volunteers (e.g. citizen science) and site managers
- optimizes costs/benefits
- includes the concept of FRVs
- aims at setting transparent indicators
- provides detailed protocols for species and habitat monitoring
- identify monitoring priorities

thanks!

MONITORING COSTS

the implementation of the whole monitoring program would cost (gross costs):

ANIMAL SPECIES: 635.500 €/year (was 941.588 before optimizazion – multispecies protocols and already existing monitoring schemes)

PLANT SPECIES: 152.320 €

HABITATS: 717.570 €

this means
780.482 €/year doing plant and habitat monitoring every 6 years