

Current distribution, population trends and threat status of the Aquatic Warbler *Acrocephalus paludicola*



Martin Flade, Brodowin, Germany

on behalf of the
BirdLife International Aquatic Warbler Conservation Team



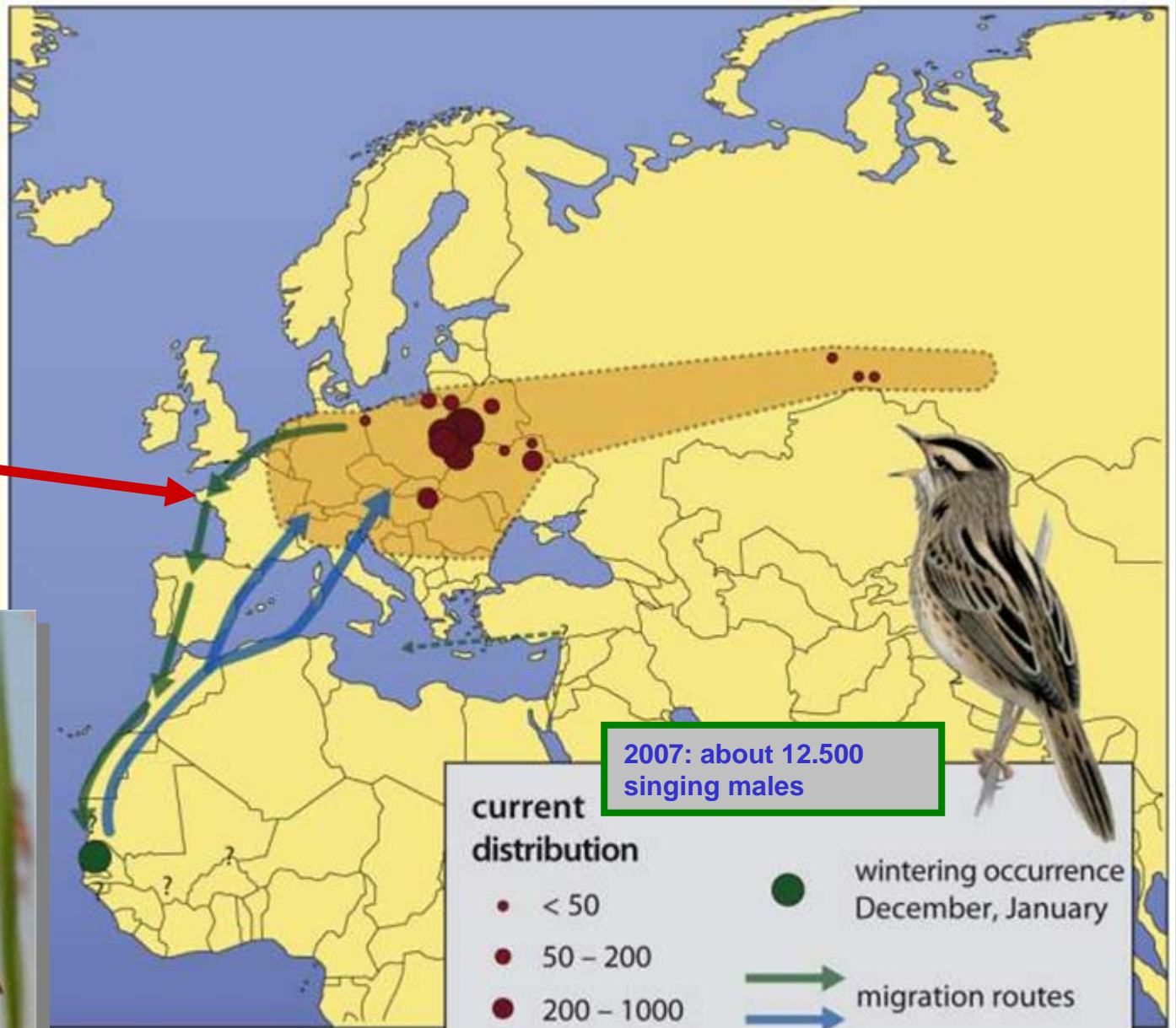


Characteristics of the Aquatic Warbler *Acrocephalus paludicola*

- ✓ Most threatened passerine bird of continental Europe, classified as 'vulnerable' at a global scale
- ✓ inhabiting large open mesotrophic to eutrophic fens and grassy marshes of central Europe and W-Siberia
- ✓ population decline by >95 % during the 20th century
- ✓ no pair bonds, successive polygyny and promiscuity
- ✓ uniparental care by the females
- ✓ multiple paternity, broods fathered by up to 5 different males
- ✓ high degree of flexibility and mobility as adaption to quickly changing habitats.

Aquatic Warbler range

Quimper



2007: about 12.500 singing males

current distribution

- < 50
- 50 – 200
- 200 – 1000
- 1000 – 5000
- > 5000

● wintering occurrence
December, January

→ migration routes

▭ former distribution



The BirdLife International Aquatic Warbler Conservation Team (AWCT) ...



an informal association of researchers and conservationists working on the Aquatic Warbler coming from all breeding range states and some stopover countries (France, Spain, UK)

Main research activities of AWCT since 1995

- ✓ Search for remaining AW populations in Europe and West-Siberia
- ✓ Systematic survey of Eurasian fen mires and their threat status
- ✓ Studies on breeding habitat structure and diet
- ✓ Studies on breeding biology, breeding success, predation
- ✓ Studies on mating system and reproduction system
- ✓ Analysis of the genetic population structure at different scales
- ✓ Studies on stopover behaviour and migration strategy
- ✓ Analysis of stable isotopes in AW feathers to identify wintering areas
- ✓ Desk study on and modelling of the potential African wintering grounds
- ✓ Search for AW wintering sites in West Africa (Senegal, Mauritania)
- ✓ Study on habitat features and habitat use, home range, seasonal movements and diet of wintering AW in the Senegal delta.

**Memorandum of Understanding
concerning
Conservation Measures
for the
Aquatic
Warbler**



**FIRST MEETING
OF SIGNATORIES AND SYMPOSIUM**

*24-27 June 2006, Lower Oder Valley
National Park, Criewen, Germany*

Aquatic Warbler



Global range

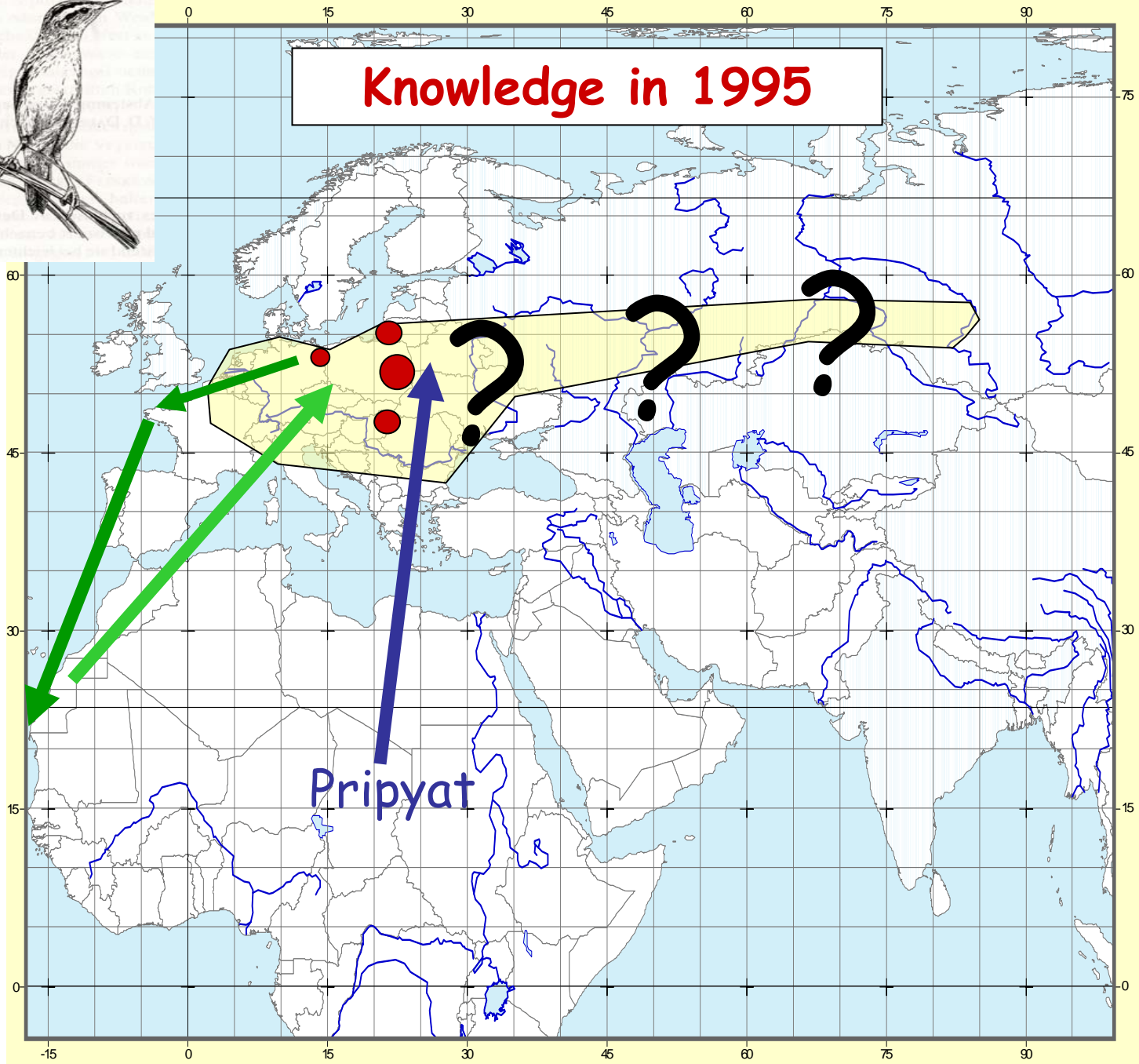
current breeding:

