

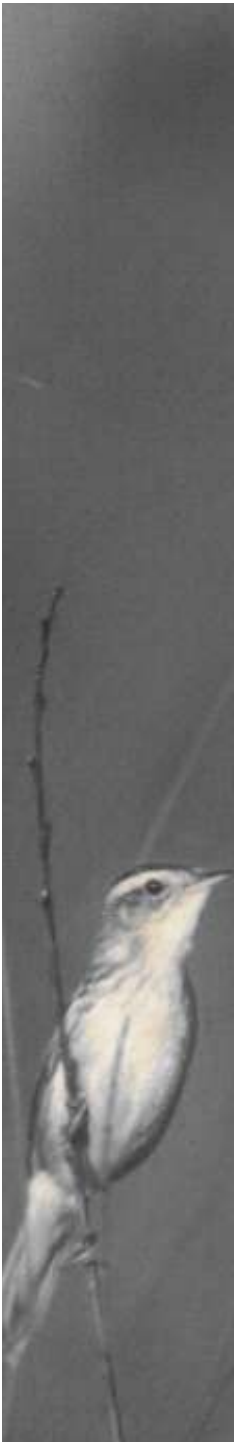
Optimal mowing dates under varying circumstances

POMERANIA

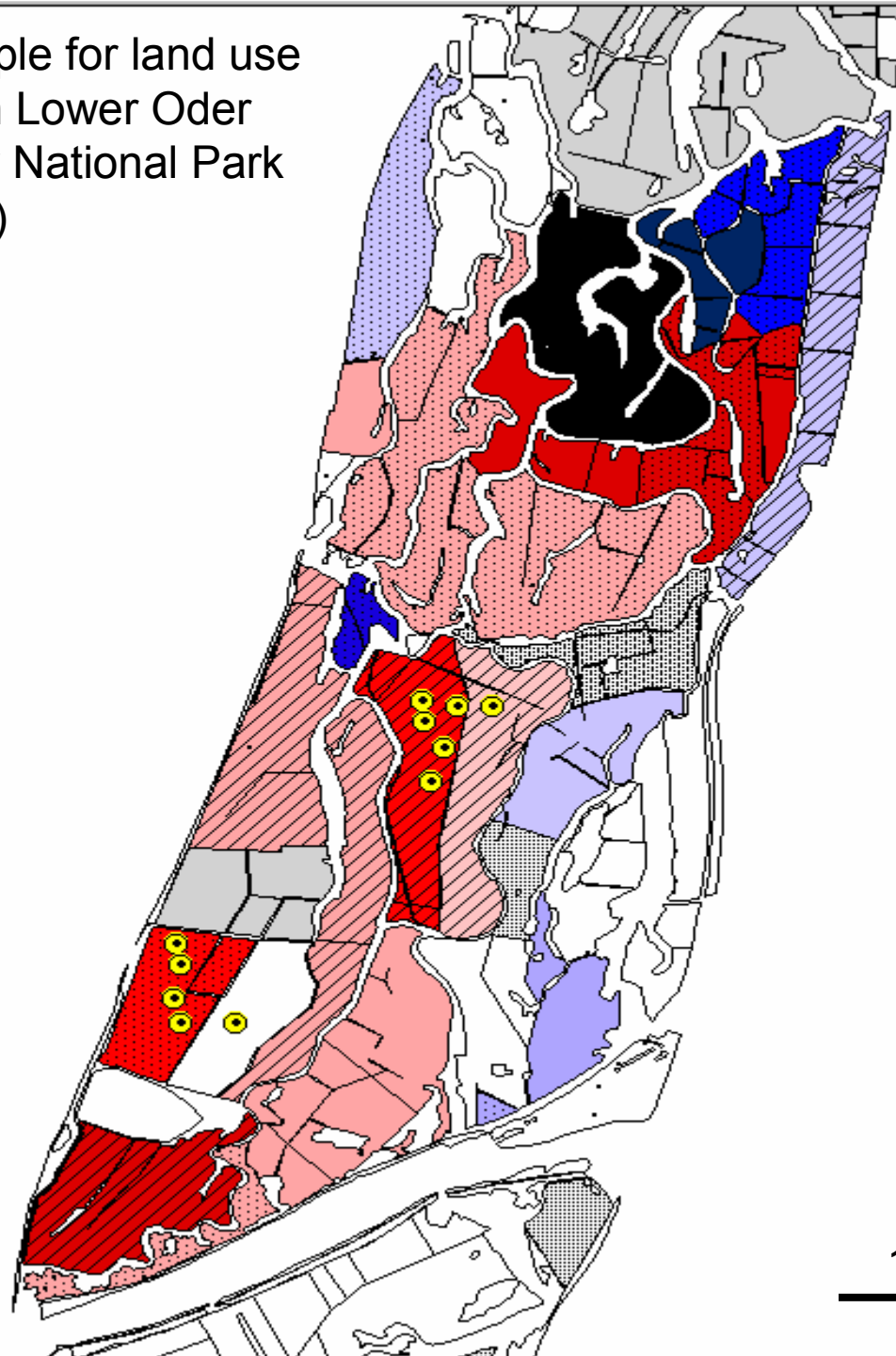
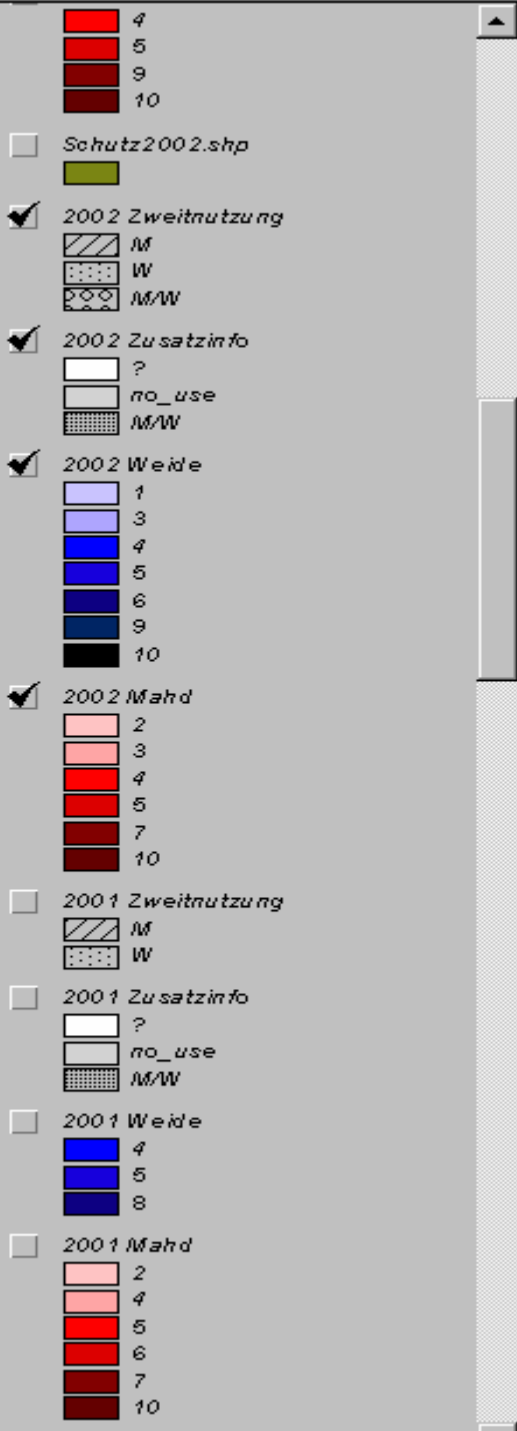
Franziska Tanneberger

Results from a study in Lower Oder Valley National Park, Germany

- vegetation data available from permanent plots (marked with magnets) for the years 1993-2007 (studies on corncrake, *Cnidium dubium*,...)
- land use data available from National Park and interviews with farmers



