Habitat preferences of and management recommendations for the Pomeranian population

Franziska Tanneberger, Jochen Bellebaum & Martin Flade

Ernst Moritz Arndt
Universität Greifswald

Studienstiftung des deutschen Volkes

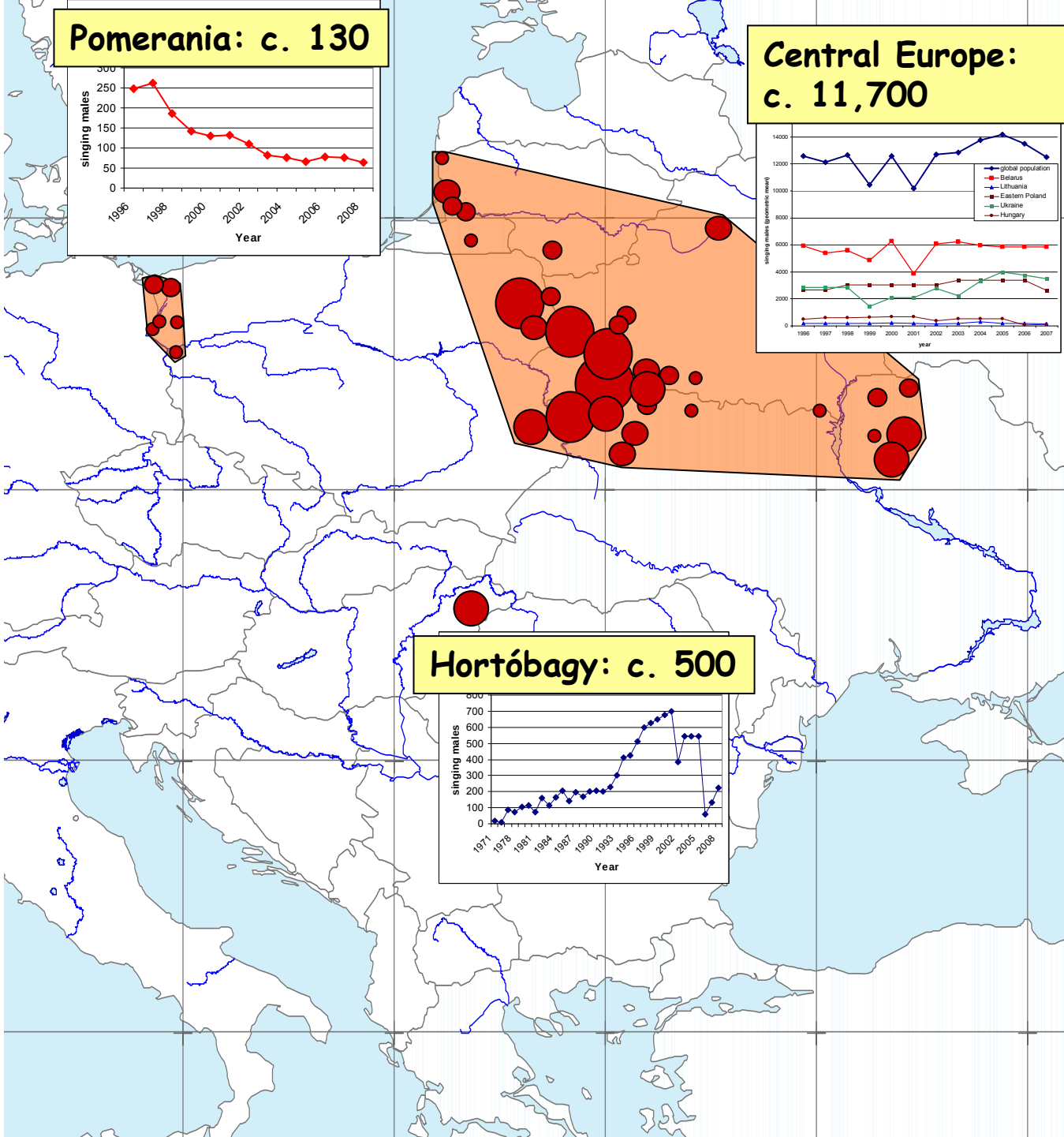
DBU

Aquatic Warbler

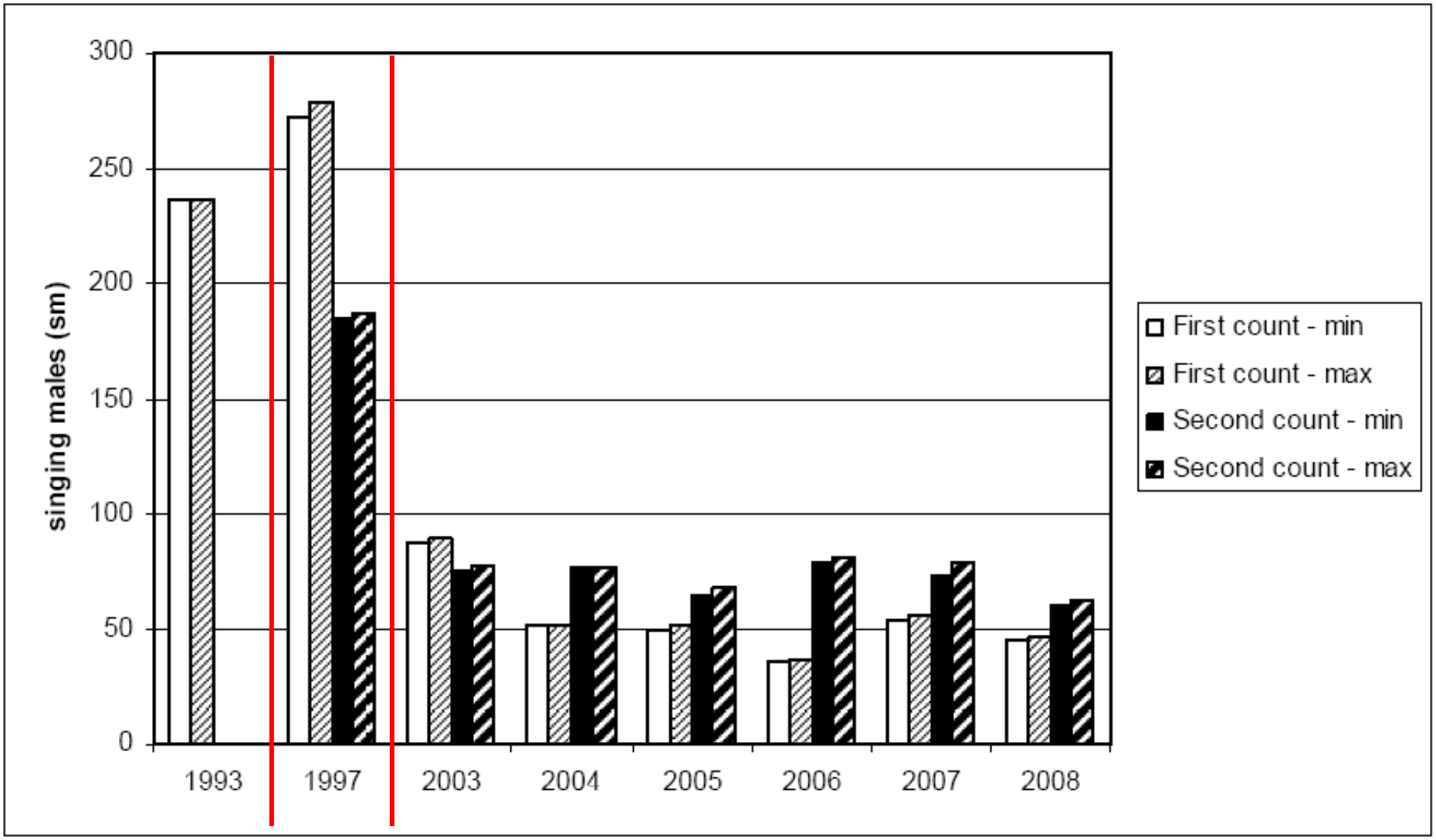
Current breeding distribution

(maximum number of singing males)