- <50
- 50-200
- 200-1000
- 1000-5000
- >5000
- Winter rec. (Dec., Jan.)

former range

← migration

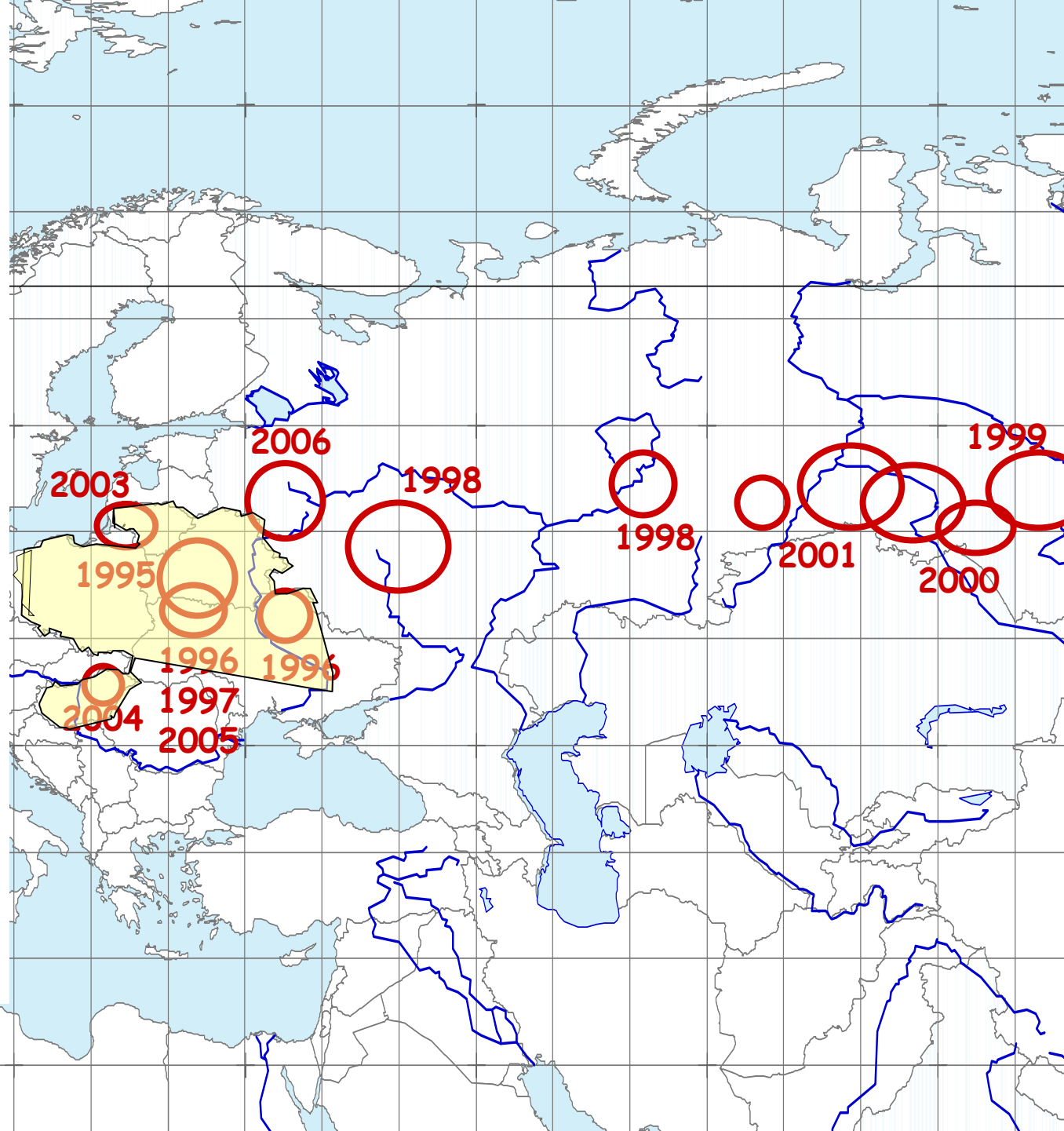
Knowledge in 1995





BirdLife AWCT
expeditions since
1995

and national follow-
up research









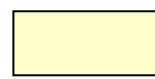
Aquatic Warbler



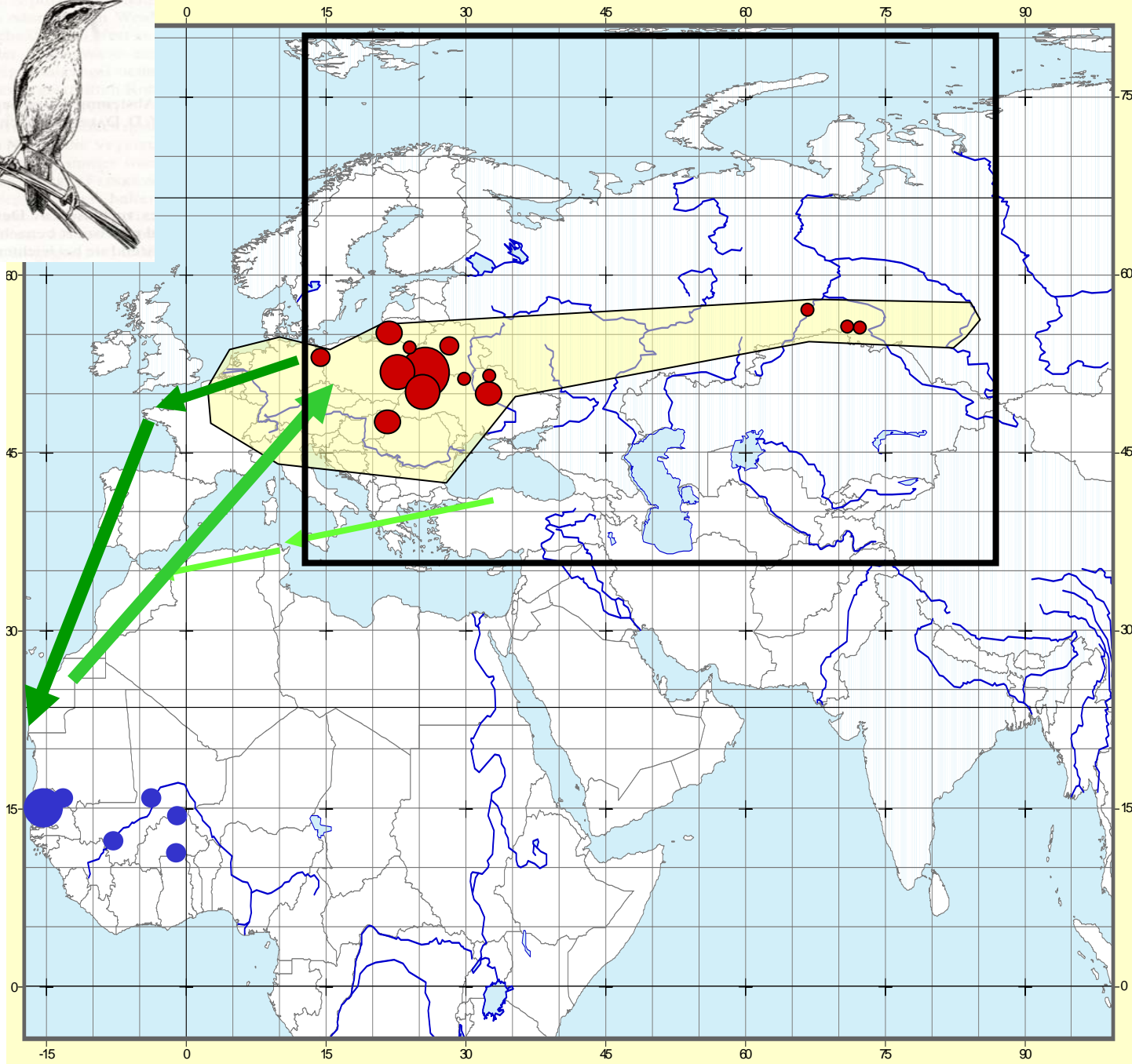
Global range

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 former range

 migration