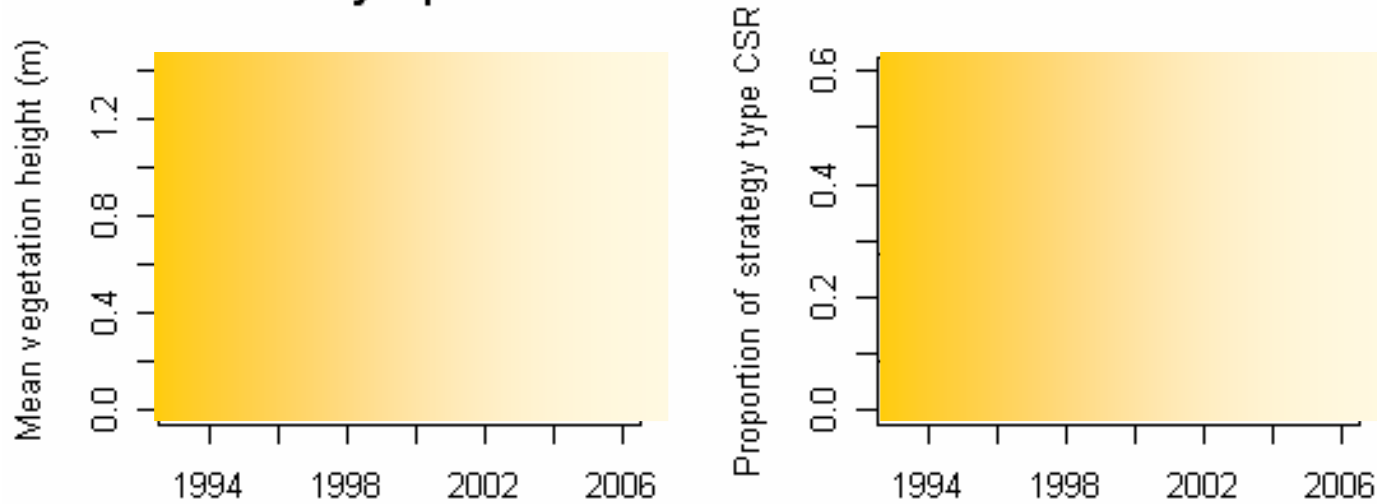
Example for land use GIS in Lower Oder Valley National Park (2002)



1 km

Tanneberger, F., Bellebaum, J., Helmecke, A., Fartmann, T., Just, P., Jehle, P. & J. Sadlik (accepted): Rapid deterioration of aquatic warbler *Acrocephalus paludicola* habitats at the western margin of its breeding range. Journal of Ornithology. DOI 10.1007/s10336-007-0241-2

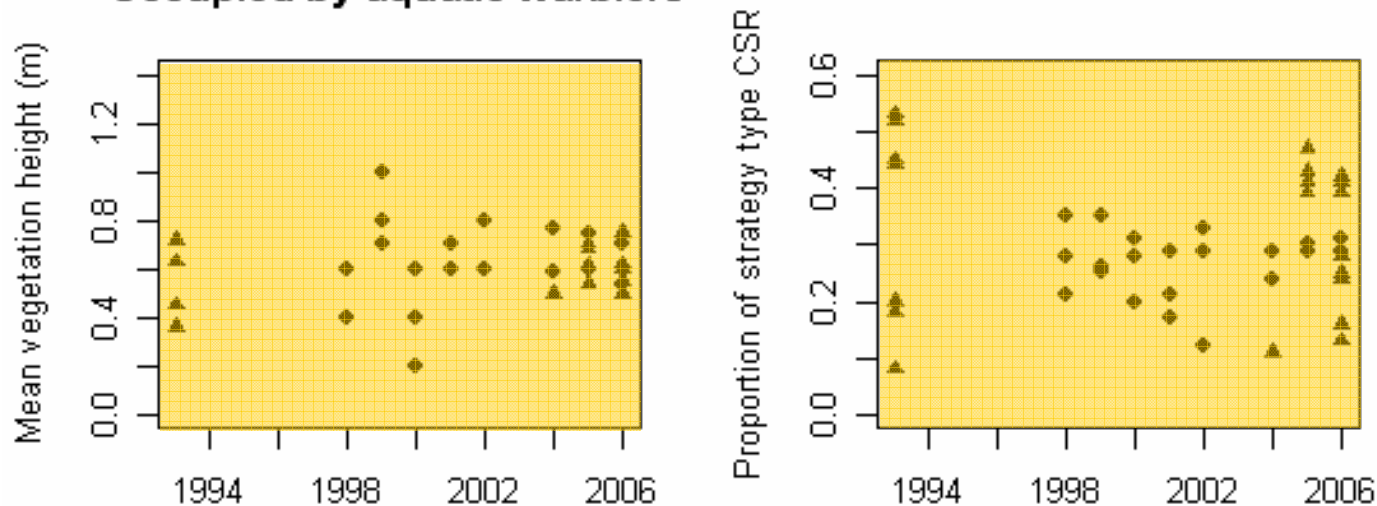
Abandoned by aquatic warblers



o plot centre: $r = 0.858$, $n = 21$, $P < 0.001$; equation of the line: $y = 0.872 + 0.024x$

Δ plot margin: $r = 0.518$, $n = 50$, $P < 0.001$; equation of the line: $y = 0.567 + 0.023x$

