Can commercial reed cutting coexist with biodiversity protection? A case study from Rozwarowo Marshes, Poland

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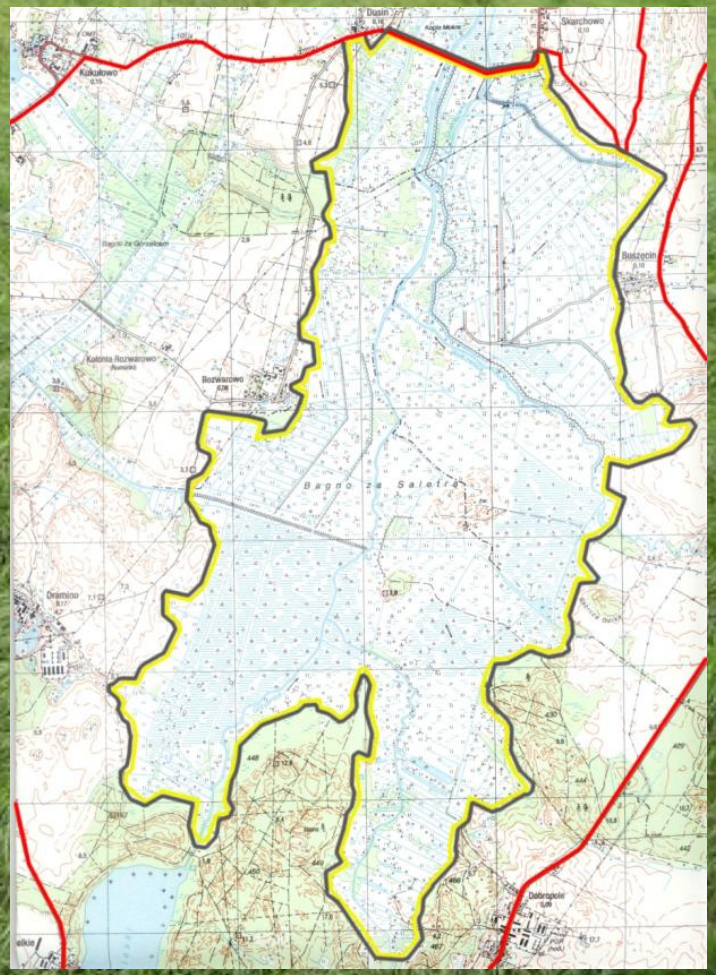
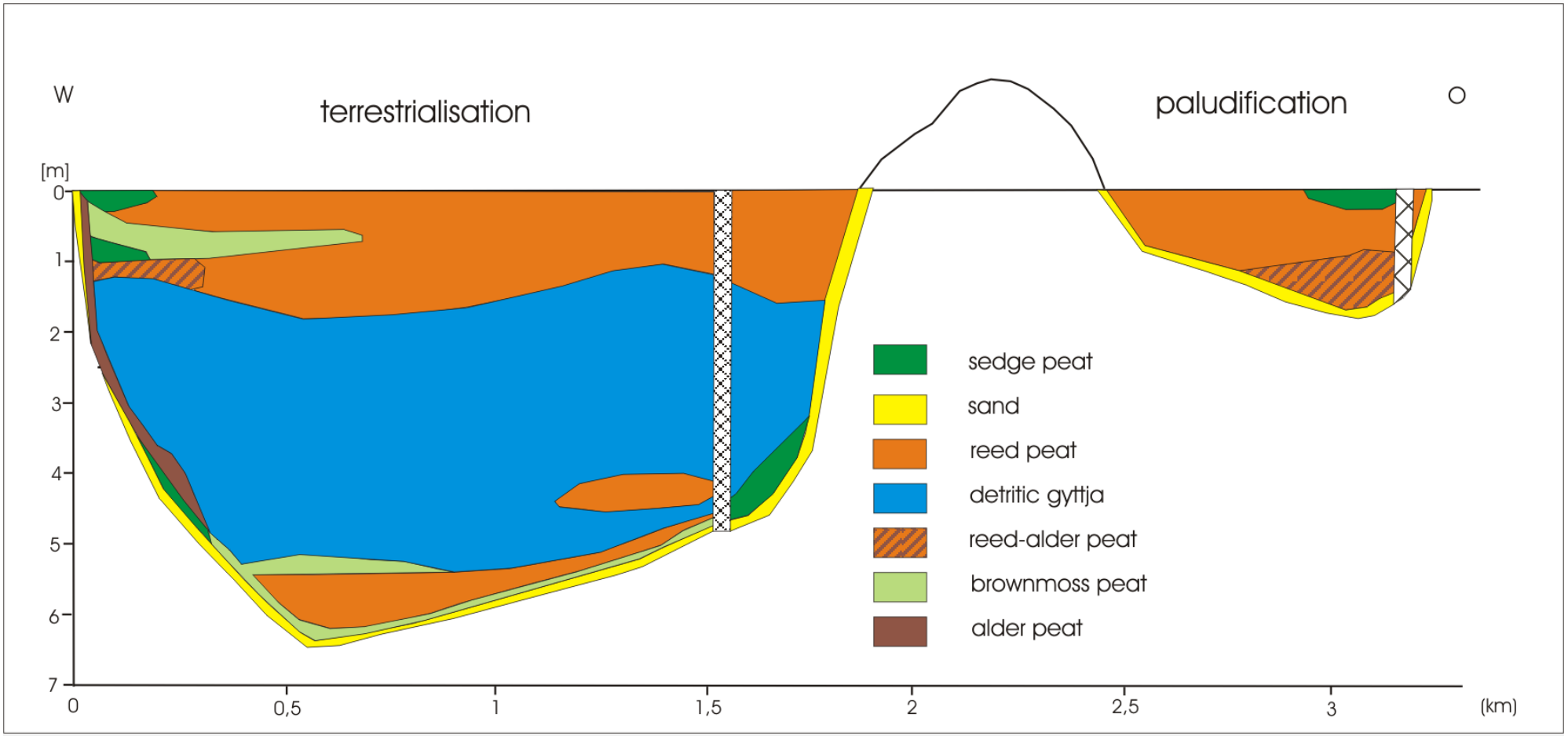
Rozwarowo Marshes

- 15 km off the Baltic coast



- 1,700 ha
- valleys of Grzybnica and Wolczenica rivers
- never intensively drained
- Natura2000 site
- 5 large landowners (3 private)