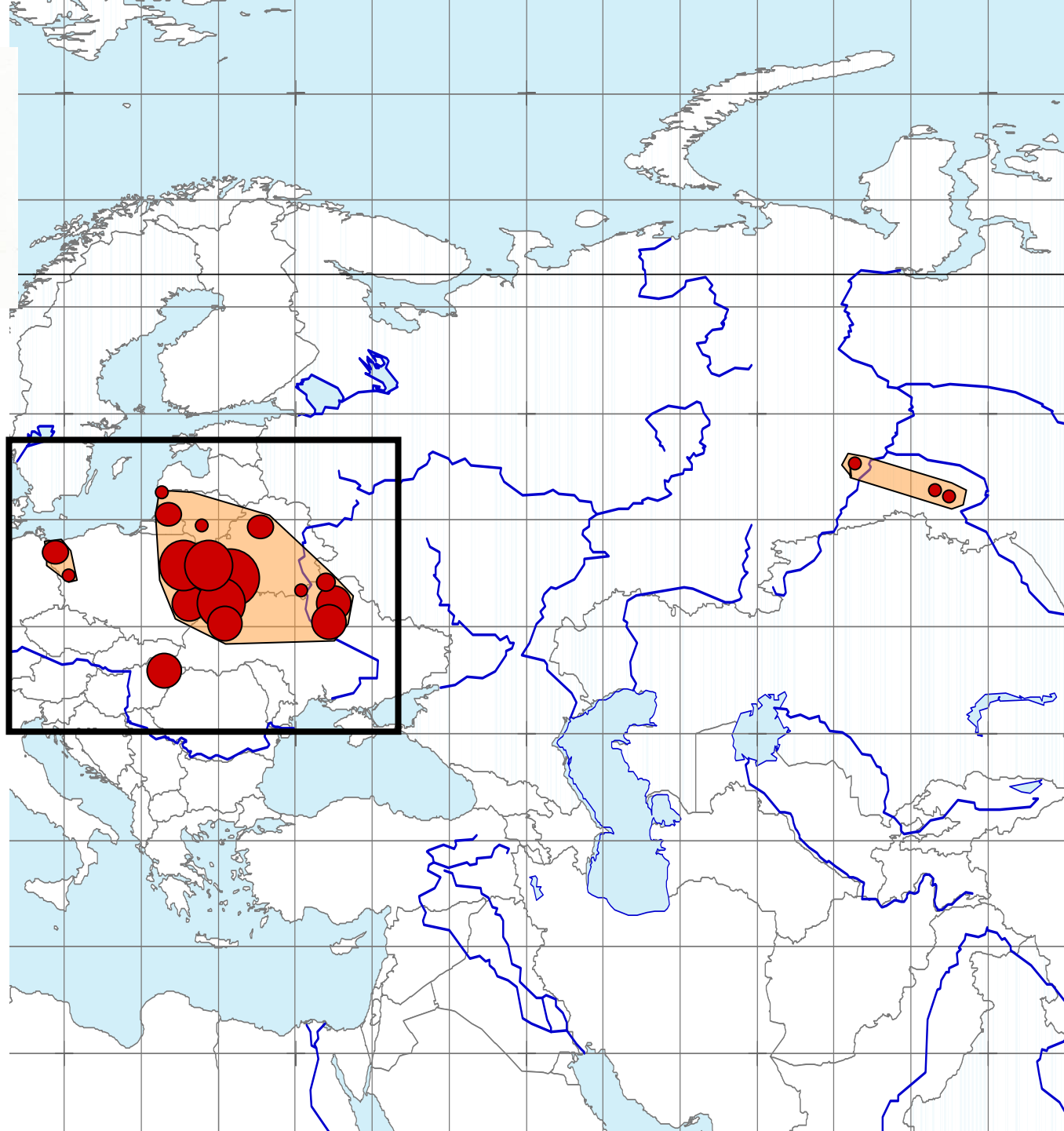


Aquatic Warbler



Current breeding distribution
(maximum number of singing males)

- 0-10
- 10-50
- 50-200
- 200-1000
- 1000-5000
- >5000



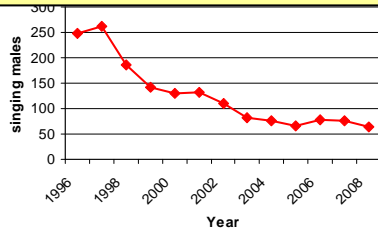
Aquatic Warbler



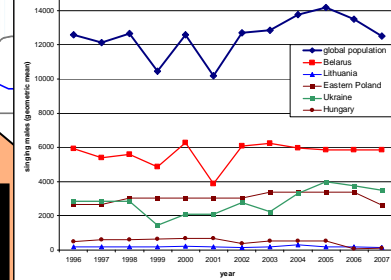
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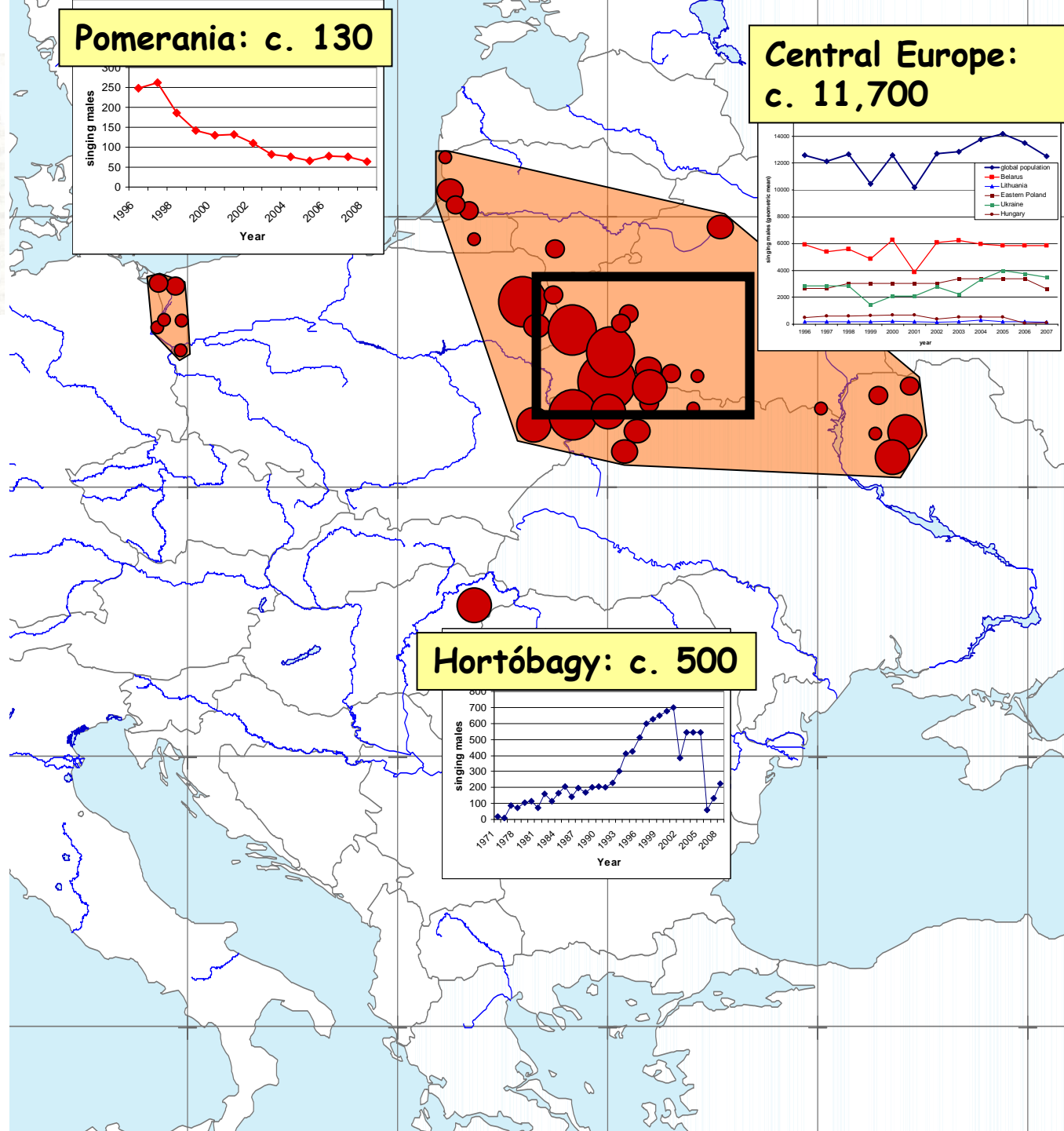
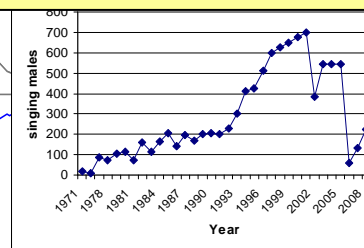
Pomerania: c. 130