Occupied by aquatic warblers

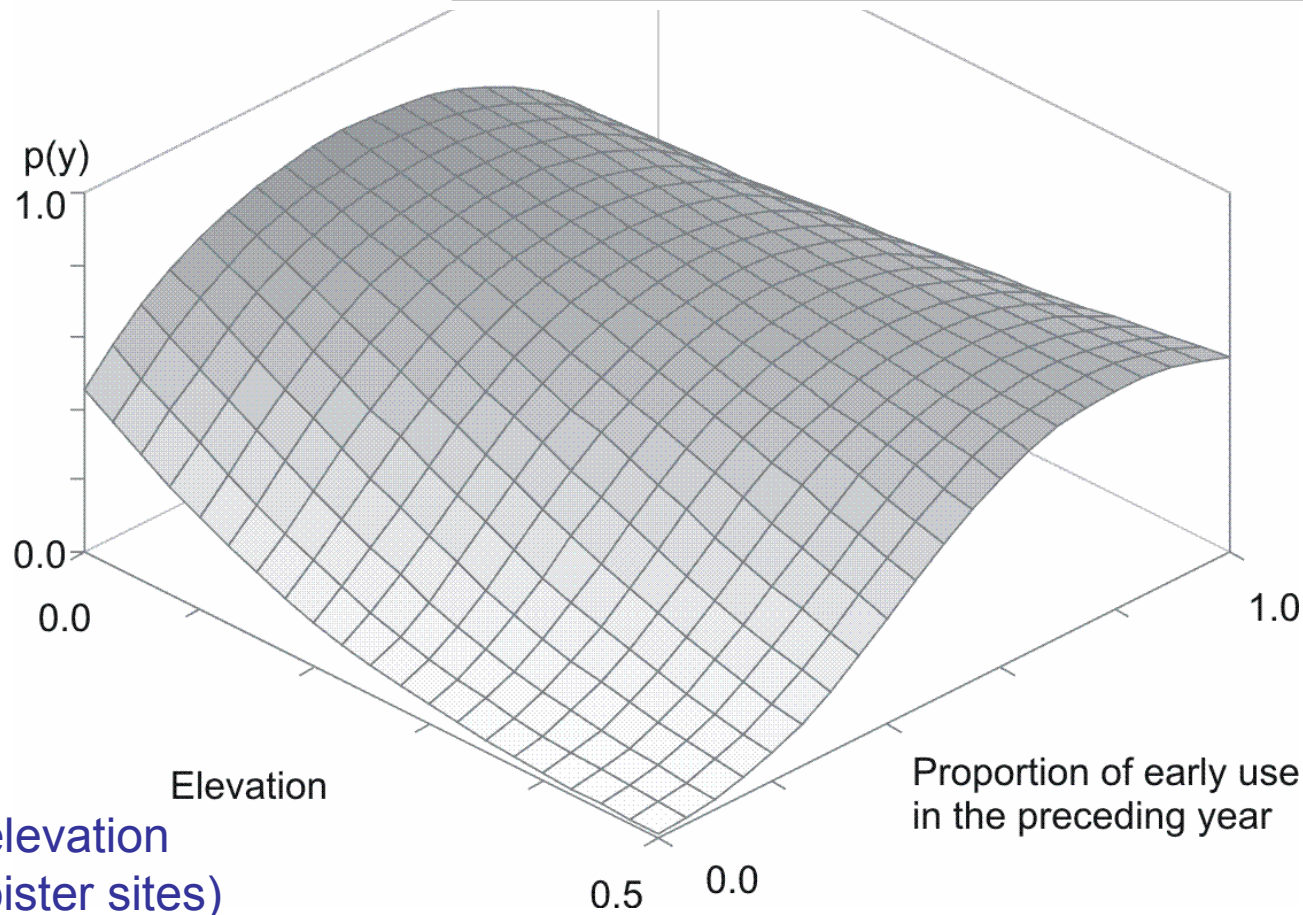


o plot centre: $r = 0.872$, $n = 21$, $P < 0.001$; equation of the line: $y = 0.092 - 0.007x$

Δ plot margin: $r = 0.523$, $n = 50$, $P < 0.001$; equation of the line: $y = 0.285 + 0.015x$

Tanneberger, F., Bellebaum, J., Helmecke, A., Fartmann, T., Just, P., Jehle, P. & J. Sadlik (accepted): Rapid deterioration of aquatic warbler *Acrocephalus paludicola* habitats at the western margin of its breeding range. Journal of Ornithology. DOI 10.1007/s10336-007-0241-2