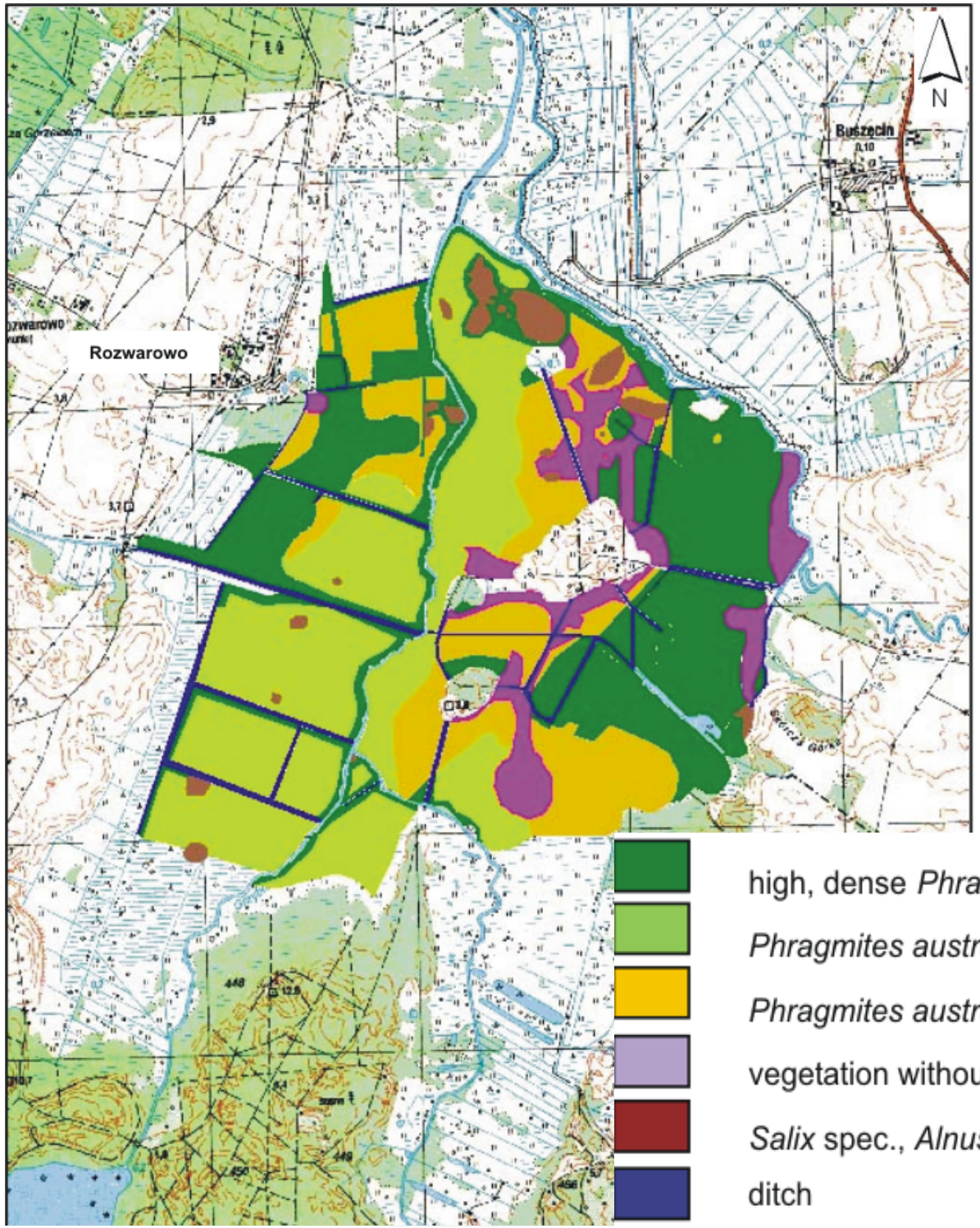
Origin



- Glacial basin filled up with basal peats, lake sediments and mainly reed peat

Tegetmeyer et al. 2007

Vegetation

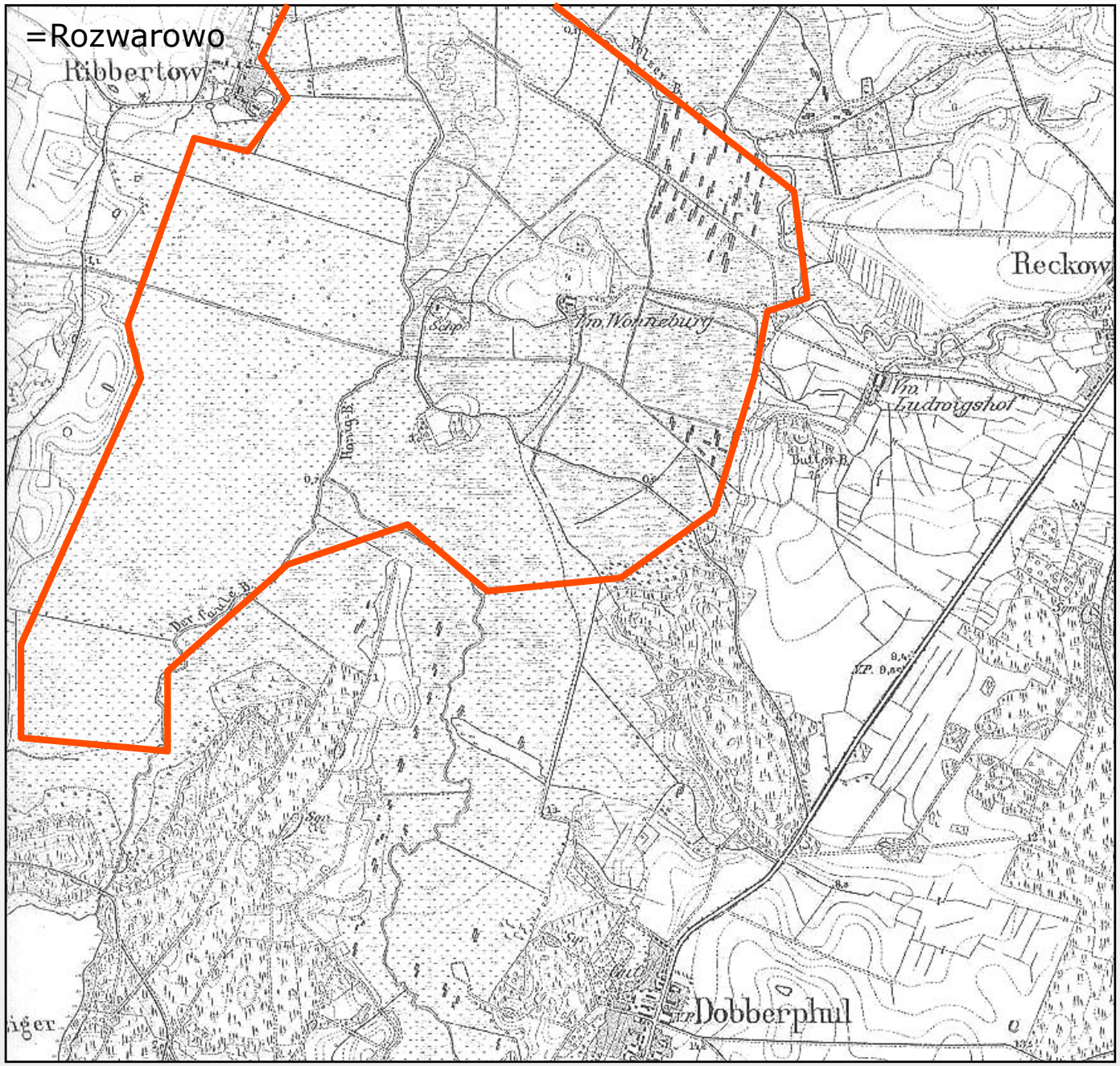


Tegetmeyer et al. 2007

- high, dense *Phragmites australis* stocks (type 1)
- *Phragmites australis* stocks with *Thelypteris palustris* (type 2)
- *Phragmites australis* stocks with sedges (*Carex* spec.) (type 3)
- vegetation without *Phragmites australis* (type 4)
- *Salix* spec., *Alnus glutinosa*
- ditch

Land use history

- before 1945: agricultural use, some peat extraction
- 1945 bis 1989: no land use
- since 1989: harvesting of reed mainly for thatching (partially for fuel)