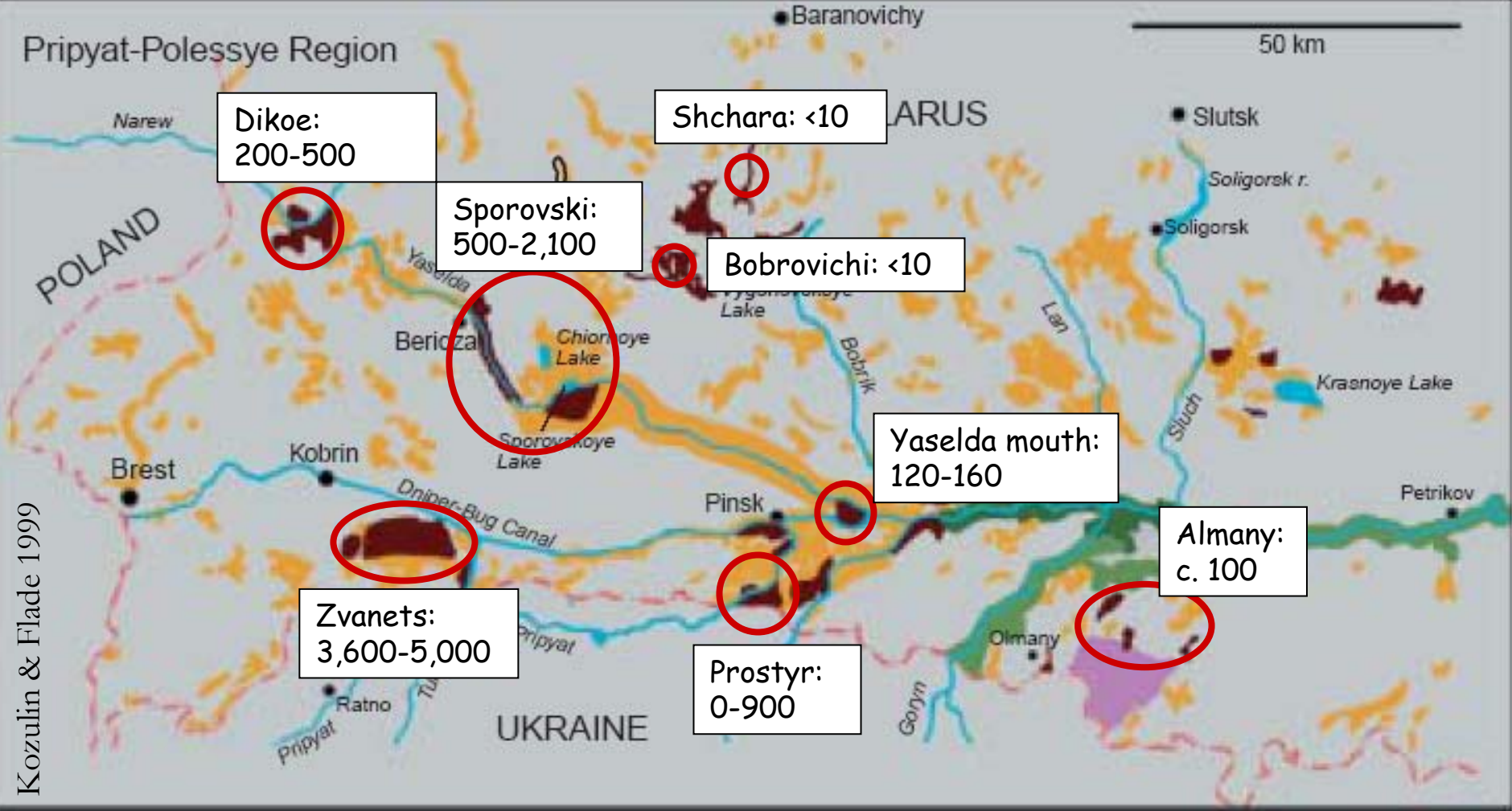


Central Europe: c. 11,700



Hortóbagy: c. 500

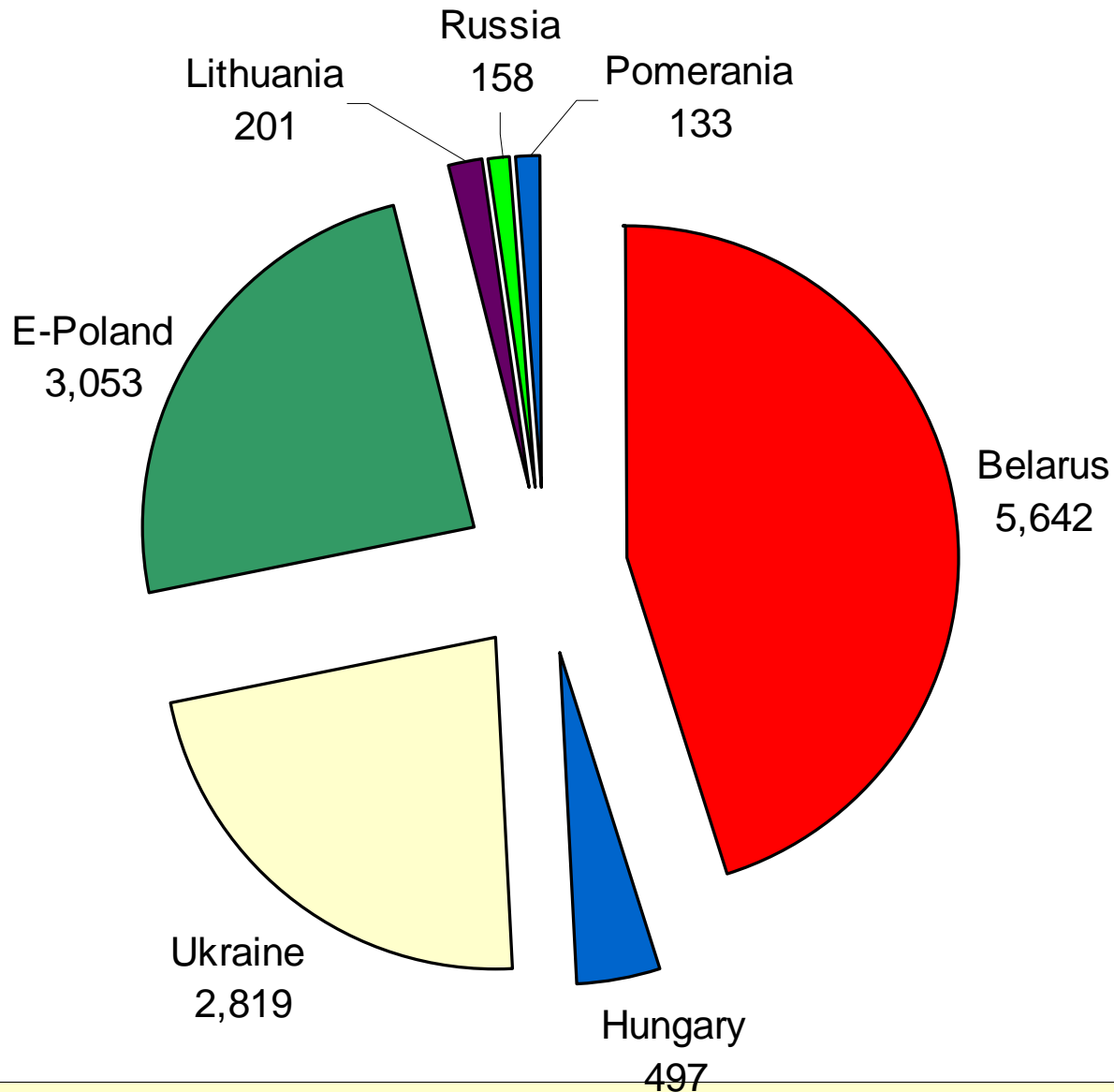




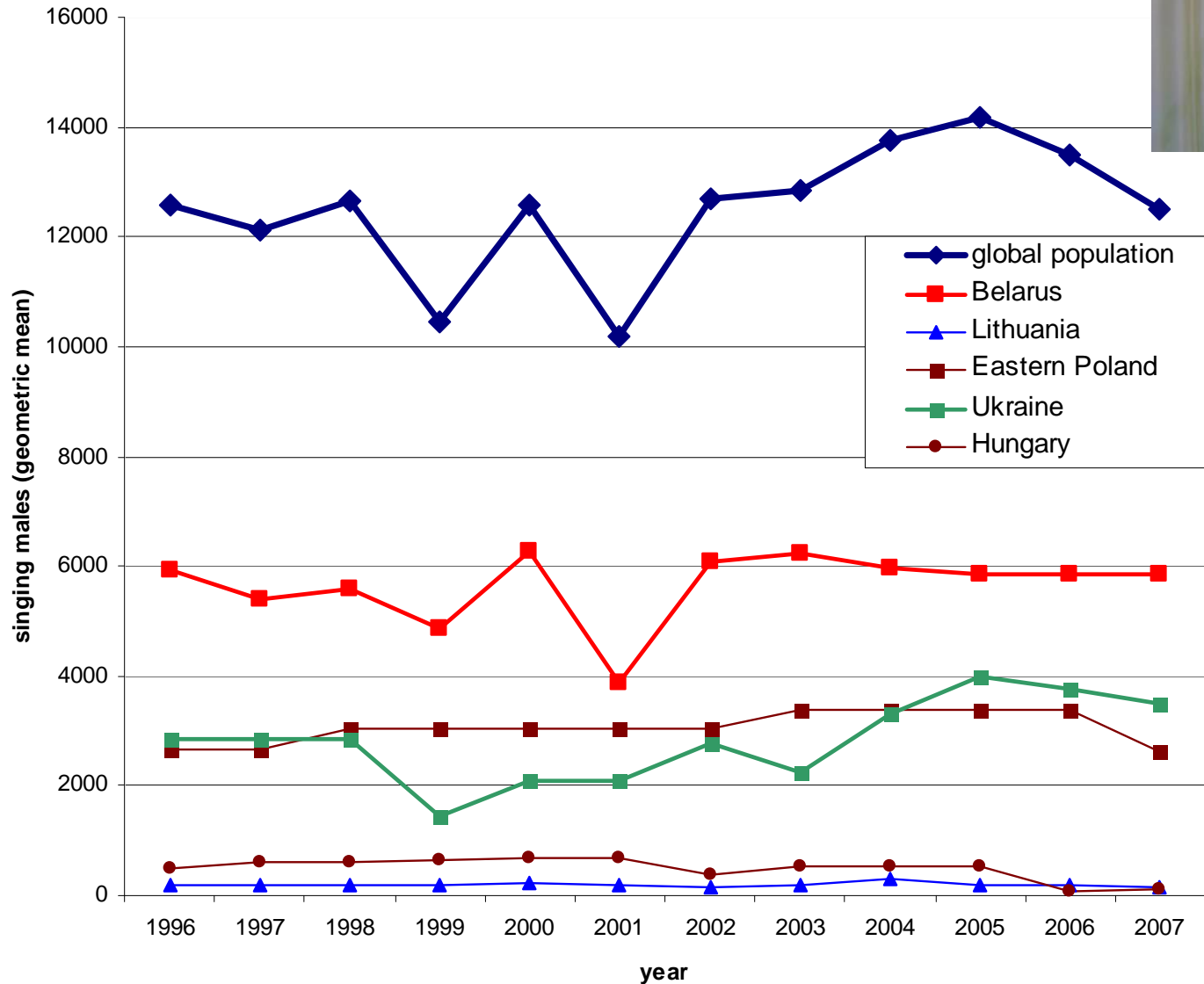
Kozulin & Flade 1999

Aquatic Warbler and fen mires in Belarus

Aquatic Warbler: average global population 1996-2007 (singing males)



Aquatic Warbler: global population (estimates)





Breeding site of **Aquatic Warbler**
in the middle Yaselda valley,
western Belarus
(eutrophic green mosses/sedge fen)



**Globally highest abundance of
Aquatic Warbler:**
up to 135 singing males/km²
but strong fluctuations



Optimal for Aquatic Warbler:
Zvanets, SW-Belarus (up to 5,000 singing males on 150 km²)