Parameter	Coefficient	SE	Wald statistic	P
Intercept	-0.1913	0.6904	-0.28	0.7817
Elevation	-8.9123	3.7472	-2.38	0.0174
Proportion of early use	7.1423	2.7225	2.62	0.0087
Proportion of early use ²	-7.6919	2.6329	-2.92	0.0035
Elevation*proportion of early use	10.7371	4.7937	2.24	0.0251



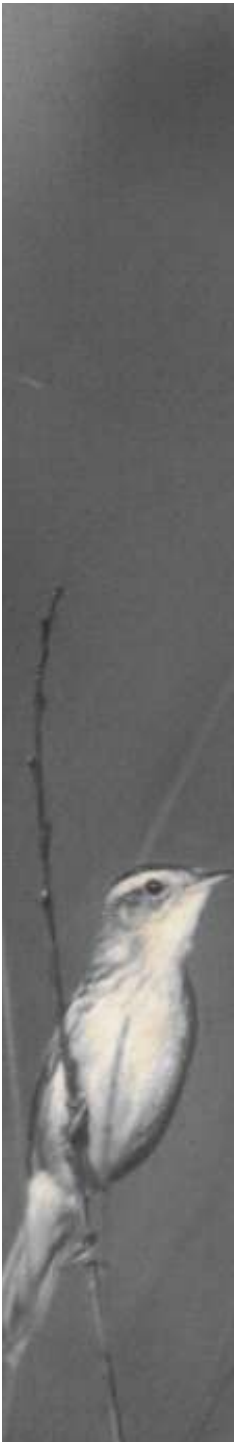
low elevation
(=moister sites)


high elevation
(=drier sites)

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

Conclusions in LOV NP

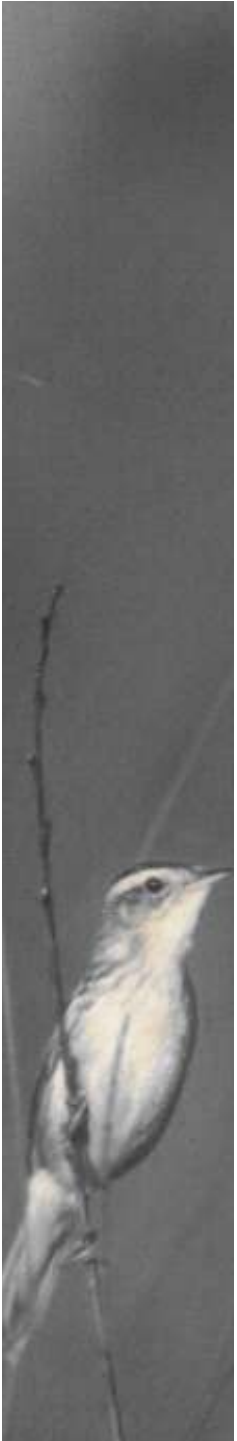
- early mowing is important for maintaining a suitable vegetation structure (some sites deteriorate within one year!)
- nest protection:
 - no mowing of potential AW sites (=sites regularly mown in previous years) before end of June
 - in June: intensive search for females
 - when nest areas have been identified: mow parts without AW nests in July and parts with AW later





???

Risks – decision taken too early or tractor drivers „don't see“ the markings...
But are there other solutions???



**Optimal timing of summer mowing
in eutrophic river valley sites is a
big challenge!!!!!!!!!!!!!!**

	Density (sm/10 ha)	Vegetation structure				Site conditions		
		similar		different		different		
		Vegetation height (m)	Cover of CSR species (%)	Thickness of litter layer (cm)	Cover of mosses (%)	Water level (cm)	Water level amplitude April- August (cm)	Nutrient availability ^a (soil C/N ratio)
Floodplain polders								
Germany, Lower Oder Valley polders ^b	0.9–1.7	0.4–0.8	5–34	low (0–8)	0	0	high (>50)	eutrophic (10–14)
Lithuania, Nemunas delta polders ^c	0.7–1.7	0.4–0.6	10–54	low (0–10)	0	0	high (>50)	eutrophic (11–18)
Percolation mires								
Poland, Biebrza Valley ^d	1–11	0.6–0.8	5–21	high (29–39)	40–100	0–25	low	mesotrophic (mean ±SD: 21.45 ±2.2)
Belarus, fen mires ^e	1–13.5	0.6–0.7	3–20	medium to high (10–35)	60–100	0–10	low (0–20)	mesotrophic (mean: 20.2)
Ukraine, fen mires ^f	3.3–11.5	0.6–0.7	9–11	medium	60–100	0–20	low (<20)	mesotrophic