(Königl. Preußische Landesaufnahme 1886)

Reed cutting for thatching in NW Poland

- until 1980: large cooperative in Police producing building materials from reed (~ 3,000 ha)
- 1980-1988: strong decrease (politics)
- 1988: first private company
- today: 8 companies (~2,000 ha)
- thatch sold to DK (50%), PL (20%), DE (10%), FR, NL and S

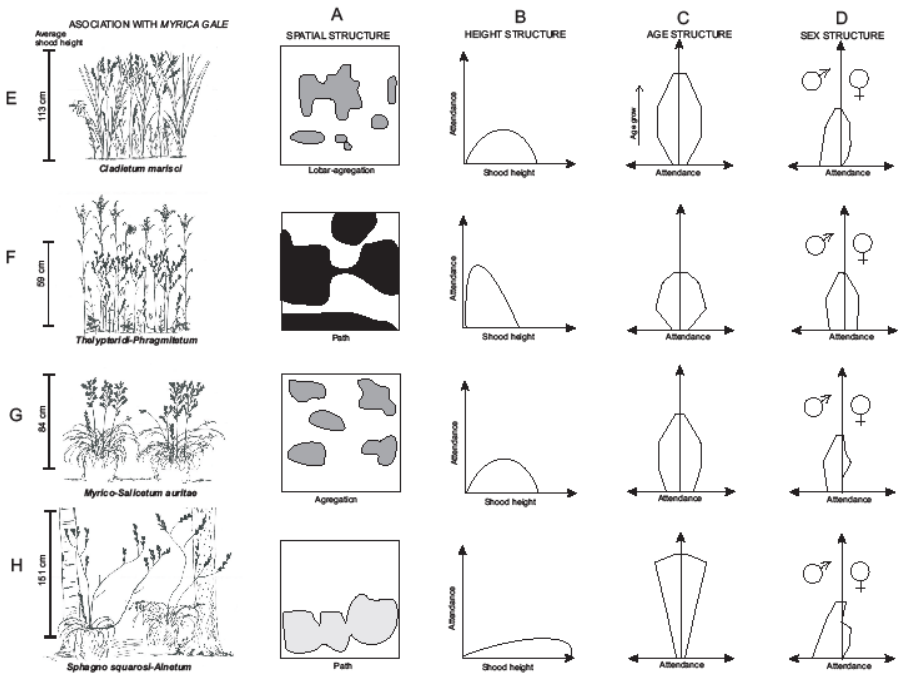
Biodiversity values

Priority N2000 habitats
7210*
91E0*

Myrica gale
Carex pulicaris
Halophytes (*Plantago maritima, Triglochin maritimum, Junus gerardii*)

Gallinago media (? 2-6 displ.)
*Crex crex (*15 males)
*Botaurus stellaris (*3 males)