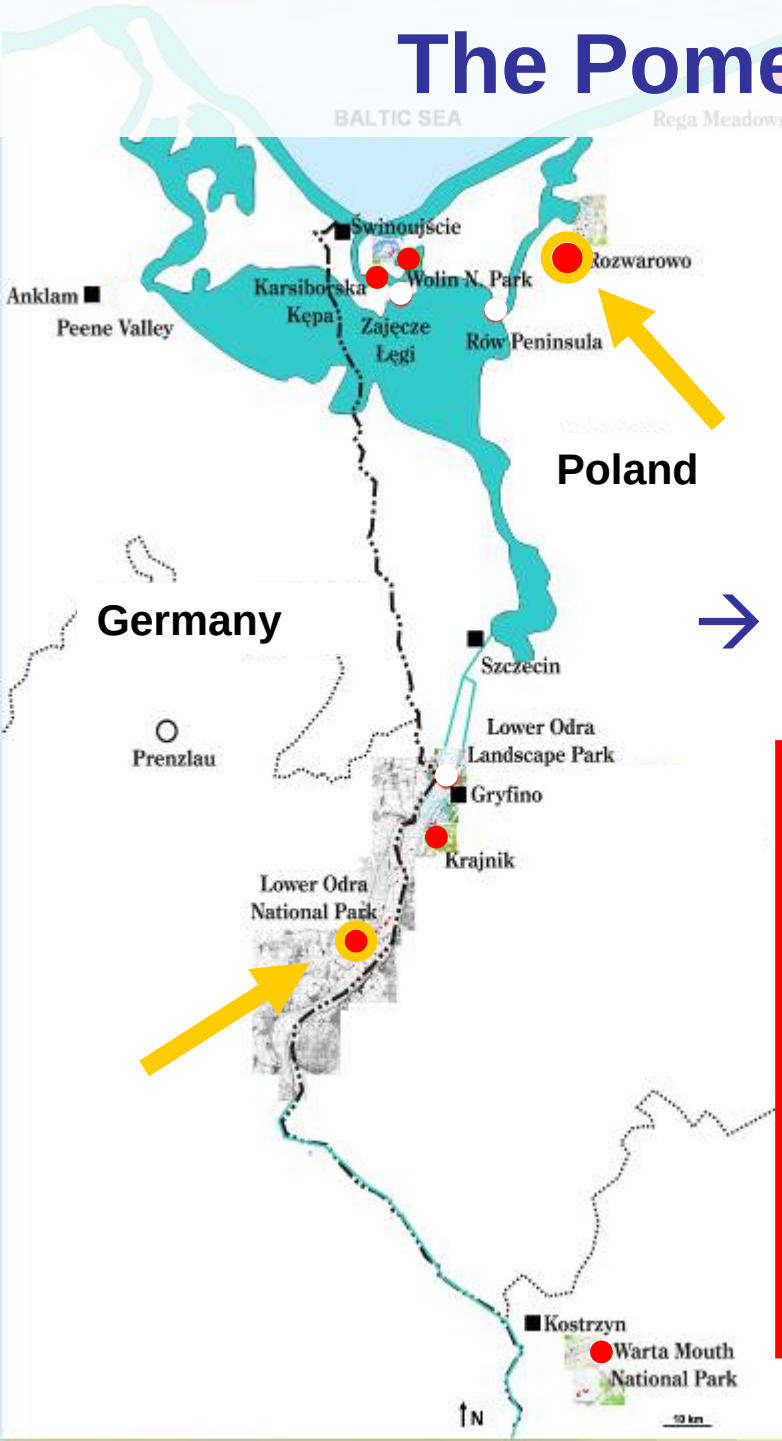
- 0-10
- 10-50
- 50-200
- 200-1000
- 1000-5000
- >5000



Population size 1993-2008



The Pomeranian Population



Differences to core population

- genetics (Giessing 2002)
- migration (Pain et al. 2004)
- song (PhD Poznan University started 2008)

→ important for intraspecific diversity

Decrease – reasons???

Study of :