Zvanets, SW-Belarus



Zvanets, Belarus
24th of May, 1995





Borki, NW-Ukraine, summer 2005



Zvanets, Belarus, June 2004





Zvanets, Belarus, June 2005



Chervertnya, middle Styr river, W-Ukraine



Chornoghuzka, W-Ukraine, May 2005

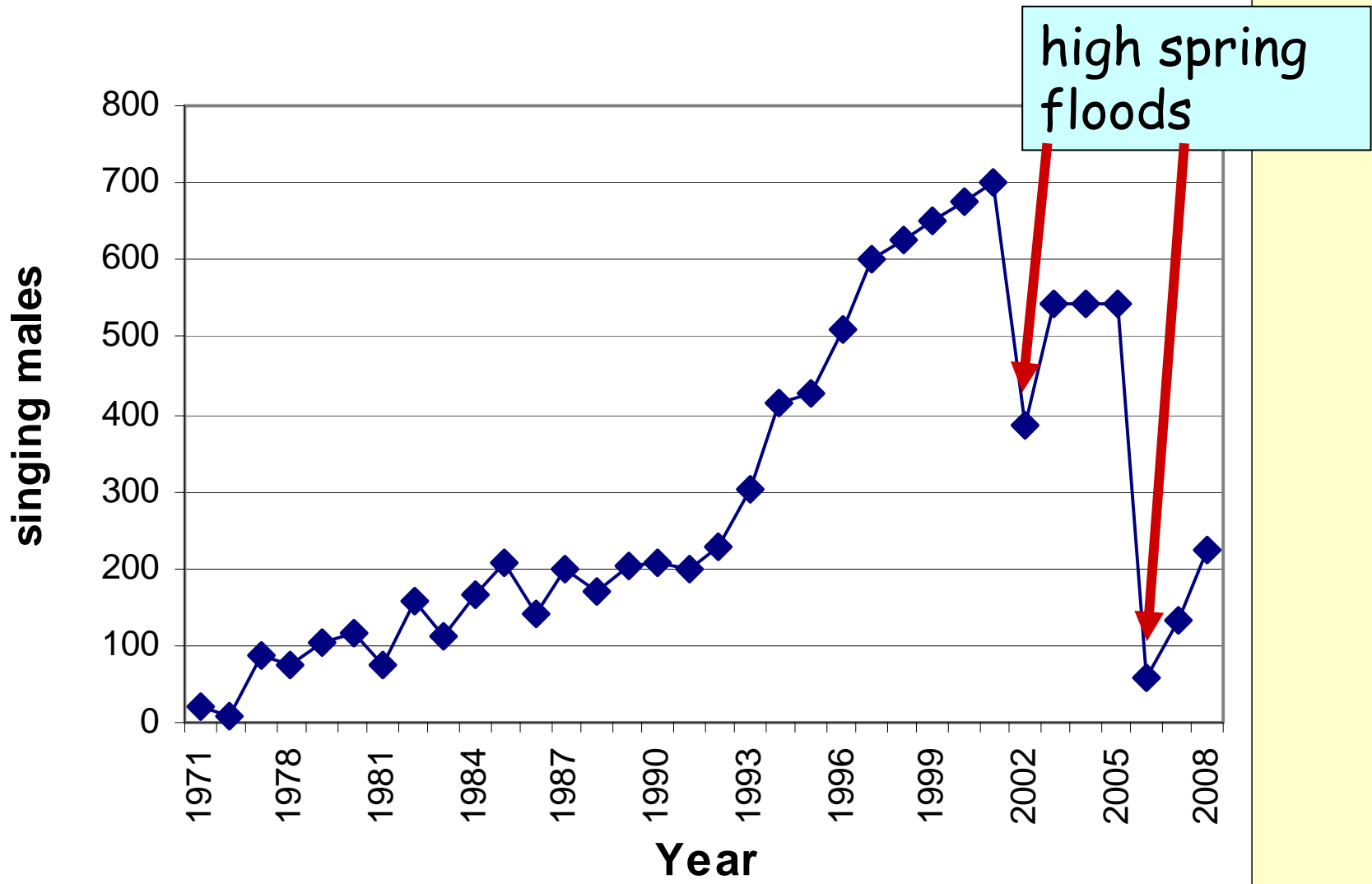


Dreverna (Lithuania), June 2004

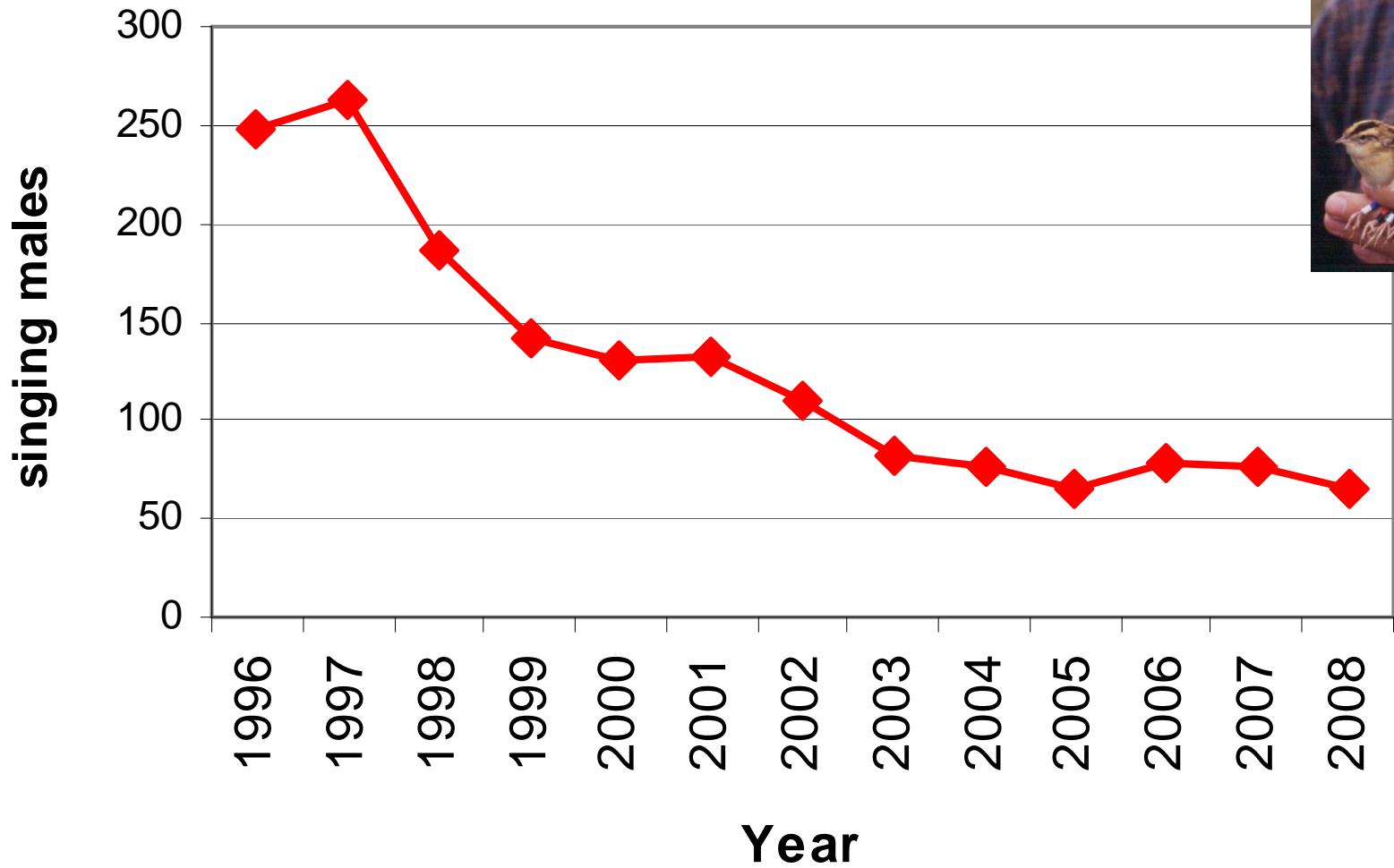
Current major threats to the central-European AW population:

- River bed deepening at the upper Ukrainian Pripyat
- to early mowing of polder meadows at the Lithuanian Nemunas delta
- Vegetation succession of fen mires speeds up

Aquatic Warbler: population development in Hungary 1971-2008

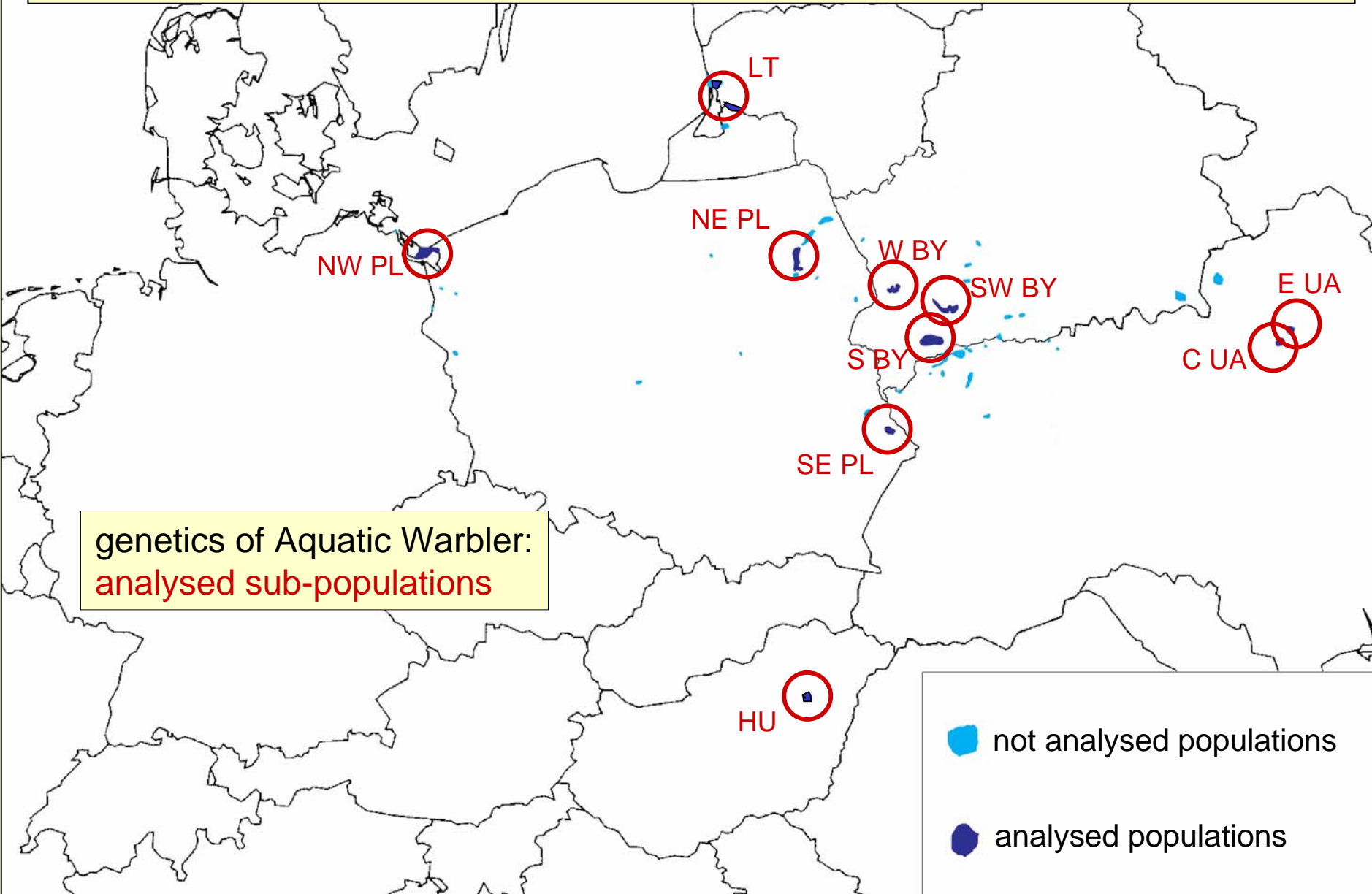