Myrica gale



- largest population in NW Poland, edge of geographic range

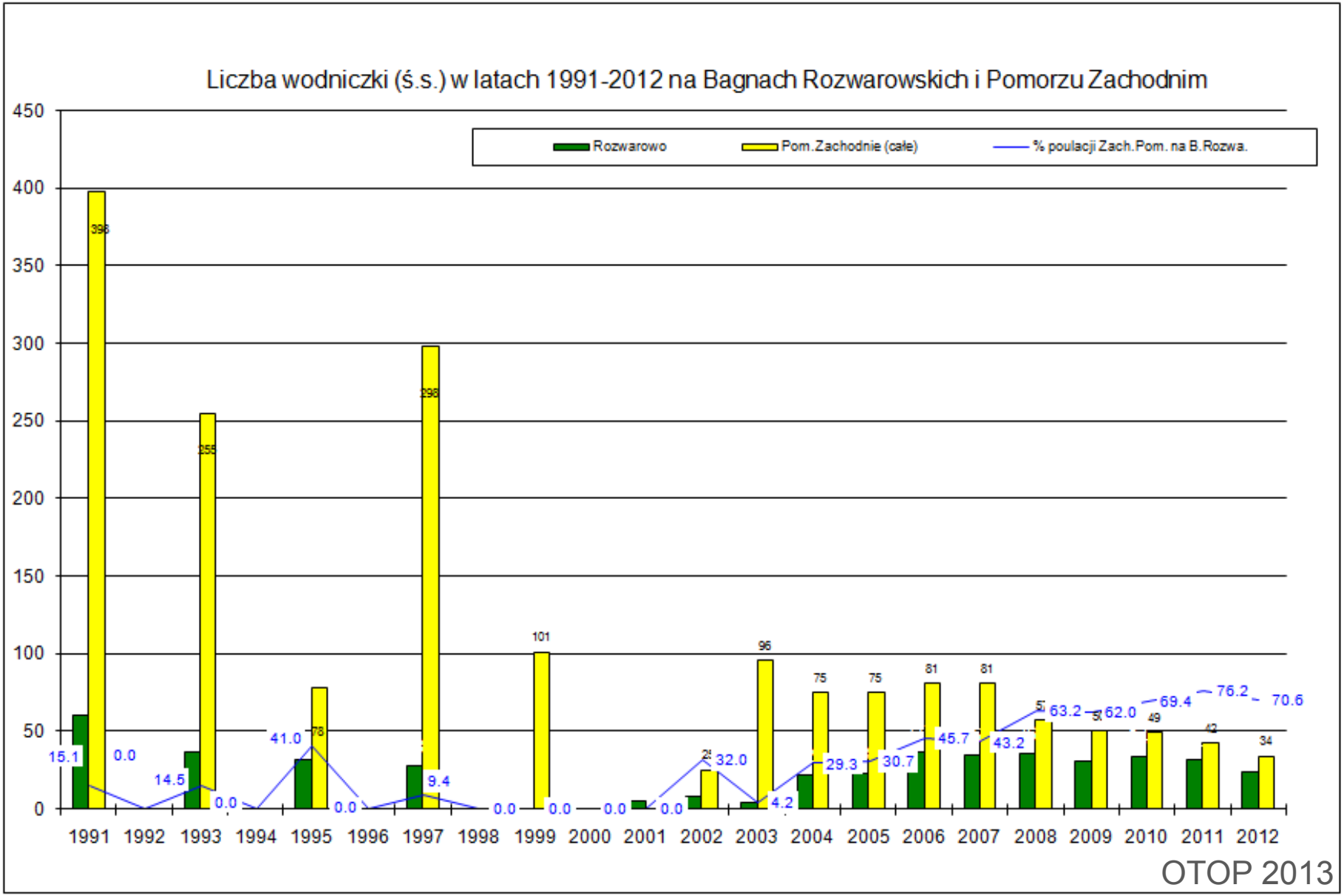
Jurzyk 2004

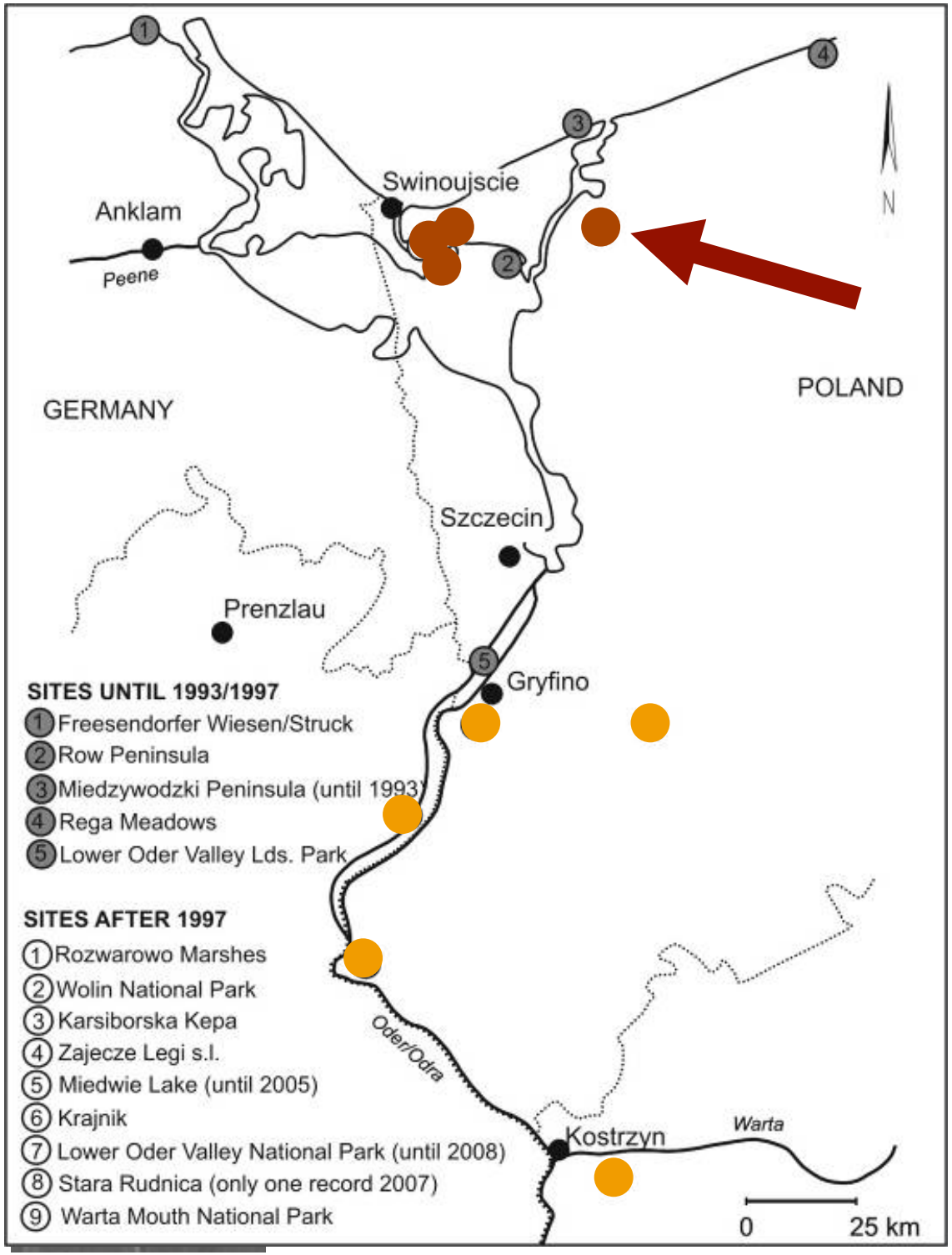
Fotos: Sylwia Jurzyk-Nordlöw

The Aquatic Warbler (Acrocephalus paludicola)

- ~1900 one of the most widespread birds in European fen mires
- now the only globally threatened passerine species of continental Europe