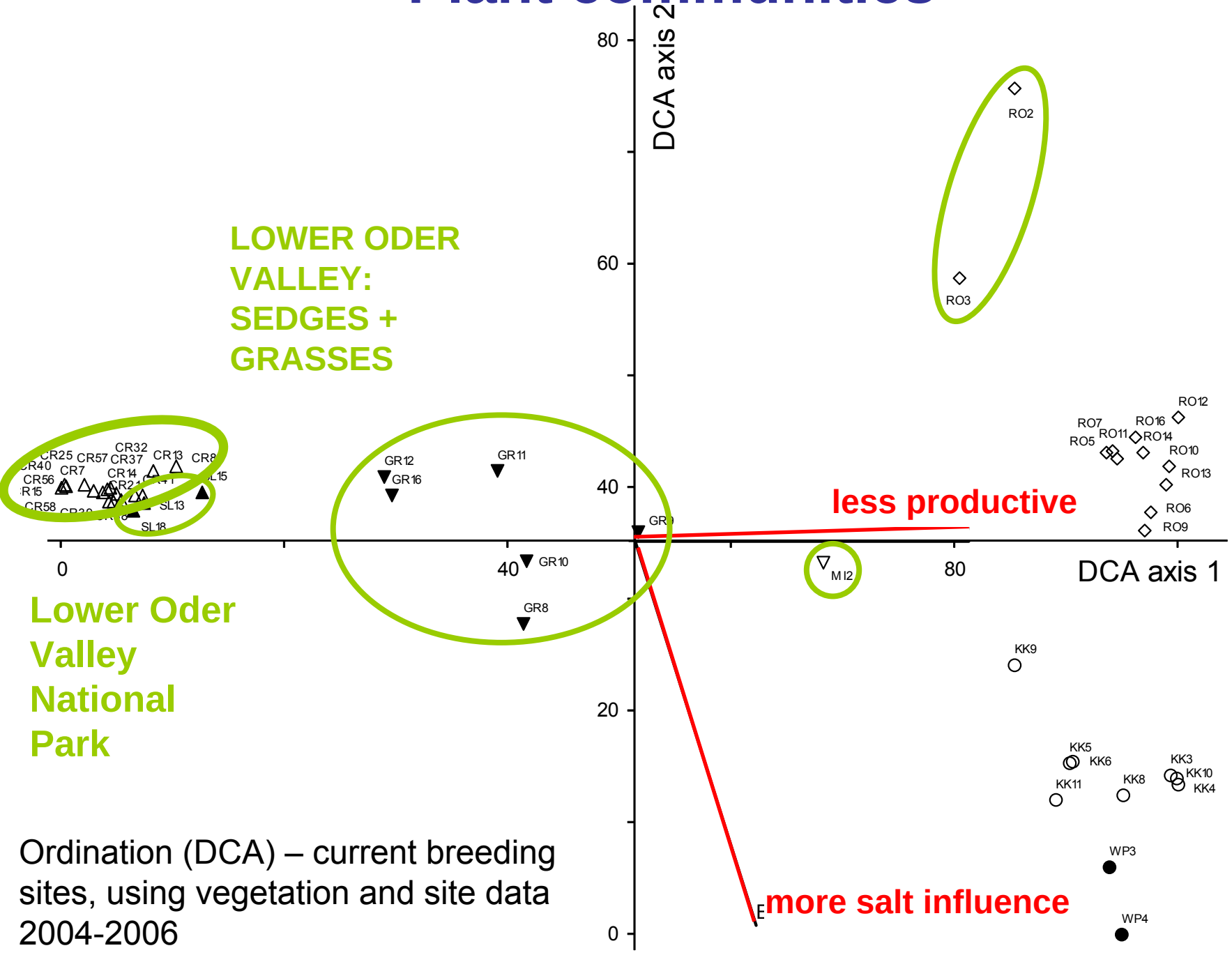
→ Plant communities

→ Vegetation structure

→ Food supply

→ Land use

Plant communities

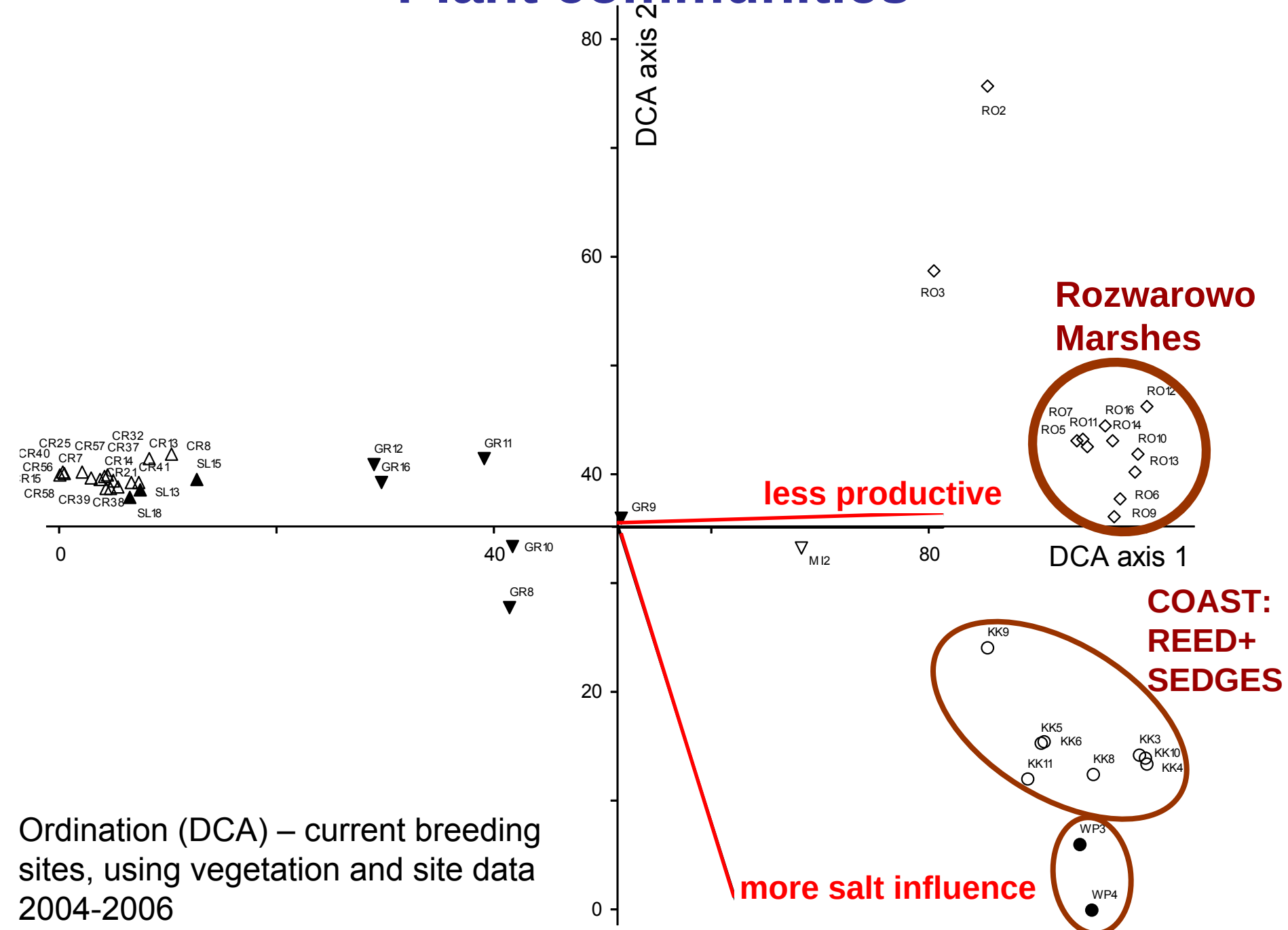


Ordination (DCA) – current breeding sites, using vegetation and site data 2004-2006

Lower Oder Valley National Park

the last breeding site in Germany

Plant communities



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

Rozwarowo Marshes

different species/communities → similar structure!