Aquatic Warbler: development of the Pomeranian population 1996-2008



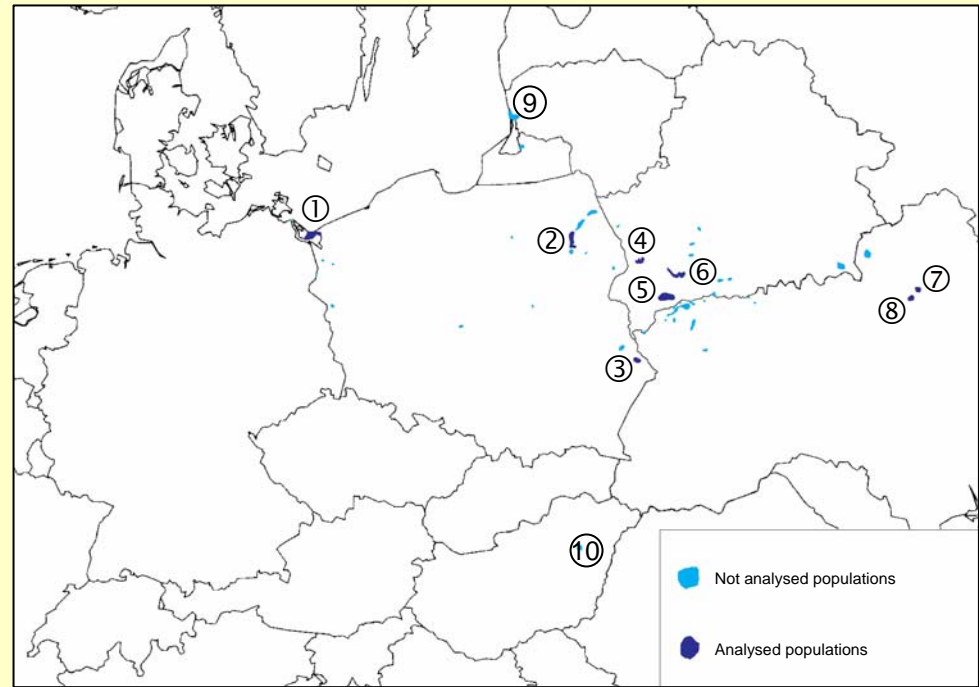
Population genetic analysis of the Aquatic Warbler

Benedikt Gießing



Origin and number of analysed samples:

No., site name	coordinates	n =
1. Stettin/PL	53.51° N, 14.19° E	47
2. Biebrza/PL	53.20° N, 22.40° E	72
3. Chelm marshes/PL	51.08° N, 23.40° E	30
4. Dikoe/BY	52.44° N, 24.13° E	49
5. Zvanets/BY	52.01° N, 24.49° E	30
6. Yaselda/BY	52.27° N, 25.01° E	27
7. Uday/UA	50.52° N, 32.07° E	25
8. Supoy/UA	50.24° N, 31.45° E	25
9. Nemunas delta/LT	55.24° N, 21.23° E	9
10. Hortobágy/HU	47.30° N, 21.30° E	11
- Veurne/B	51.04° N, 0.20° E	78
- La Nava/E	42.05° N, 0.48° W	49
total:		450