The Pomeranian and the Rozwarowo population





Coastal and small river valley sites

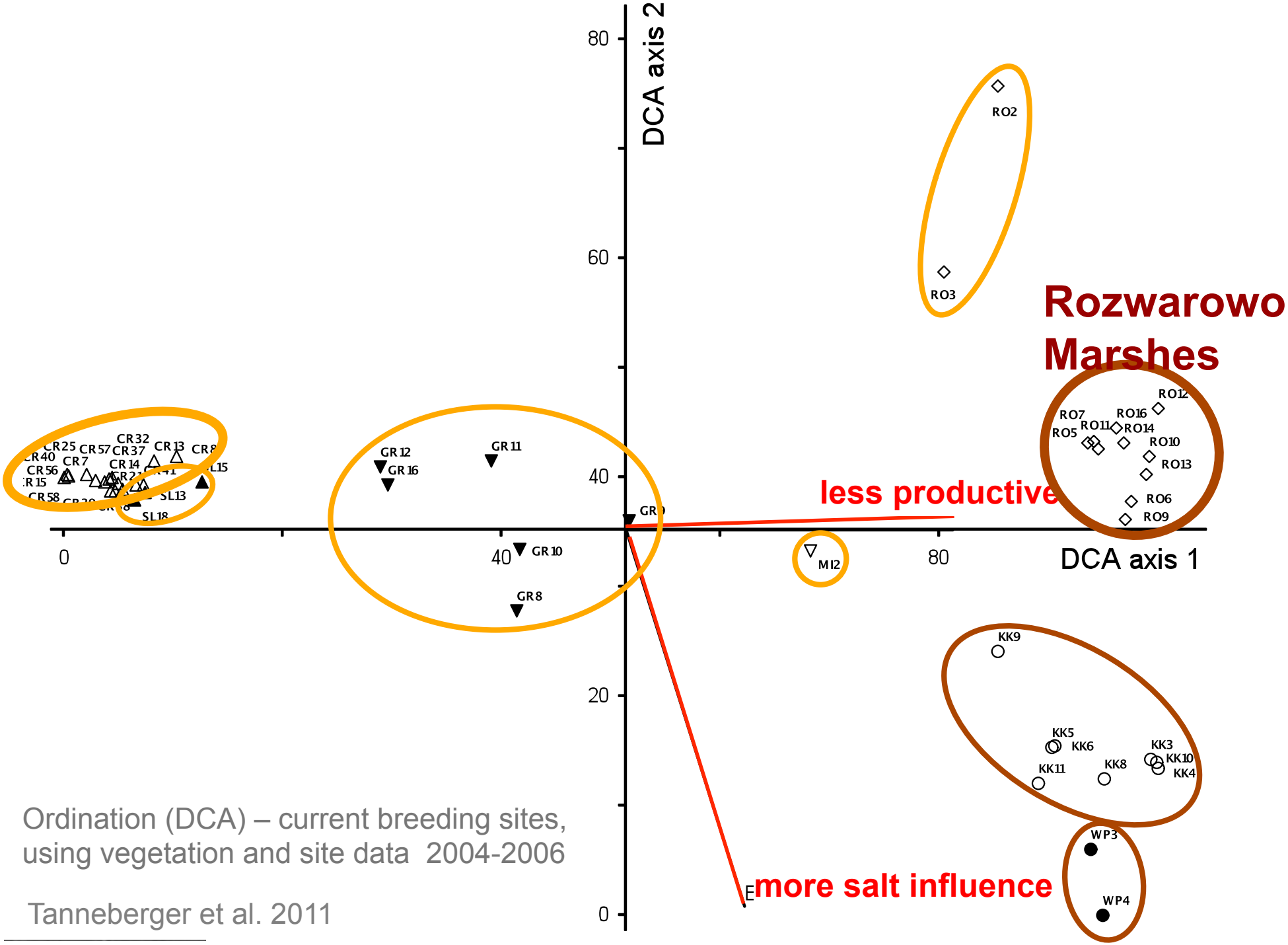
slightly eutrophic (soil C/N 15-19)

Lower Oder valley sites

strongly eutrophic (soil C/N 10-13)

Tanneberger et al. 2011

Plant communities



Ordination (DCA) – current breeding sites, using vegetation and site data 2004-2006

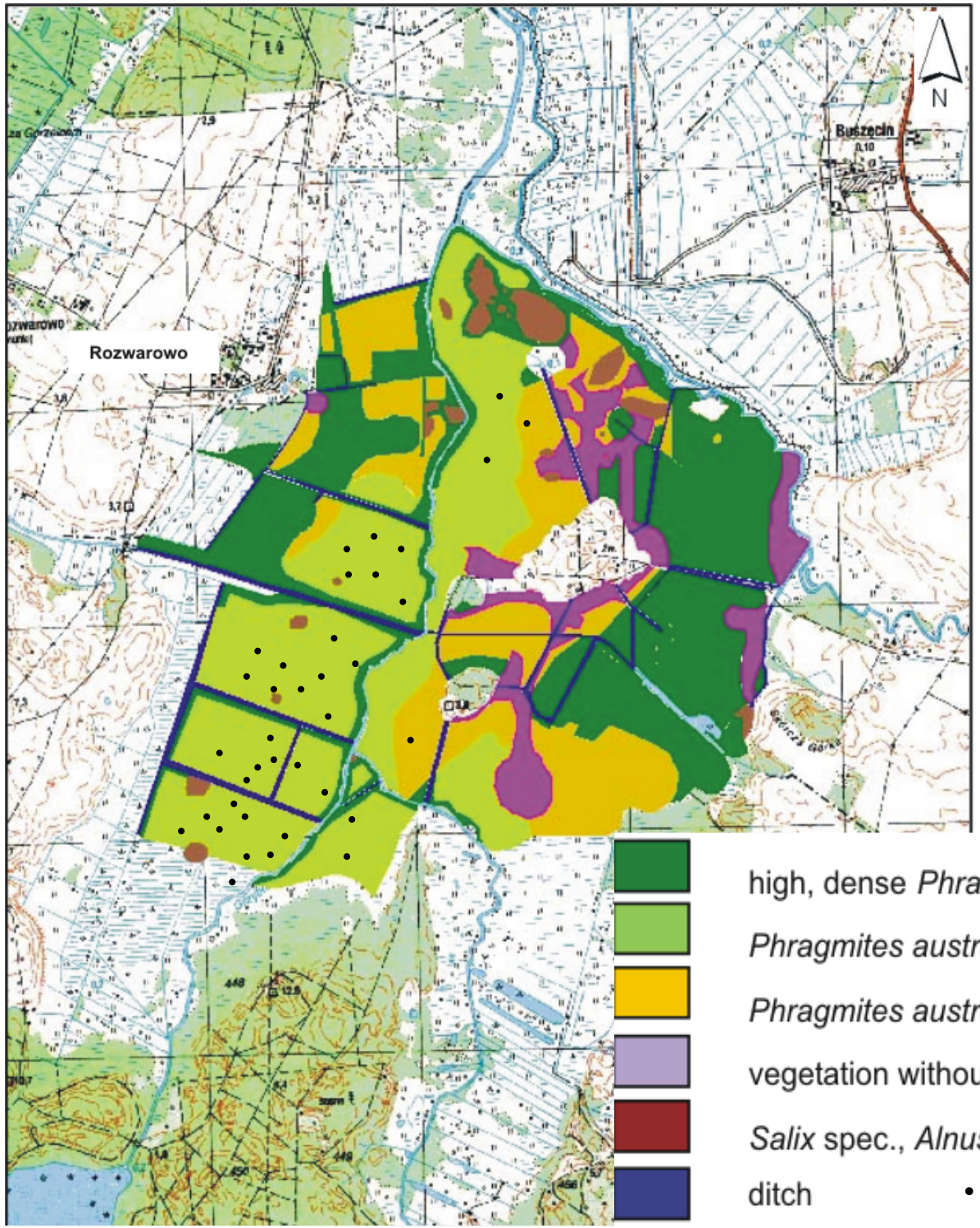
Tanneberger et al. 2011

Vegetation structure – Rozwarowo Marshes

Sparse, low reed with sedges, ferns and mosses (2+3)