the largest Pomeranian breeding site

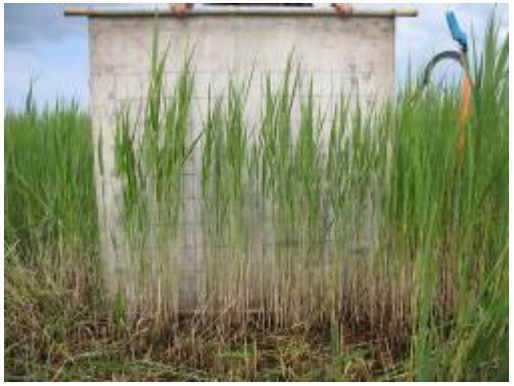
Vegetation structure

Early May	current	abandoned	test	p
Number of plots	12	15		
Mean vegetation height (cm)	65 ± 7	86 ± 8	t = 6.905	0.005
Cover of herb layer (%)	14.8 ± 10.2	2.6 ± 3.6	t = -3.969	0.005
Thickness of litter layer (cm)	4.4 ± 6.6	10.3 ± 7.3	t = 2.224	0.035
Vegetation density in 60-80 cm height (dm^3 1000 dm^{-3})	12.1 ± 11.2	35.9 ± 19.7	t = 3.861	0.005

Data: Lower Oder Valley National Park 2004-2006

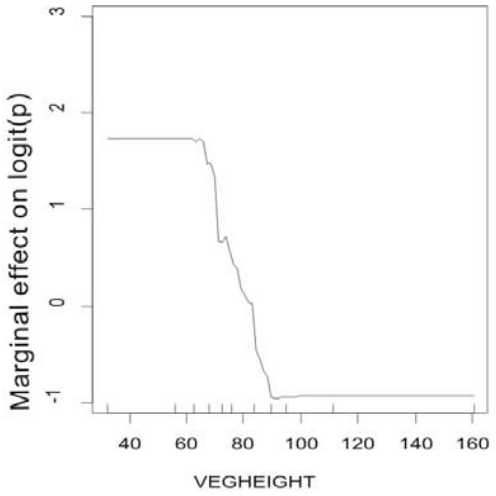
Vegetation structure

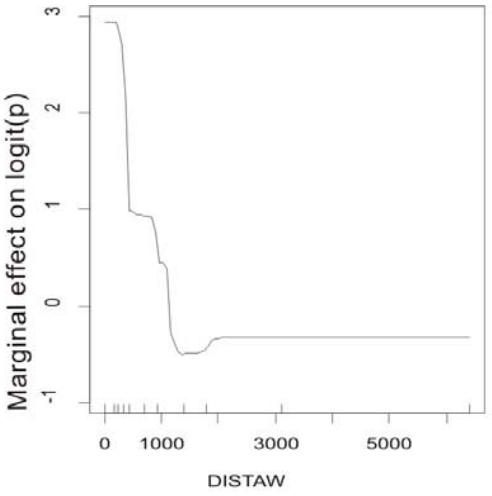
Early May	current	abandoned	test	p
Number of plots	21	20		
Mean vegetation height (cm)	64 ± 5	110 ± 8	t = 6.905	0.005
Cover of herb layer (%)	26.2 ±13.5	9 ±6.5	t = -3.969	0.005