Pairwise F_{ST} differences:

F_{ST} values above / p-values below matrix

	POMMER	NE PL	SE PL	W BY	S BY	SW BY	C UA	E UA	LT	HU
POMMER		0.016	0.004	0.002	0.010	0.010	0.005	0.015	0.031	0.020
NE PL	0.001		0.002	0.004	0.004	0.005	0.000	0.004	0.026	0.019
SE PL	0.005	0.386		0.000	0.002	0.001	0.003	0.001	0.030	0.016
W BY	0.009	0.288	0.502		0.002	0.000	0.000	0.007	0.022	0.018
S BY	0.001	0.133	0.072	0.523		0.000	0.000	0.009	0.015	0.021
SW BY	0.001	0.229	0.133	0.462	0.468		0.000	0.006	0.016	0.019
C UA	0.042	0.431	0.143	0.719	0.774	0.491		0.013	0.007	0.031
E UA	0.001	0.032	0.098	0.014	0.033	0.602	0.122		0.054	0.016
LT	0.024	0.198	0.298	0.608	0.745	0.400	0.521	0.004		0.066
HU	0.001	0.006	0.003	0.005	0.004	0.117	0.002	0.002	0.002	

Orange: p-values ≤ 0.05

Dark blue: F_{ST} values ≥ 0.02 (but only if significant on $p \leq 0.05$ level)

light blue: F_{ST} values ≥ 0.01 (but only if significant on $p \leq 0.05$ level)

Genetic differentiation and gene flow:

There is only a slight differentiation between subpopulations, but probably a declining rate of gene flow:

for Pomerania significant (gene flow disconnected), probably also for Hungary and Lithuania

There are signs of inbreeding depression in the Pomeranian and Lublin subpopulations (increased occurrence of homozygosity).



Aquatic Warbler

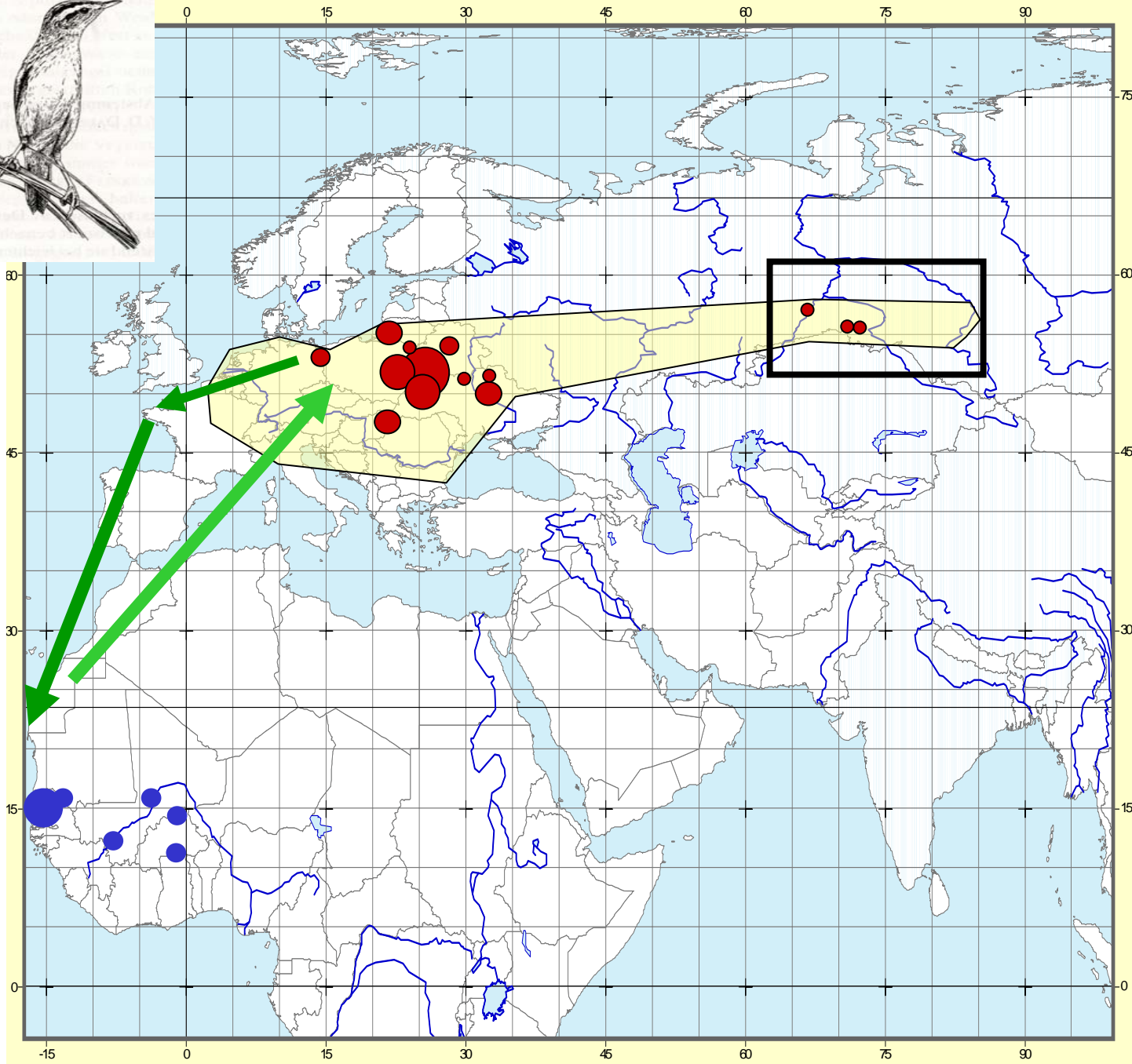


Global range

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- former range
- migration





Shegarka mire, Ob floodplain near Tomsk, June 1999



Shegarka: Hundreds of singing Aquatic Warblers in 1967 ??



Siberia 1999:
huge transport problems...



Tara bridge near Mezhowka



Siberia 1999:

*Very hard field conditions,
wild animals...*

Nice coffee break („I survived Vietnam“)



„Moshka very klein, but bolshoj scheisse“

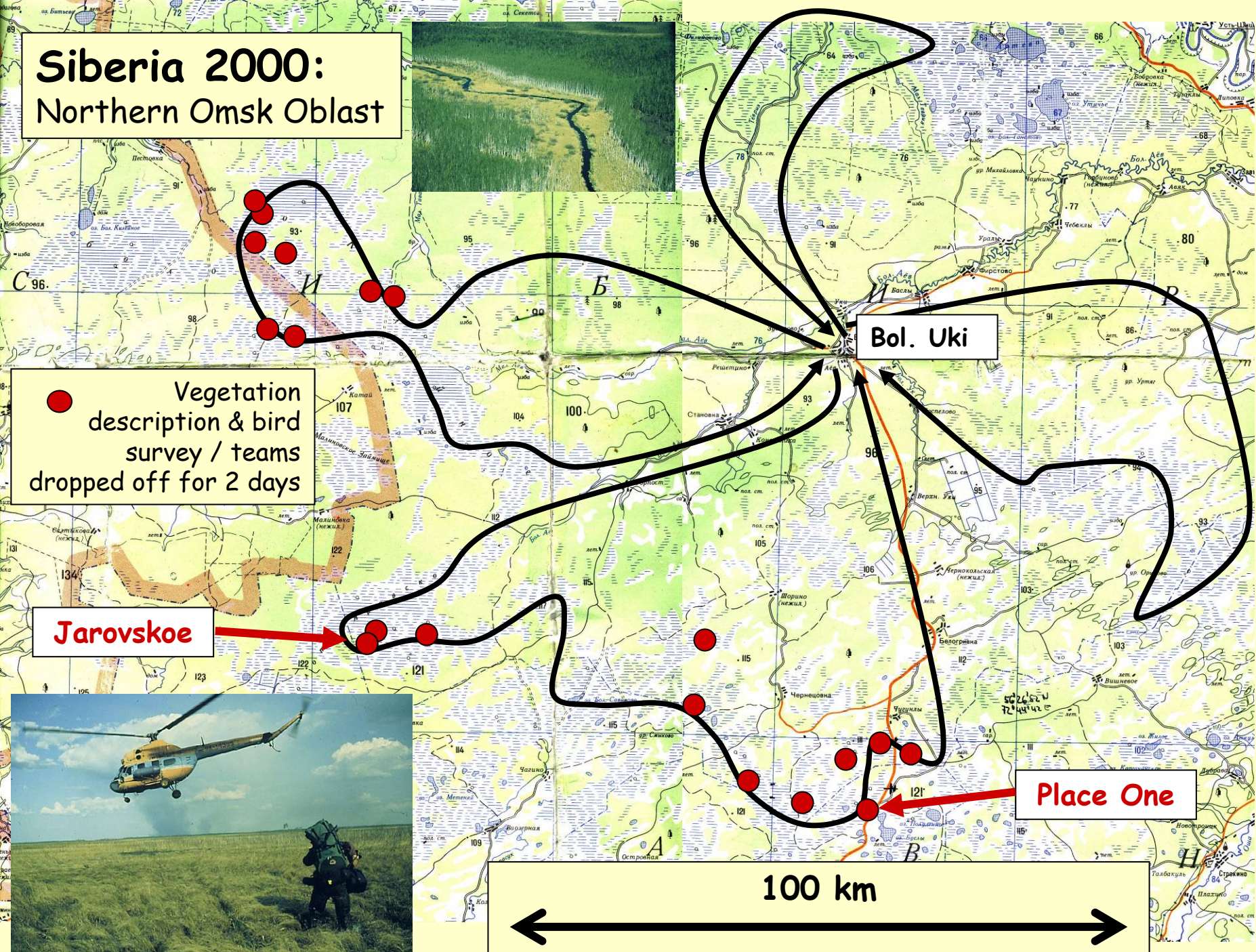


Fresh bear tracks beside the tents ...