Dense, high and dominant reed (1)

Vegetation



Types 2+3:

- cover large areas
- main area of current Aquatic Warbler occurrence

Tegetmeyer et al. 2007

high, dense *Phragmites australis* stocks (type 1)

Phragmites australis stocks with *Thelypteris palustris* (type 2)

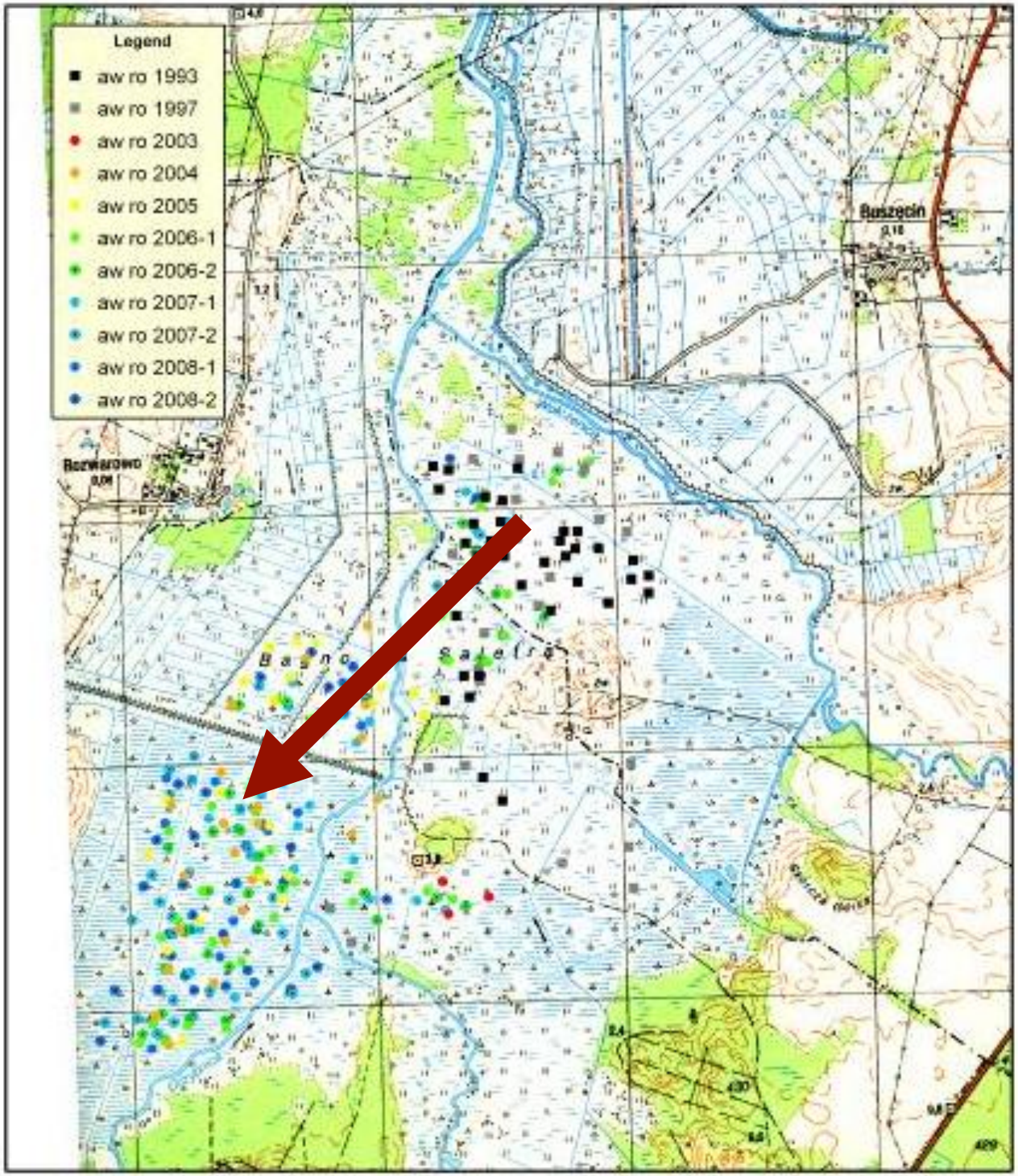
Phragmites australis stocks with sedges (*Carex* spec.) (type 3)

vegetation without *Phragmites australis* (type 4)