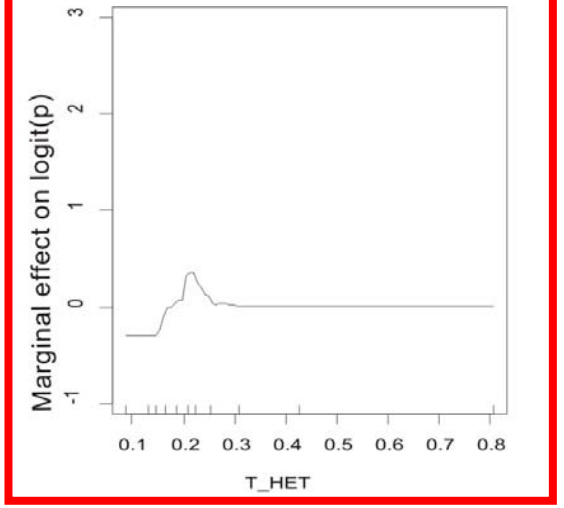


Data: Rozwarowo Marshes 2005

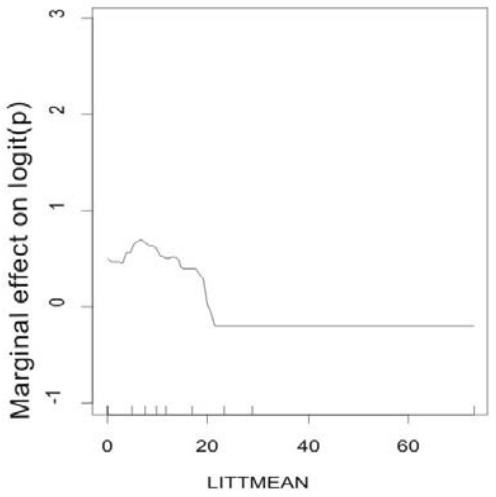
Habitat model results

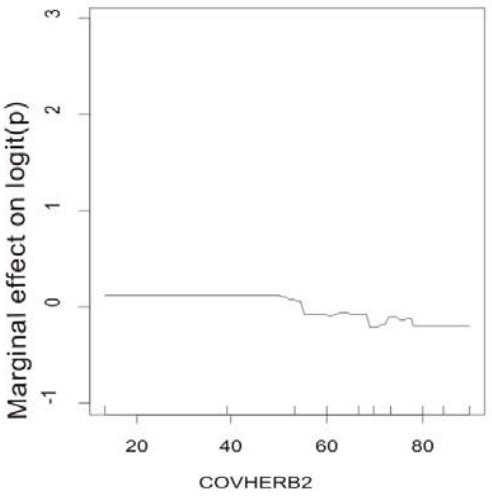


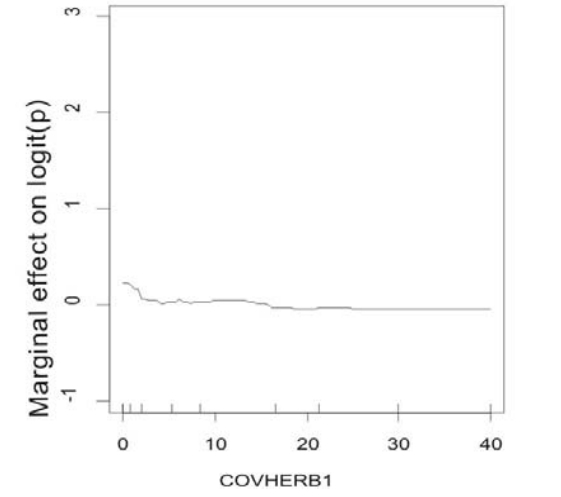




contrast to core population sites

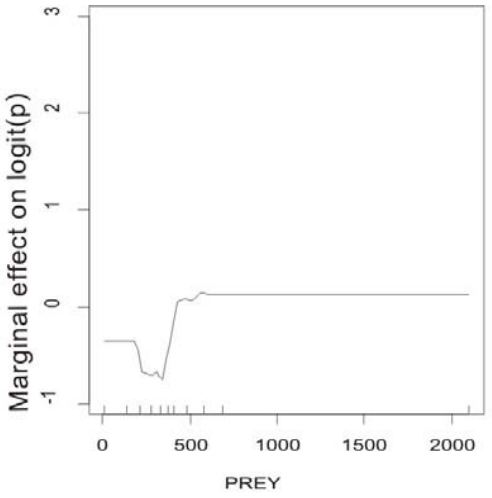






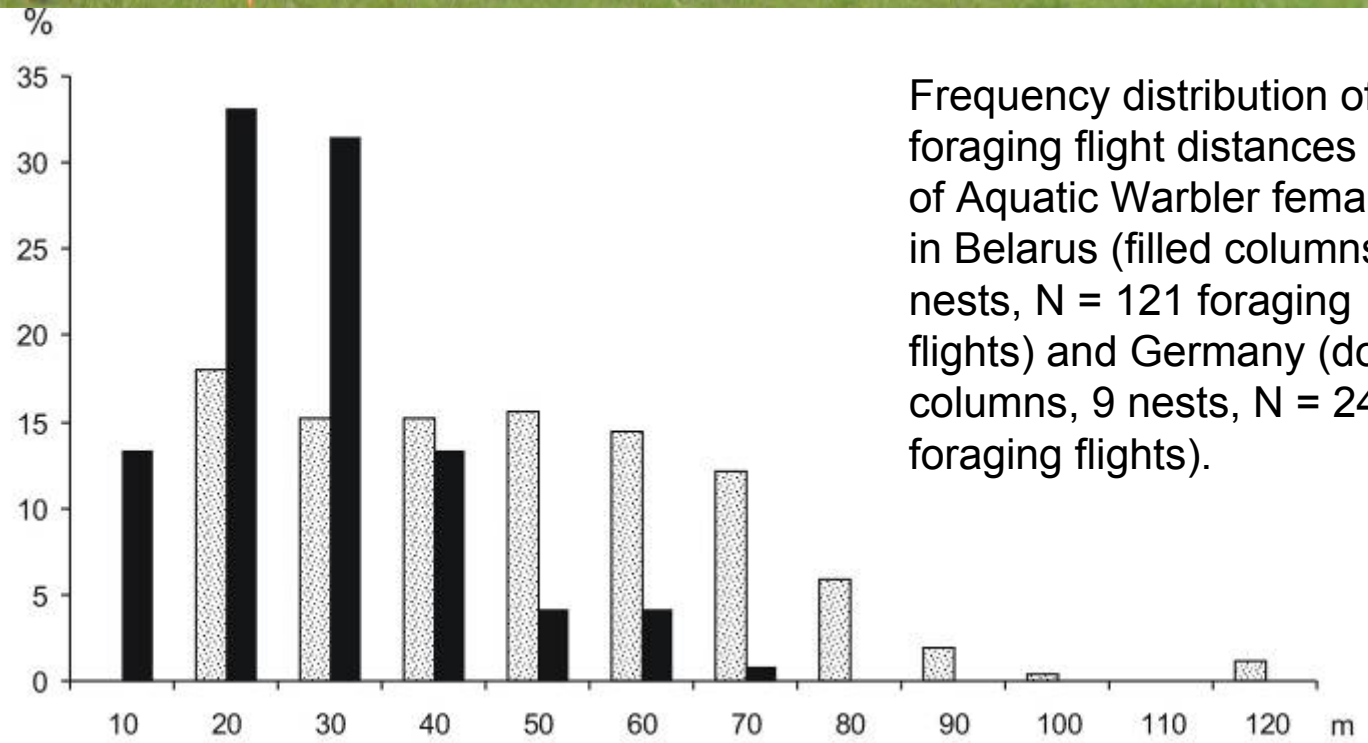
Data: all Pomeranian breeding sites (N=98 plots) 2006, boosted regression tree model

Food supply



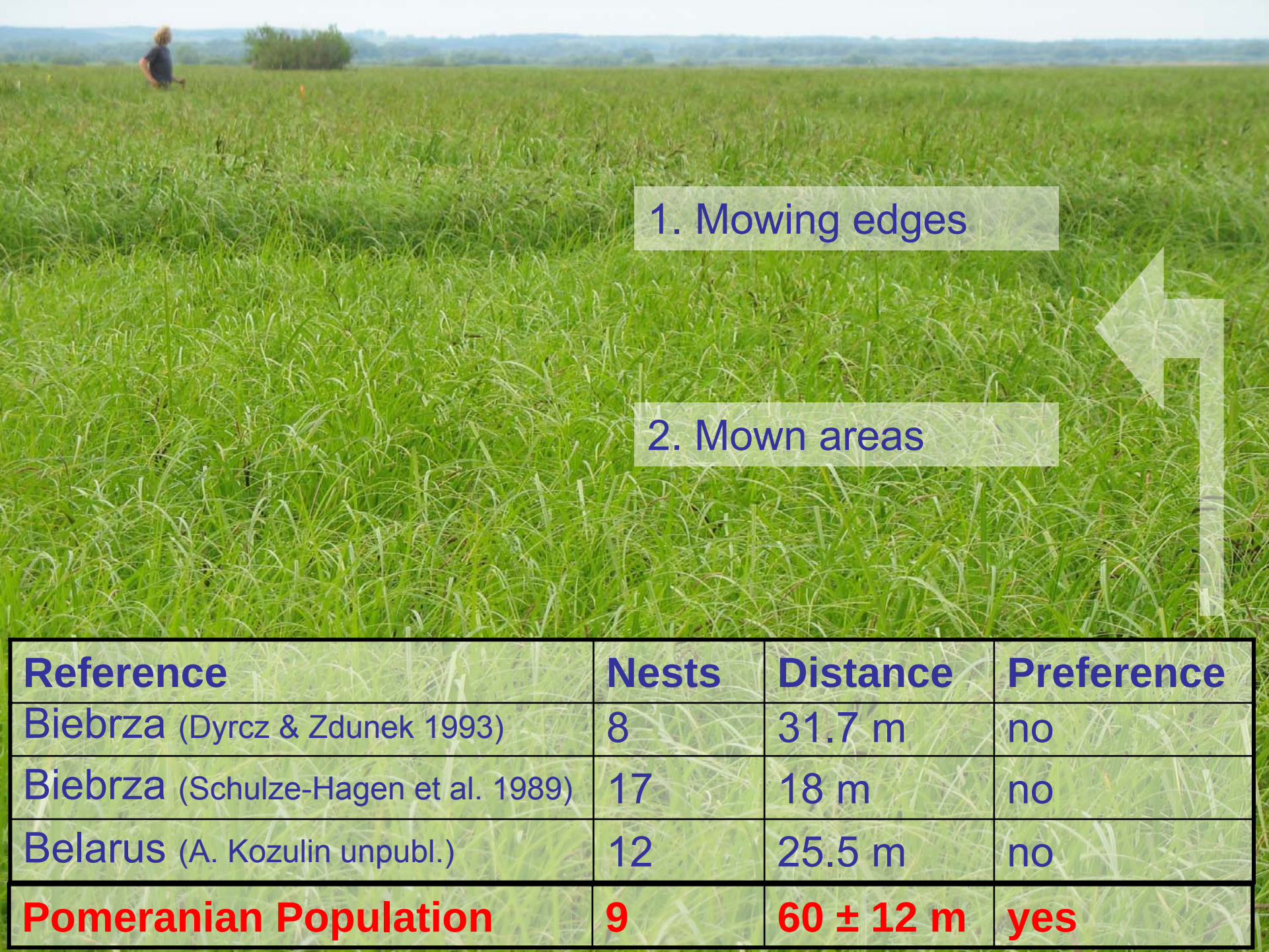
another important factor
in the habitat model