**Most important result in 1999:
We need a helicopter!**

Siberia 2000: Northern Omsk Oblast



● Vegetation description & bird survey / teams dropped off for 2 days

Jarovskoe

Bol. Uki

Place One

100 km



,Place One' N Omsk

*First singing Aquatic Warbler in W-Siberia,
22nd of May, 2000*





Birch group ,Hotel Aureola'



Jarovskoe, 25 May 2000



North of
Tyumen'

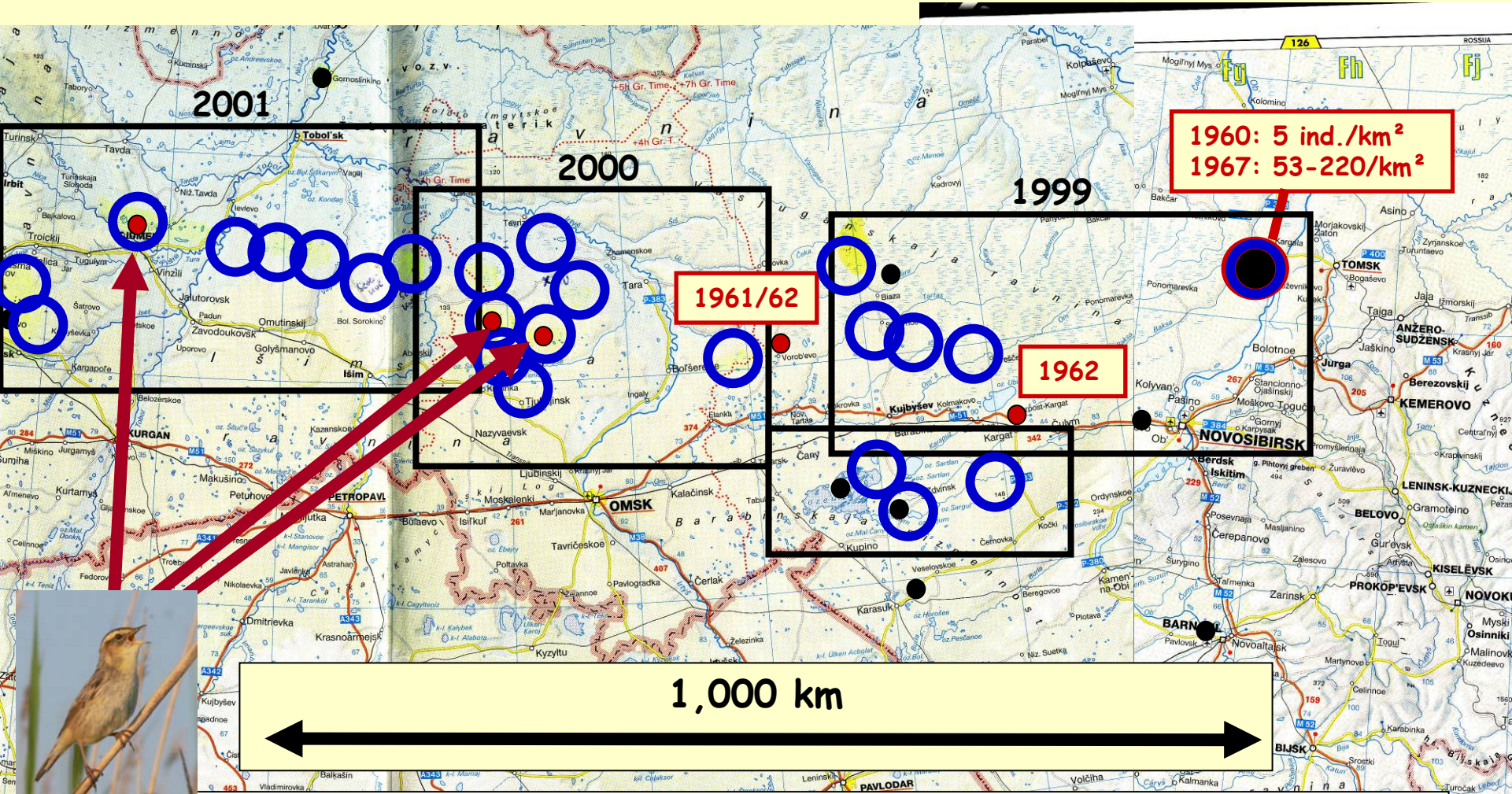


*up to 8 singing
Aquatic Warblers
June/July 2000*

(Konstantin Grashdan)

7 km north of
Lake Busly





SW-Siberian plain between Ural and middle Ob

Southern Taiga and Forest Steppe zone

- unconfirmed historical AW records
- confirmed AW records
- mires surveyed by AWCT 1999-2001

The secret of Aquatic Warbler occurrence in W-Siberia

- tremendous drainage campaigns in central Europe/Russia starting in the 1950s
- concentration of reliable breeding records in W-Siberia in the 1960s
- increased occurrence of AW on migration in the E-Mediterranean 1958-66
- occupation of sites in W-Siberia extremely discontinuous, despite huge areas of suitable habitats
- song, biometric measurements and genetics of Siberian AW are not different.



The 'Exodus Hypothesis':

The strong occurrence of AW in W-Siberia in the 1950s/60s and recent disappearance was the result of a big exodus from central and eastern Europe to the east, initiated through large-scale drainage campaigns in the 1950s.

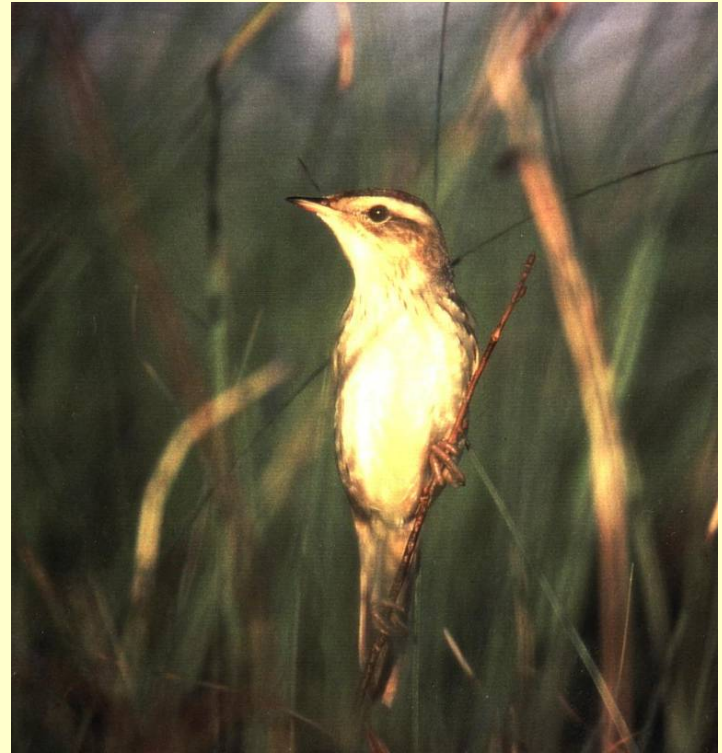
Summary:

Current status of the globally threatened Aquatic Warbler

- **Dramatic decline** of population size and range during the 20th century;
- Regular breeding occurrence at less than **40 sites in 6 countries only**;
- area of occupied habitat in Europe is **< 1000 km²** (30 x 30 km) in total;
- **90 % of the global population is concentrated to Polessye and E-Poland** (50,000 km²), **>50 % is concentrated in Belarus**, up to 40 % in one single mire.
- The isolated and genetically distinct and/or disconnected populations in **Pomerania and W-Siberia are critically endangered**.

**→ ,partial extinction' =
loss of genetic variability**

- **Only one important wintering site** (Djoudj area) known so far (2008).



Thanks for support to

Royal Society for the Protection of Birds (RSPB)

Deutsche Ornithologen-Gesellschaft (DO-G)

Naturschutzbund Deutschland (NABU)

Sekretariat of the Bonn Convention (CMS)

BirdLife Belarus (APB)

and

The members of the Aquatic Warbler Conservation Team,

especially:

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