Salix spec., *Alnus glutinosa*

ditch

- Aquatic Warbler singing male in June 2008



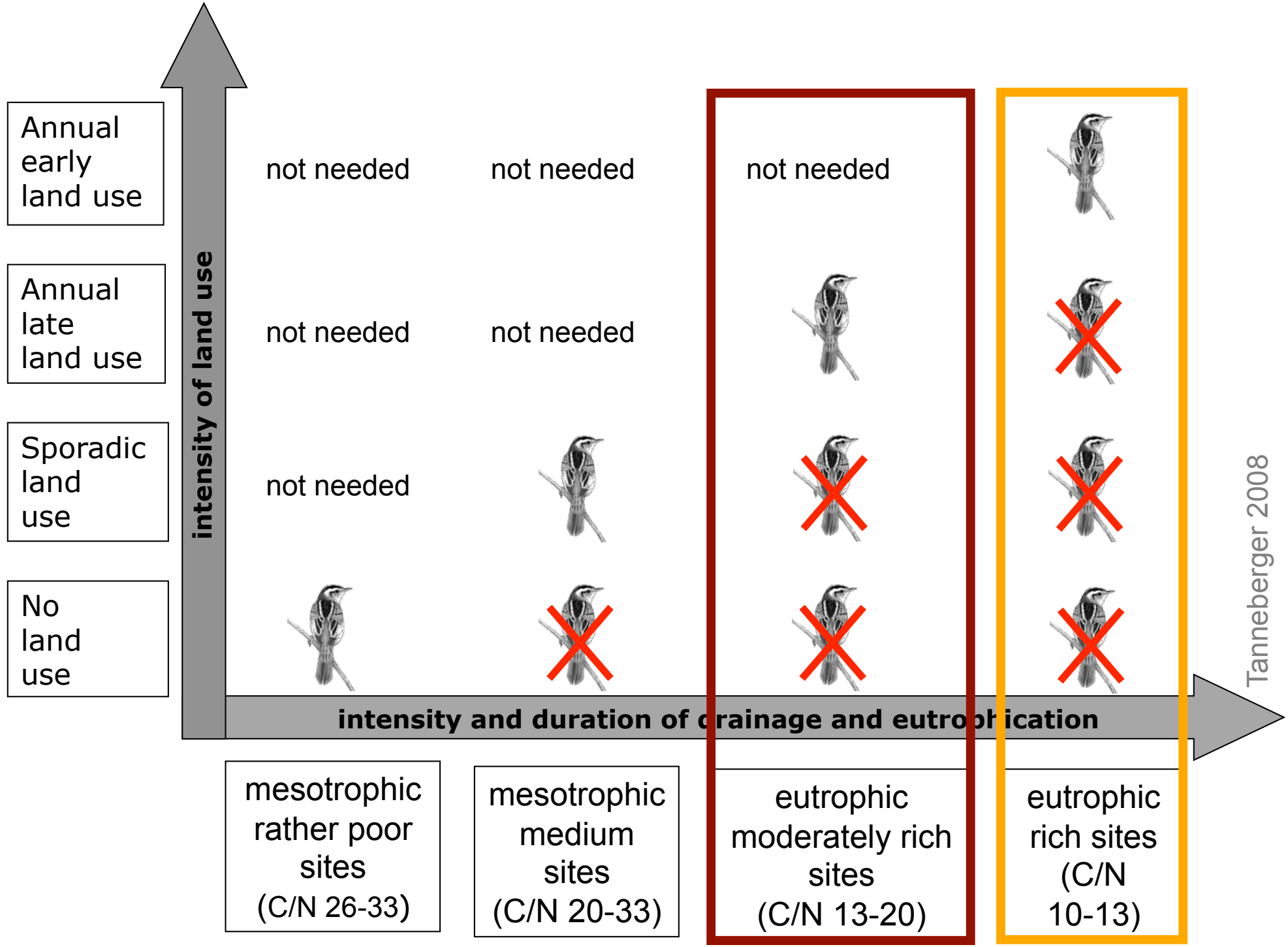
Shifting Aquatic Warbler distribution

- early 1990s: Eastern part (sedge vegetation)
- now: Western part (reed vegetation)

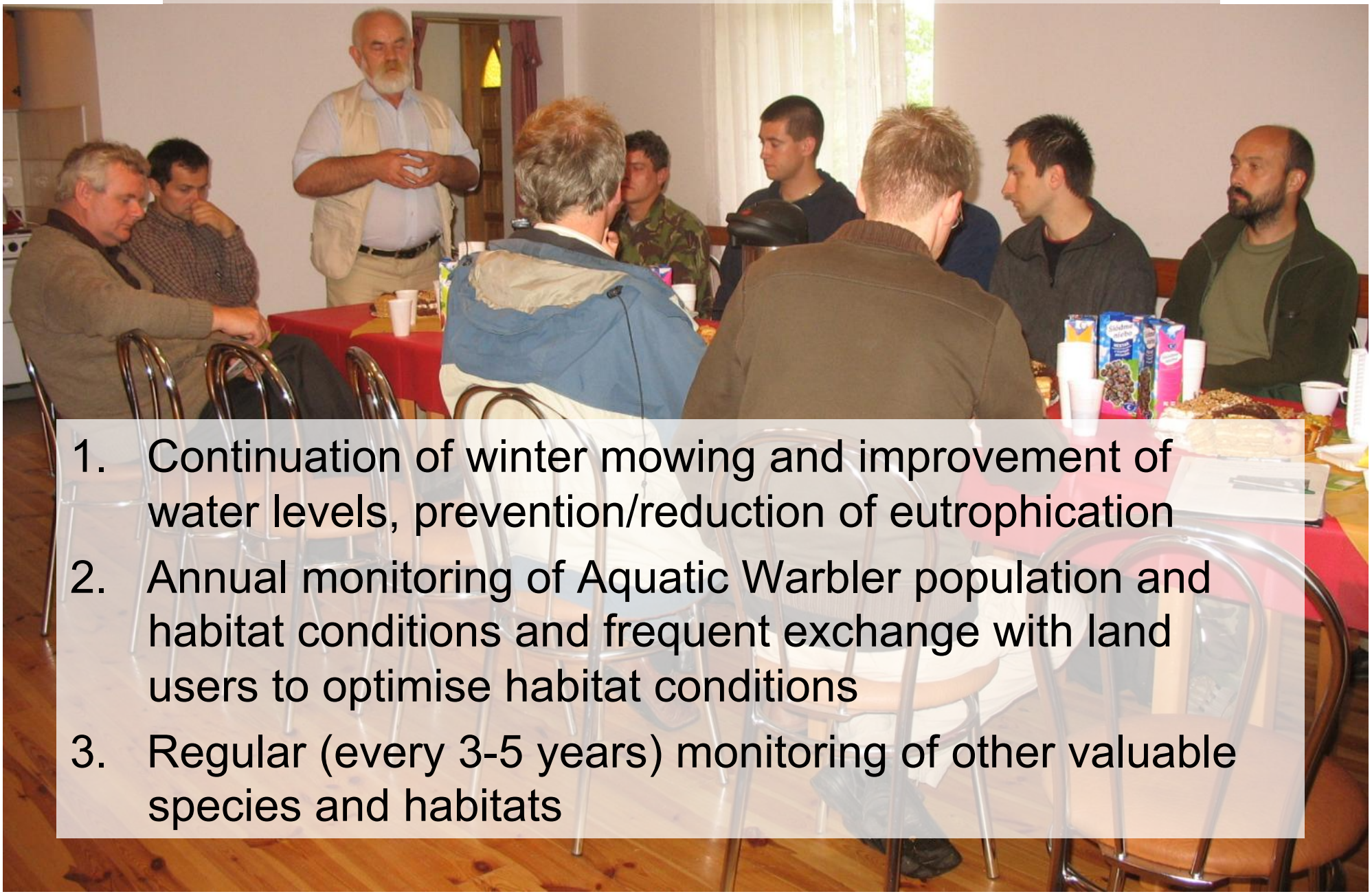
Table 4 Characteristics of reed vegetation with Aquatic Warbler (types 3 and 4), reed vegetation without Aquatic Warbler (type 5), and sedge vegetation (types 1 and 2) in Rozwarowo Marshes in July 2005