Data: all Pomeranian breeding sites (N=98 plots) 2006, boosted regression tree model



Frequency distribution of foraging flight distances (m) of Aquatic Warbler females in Belarus (filled columns, 12 nests, N = 121 foraging flights) and Germany (dotted columns, 9 nests, N = 246 foraging flights).

Reference	Nests	Distance	Preference
Biebrza (Dyrcz & Zdunek 1993)	8	31.7 m	no
Biebrza (Schulze-Hagen et al. 1989)	17	18 m	no
Belarus (A. Kozulin unpubl.)	12	25.5 m	no
Pomeranian Population	**9**	**60 ± 12 m**	**yes**



Reference	Nests	Distance	Preference
Biebrza (Dyrcz & Zdunek 1993)	8	31.7 m	no
Biebrza (Schulze-Hagen et al. 1989)	17	18 m	no
Belarus (A. Kozulin unpubl.)	12	25.5 m	no
Pomeranian Population	**9**	**60 ± 12 m**	**yes**

Food supply

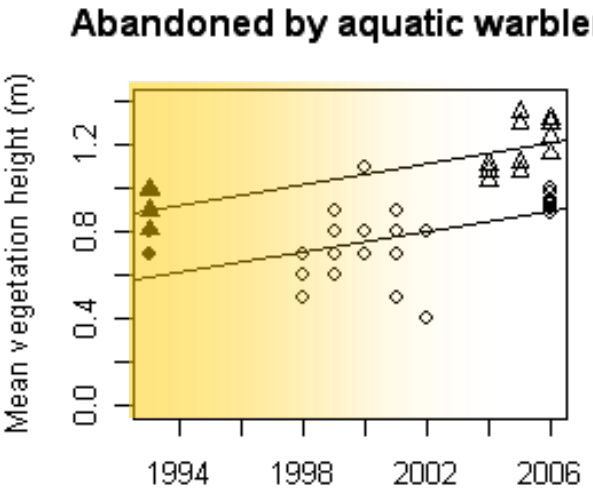
Site type	N	Median	Quartiles
Mown/grazed sedge vegetation	44	474.59 mg	358.74 - 556.23 mg
Unmown/ungrazed sedge vegetation	41	298.87 mg	160.33 - 377.11 mg
Mown/grazed reed vegetation	32	345.77 mg	172.98 - 567.91 mg
Unmown/ungrazed reed vegetation	4	54.72 mg	44.54 - 88.67 mg

→ differences between sedge and reed vegetation and influence of mowing/grazing!

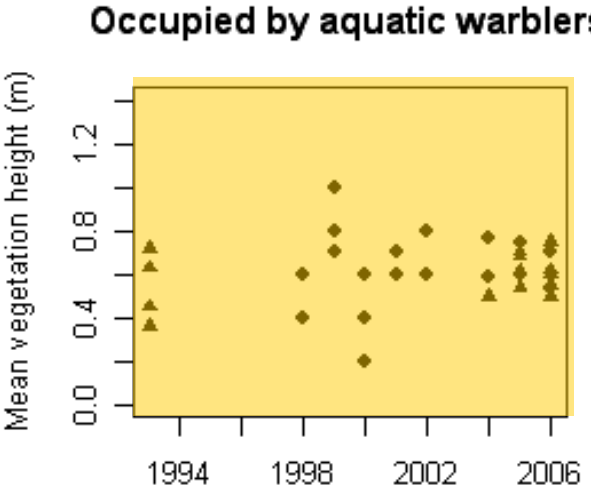
Data: all Pomeranian breeding sites (N=98 plots) 2006, GLMM

o plot centre: r = 0.858, n = 21, P <0.001; y = 0.872+0.024x
Δ plot margin: r = 0.518, n = 50, P <0.001; y = 0.567+0.023x

Influence of land use

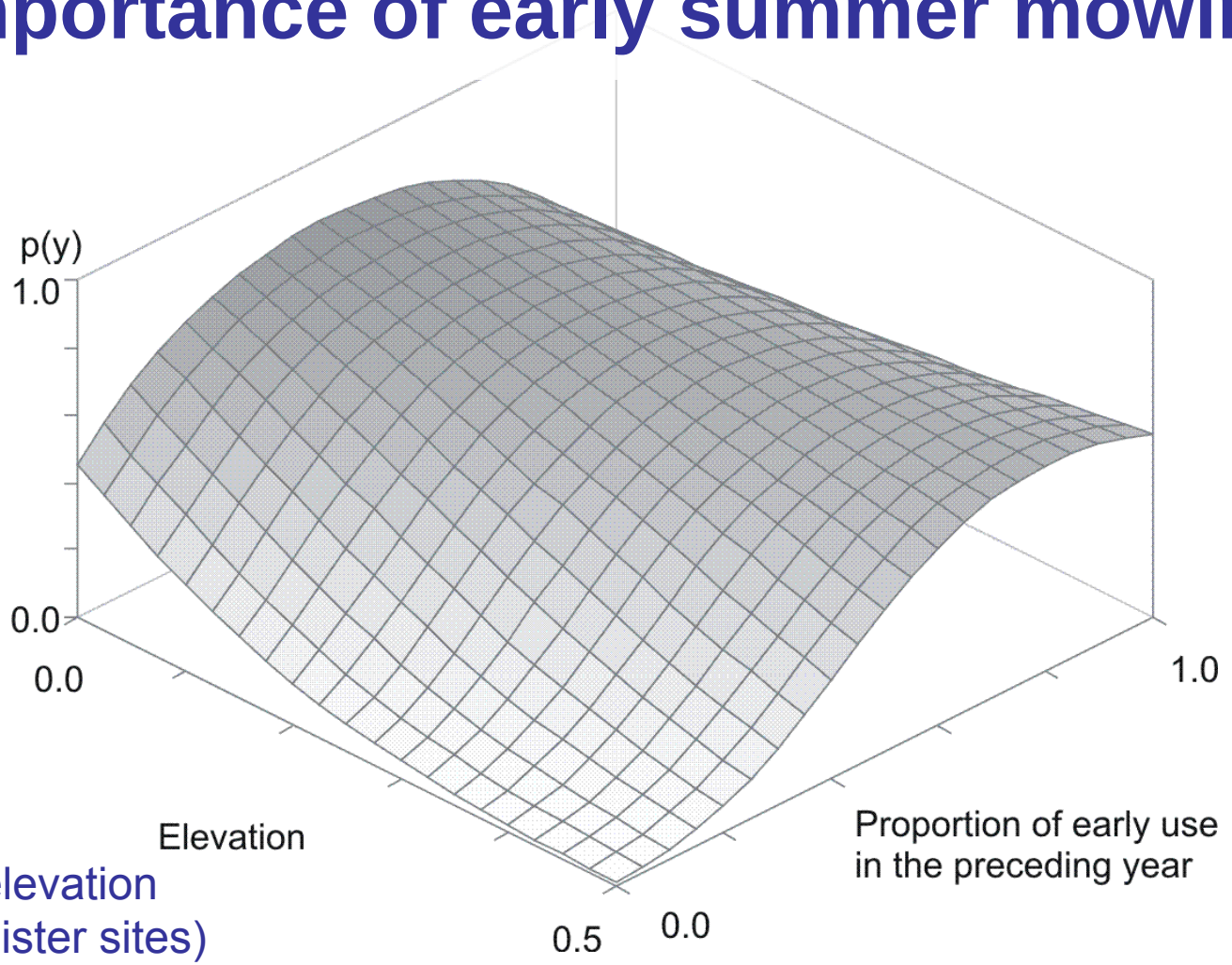


Intensity of mowing/grazing



Data: Lower Oder Valley National Park 1993-2006

Importance of early summer mowing



low elevation
(=moister sites)

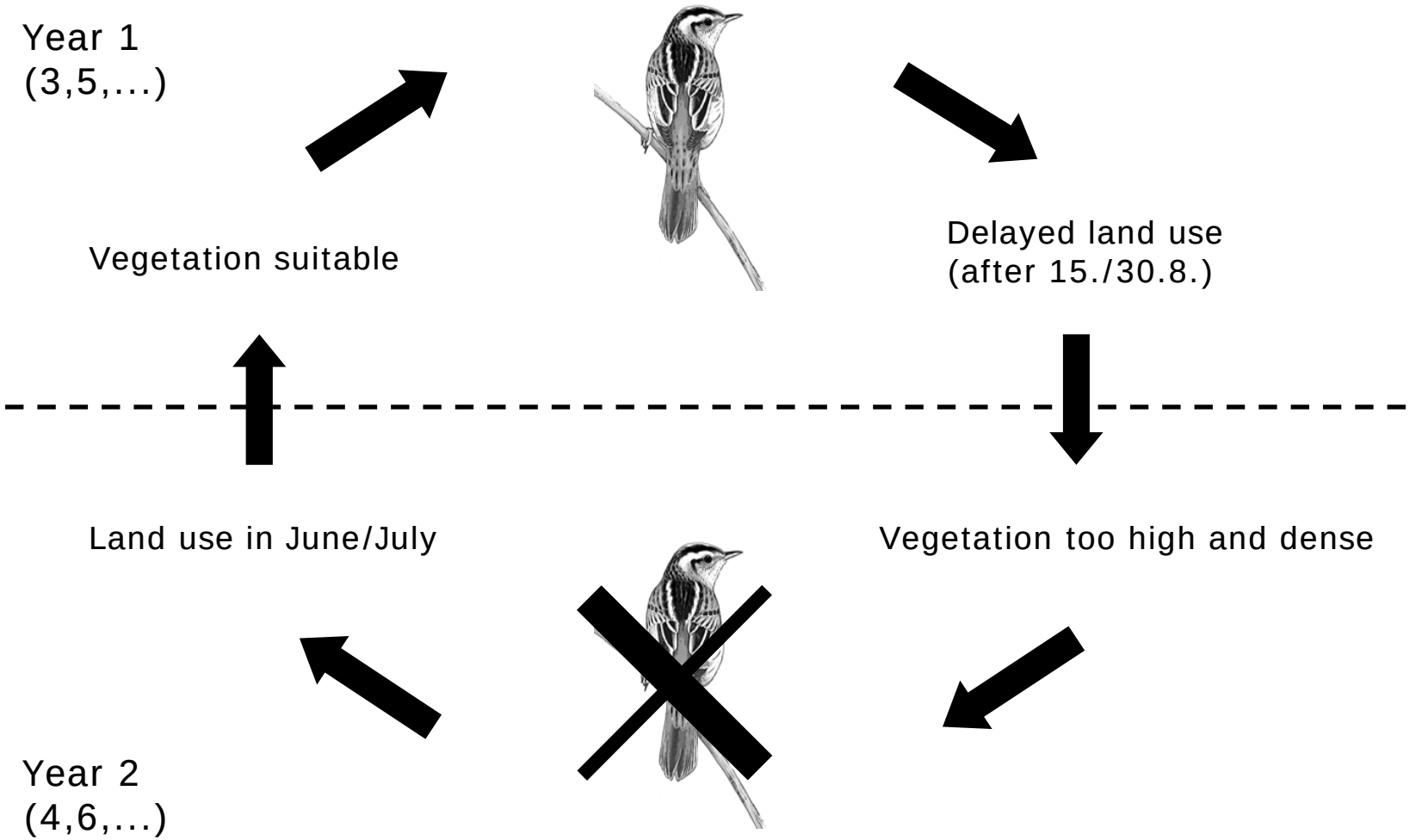
high elevation
(=drier sites)

→ here, a high proportion of early mown land is very important for the occurrence of AW

→ such land use threatens nests!!!