Dominant plant species	Reed	Reed	Sedge	Test value	*P*
Aquatic Warbler Occurence	Yes	No	No		
Vegetation type	3 and 4	5	1 and 2		
Number of plots	21	10	9		
Water level above soil surface (cm)	3.21 ± 5.4^{a}	10.9 ± 11.4^{ab}	17.5 ± 10^{b}	$F_{2,37} = 10.061$	0.007
Height of the upper vegetation layer (m)	1.44 ± 0.23^{a}	1.97 ± 0.43^{b}	1.29 ± 0.19^{a}	$\chi_2^2 = 15.931$	0.007
Cover of CSR species (%)	27.19 ± 13.48^{a}	9 ± 6.5^{b}	58.56 ± 17.51^{c}	$\chi_2^2 = 23.774$	0.007
Cover of reed (%)	59.9 ± 21.3^{a}	95 ± 7.1^{b}	3.33 ± 10^{c}	$\chi_2^2 = 30.28$	0.007
Cover of mosses (%)	17.88 ± 20.6^{b}	3.2 ± 6.68^{a}	0.06 ± 0.17^{a}	$\chi_2^2 = 10.747$	0.01
Productivity proxy based on Ellenberg *N* values	5.7 ± 0.8^{a}	6.8 ± 0.2^{b}	4.2 ± 0.5^{c}	$F_{2,37} = 36.985$	0.007
Potential prey (mg/transect)[1]	683.6 ± 677.4^{a}	147.3 ± 57.3^{b}	434.8 ± 266.8^{a}	$Z = 8.554$	0.014

Tanneberger et al. 2009


Annual early land use
Annual late land use
Sporadic land use
No land use
intensity of land use
not needed
not needed
not needed
not needed
not needed
not needed
intensity and duration of drainage and eutrophication
mesotrophic rather poor sites (C/N 26-33)
mesotrophic medium sites (C/N 20-33)
eutrophic moderately rich sites (C/N 13-20)
eutrophic rich sites (C/N 10-13)
Tanneberger 2008

Priorities of the management plan (2013)



1. Continuation of winter mowing and improvement of water levels, prevention/reduction of eutrophication
2. Annual monitoring of Aquatic Warbler population and habitat conditions and frequent exchange with land users to optimise habitat conditions
3. Regular (every 3-5 years) monitoring of other valuable species and habitats

Common ‚interests' of reed cutters and Aquatic Warblers

Table 5 'Interests' of reed cutters and Aquatic Warbler in Rozwarowo Marshes with regard to site conditions

'Interest'	Reed cutters	Aquatic Warbler
Loose reed 1–2 m	+	+
Dense reed 1–2 m	+	−
Absence of reed >2 m	+	+
Herbs between reed	±	+
Mesotrophic soil conditions	+	+
Absence of shrubs and trees	+	+
Water level >10 cm	+	−
Absence of eutrophic irrigation water	+	+
Winter reed cutting	+	+

Diverging 'interests' are printed in bold. + indicates any positive interest (e.g., preference, benefit), − indicates an avoidance

→ Largely common ‚interests'

→ Aquatic Warbler conservation only possible WITH reed cutters

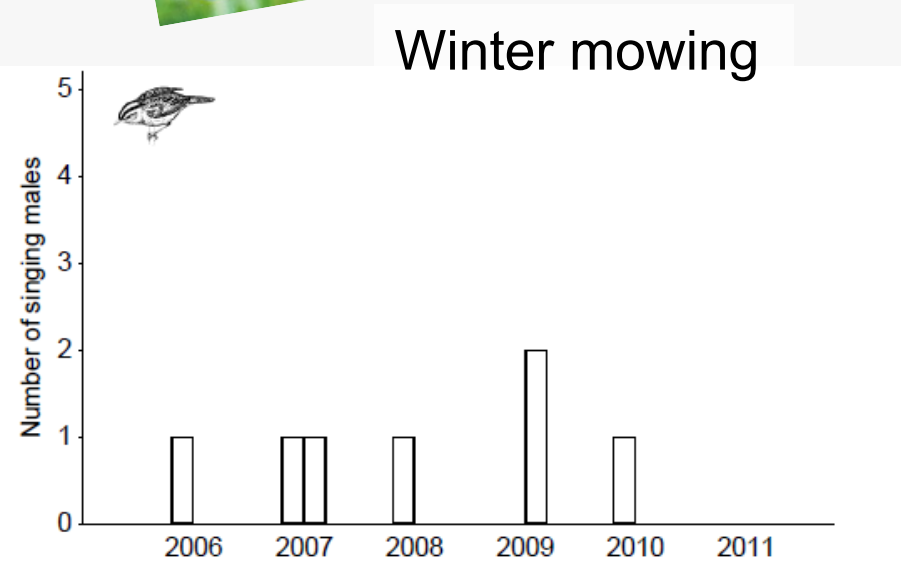
Tanneberger et al. 2009

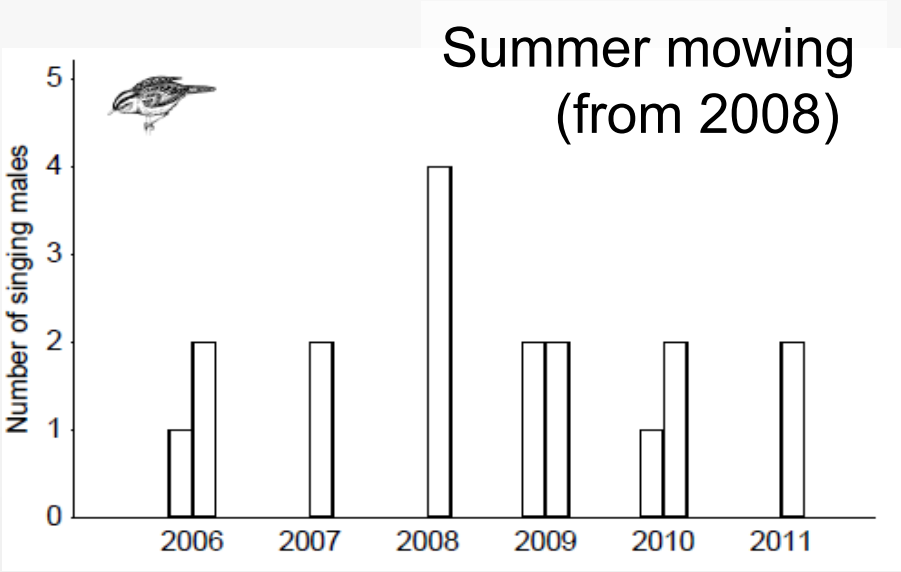

„first class“


„second class“

Winter vs. summer mowing?

Current Polish AES provide incentives for late summer mowing in important bird habitats





→ no difference re. Aquatic Warbler density and habitat quality

AES: Winter vs. summer mowing?

- summer mowing: more effective in weakening *Myrica gale* → conflict
- advantage of winter mowing is provided by the commercial use of mown reed → sustainable compromise

Many thanks – Podziękowania

… especially to the three families of reed cutters at Rozwarowo Marshes (Piątkowscy, Radny, Smpolczynscy

… and to you for your attention!