Data: Lower Oder Valley National Park 1998-2007; GLM mit AUC = 0.73, Nagelkerke's R2 = 0.228

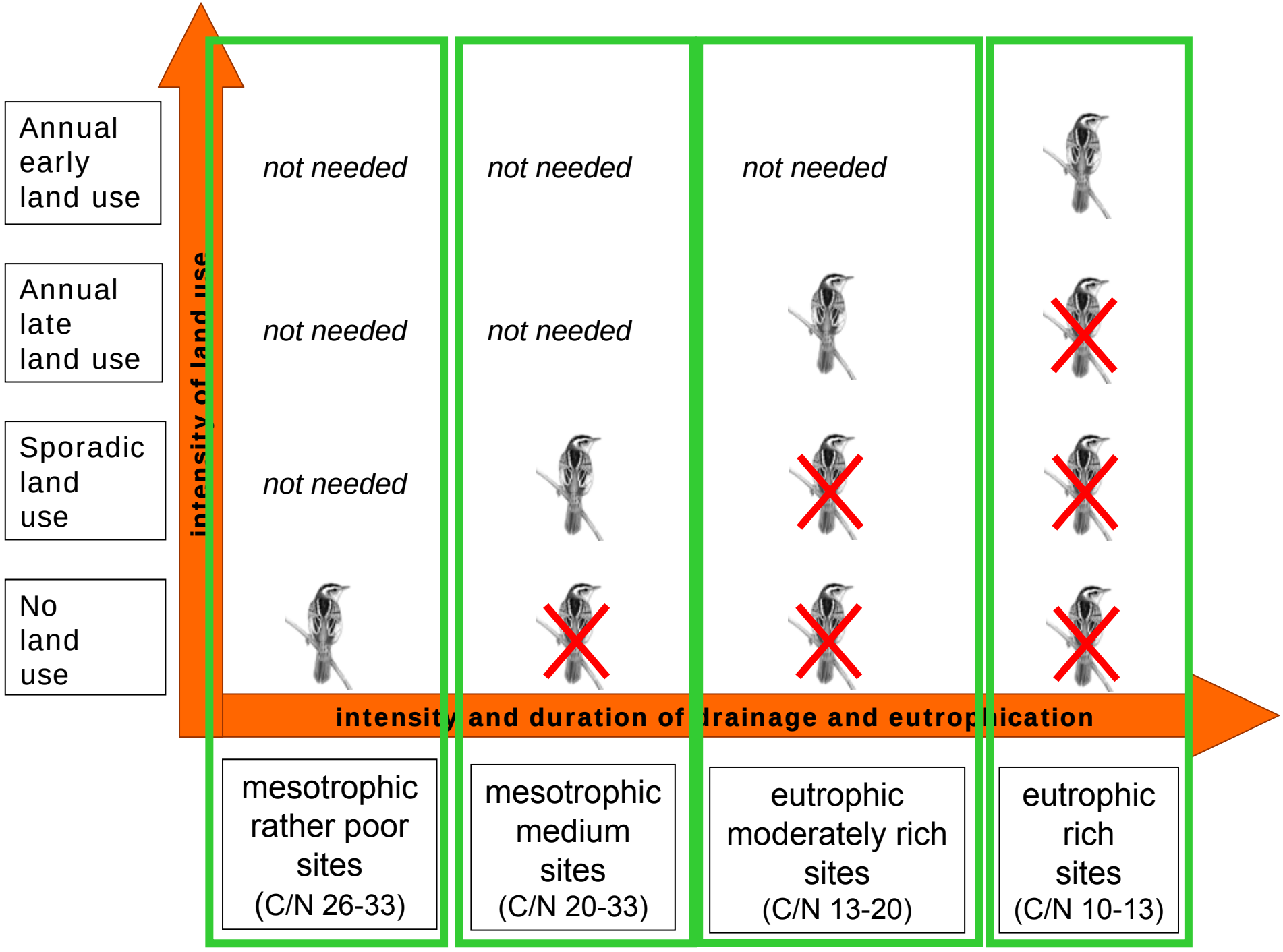
Alternating land use on more eutrophic sites



Summary and conclusions

- more vs. less productive sites (Oder Valley vs. coast)
- optimal conditions: low, sparse vegetation (as further east)
- contrast to core population: sites drier; low litter layer and heterogenous habitats preferred → probably connected to food supply (better) → therefore longer foraging flights to specific foraging habitats

more productive sites with AW	early summer land use with nest protection → mosaic, alternating land use
more productive sites without AW	early summer
less productive sites with AW	late (winter), monitoring of potential vegetation succession!
less productive sites without AW	late (winter); in case of reed overgrowth: early summer


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
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)

Many thanks for good co-operation and support to

GERMANY: J. Sadlik (Ornithologische AG Uckermark), J. Haferland & D. Treichel (NLP „Unteres Odertal“), A. Pataki & M. Bolz (Naturwacht NLP „Unteres Odertal“), T. Langgemach (Staatliche Vogelschutzwarte), A. Vössing (Nationalparkstiftung „Unteres Odertal“), A. Helmecke (Bölkendorf), P. Just (Universität Göttingen), T. Fartmann (Universität Münster), K. Schulze-Hagen (Mönchengladbach), B. Leisler (Vogelwarte Radolfzell), H. Flinks (Borken), A. Frick (Luftbild und Planung Potsdam), B. Schröder (Universität Potsdam), and all helpers during fieldwork,

POLAND: G. Kiljan (Swinoujscie), M. Dylawerski (Wolinski Park Narodowy), B. Migdalska (Park Krajobrazowy Dolina Dolnej Odry), P. Jabłoński, M. Maniakowski, P. Nawrocki & I. Flor (OTOP), S. Guentzel, M. Kalisinski & R. Czeraszkiewicz (Szczecin), M. Bartosziewicz & K. Wypychowski (Park Narodowy Ujscie Warty), J. Krogulec & J. Kloskowski (University Lublin), D. Wysocki (University Szczecin), T. Osiejuk (University Poznan)

BELARUS: M. Minets (Belarusian State University), M. Maksimenkov & A. Kozulin (Institute of Zoology, Belarusian Academy of Sciences)

LITHUANIA: Žydrunas Preikša (Nemuno Kilpu Regional Park), Kristina Mudinaite (Nemuno Delta Regional Park)

UNITED KINGDOM: Lars Lachmann & Norbert Schäffer (RSPB)

DBU, Studienstiftung des deutschen Volkes, Landesumweltamt Brandenburg & RSPB for financial support

...and all members of the AQUATIC WARBLER CONSERVATION TEAM (AWCT)!

Ernst Moritz Arndt
Universität Greifswald

Studienstiftung
des deutschen Volkes

DBU