^a nutrient availability classes after Succow & Joosten (2001)

^b this study (density data for long-term study plot before population decline; vegetation height data from May, all other vegetation data from June)

^c F. Tanneberger & Z. Preiksa unpubl., density: Sysa polder for 2004 and 2006; all other: for 2006

^d Sellin (1989), Dyrz & Zdunek (1993) and P. Marczakiewicz unpubl. for 2006; soil C/N ratio: Wassen & Joosten (1996) for Biebrza Upper Basin

^e Kozulin & Flade (1999), Vergeichik & Kozulin (2006); CSR and litter: J. Stepanovich pers. comm.; soil C/N ratio: N. Bambalov pers. comm.

^f A. Poluda unpubl. for key habitats 2003 and F. Tanneberger unpubl. for 2005

Table 1: Site characteristics of the Pomeranian Aquatic Warbler breeding sites. Soil data are from literature; water level data are given separately, if more than one vegetation type occurs within one site (see table 2 for abbreviations); land use types: WM = winter mowing; SM = summer mowing; GR = grazing; Aquatic Warbler data are from OTOP unpublished and own observations. Sites 4 and 8 are not included in the vegetation study, as

⊕ Aquatic Warblers were recorded here only in 2007. NA = no data.

No.	Code	Breeding site	Location	Main soil type	Mean water levels in May/June/July 2005 (cm) *	Trophic class (based on soil C/N ratio in 2005)	Acidity class (based on soil pH in 2005)	Main land use type	Aquatic Warblers (sm) 2004-2007
COASTAL AND SMALL RIVER VALLEY SITES									
1	RO	Rozwarowo Marshes	small river valley (partly dikes)	peat	VF13: 0/4/2 VF27: 17/15/7	eutrophic – mod. rich 18.8 (15.8-25.1)	subneutral 5.3 (3.8-6.0)	WM	22–37
2	WP	Wolin National Park	islands in Świna delta (no dikes)	peat	NA/0/NA	eutrophic – mod. rich 17.5 (16.3-19)	subneutral 5.4 (5.3-5.5)	WM, SM, GR	8–18
3	KK	Karsiborska Kępa	island in Świna delta (with dike)	peat	4/8/3	eutrophic – mod. rich 15.6 (13.4-18.4)	subneutral 5.3 (4.2-6.0)	WM, SM, GR	11–21
4	ZL	Zajęcze Łęgi	island in Świna delta (with dike)	peat	NA/5/NA	eutrophic – mod. rich 16.6 (15.6-17.5)	subneutral 4.4 (4-4.7)	WM, SM, GR	0–2
5	MI	Miedwie Lake	small river valley (no dike)	peat	32/26/6	eutrophic – mod. rich 15.3 (12.0-21.0)	alkaline 7.0 (6.7-7.1)	SM, GR	0–8
LOWER ODER VALLEY SITES									
6	GR	Gryfino	outer Odra polder (with dike)	peat	3/5/0	eutrophic – rich 12.7 (10.4-18.4)	subneutral 5.9 (4.7-6.9)	SM	5–7
7	CR	Lower Oder Valley National Park	inner Oder polder (with dike)	mineral soil	VF 30m: 0.5/0/0 VF 30u: 8/2/0	eutrophic – rich 11.5 (9.8-13.8)	subneutral 5.4 (4.6-7.2)	SM, GR	4–9
8	SR	Stara Rudnica	Odra floodplain (no dike)	mineral soil	30/15/NA	eutrophic – rich (10.4)	subneutral 5.5	no land use	0–1
9	SL	Warta Mouth National Park	Warta floodplain (no dike)	peat	0/0/0	eutrophic – rich 10.8 (10.3-12.5)	subneutral 6.0 (5.6-6.7)	SM, GR	2–10

* above soil surface

Sources:

- Rozwarowo Marshes: Dreyer (1914), Tegetmeyer (2006), Jurzyk (2004a)
- Wolin National Park: Jasnowski (1962), Jurzyk (2004a), Karsiborska Kępa: Jasnowski (1962), Matkowska et al. (1977)
- Zajęcze Łęgi: Jasnowski (1962), Matkowska et al. (1977)
- Miedwie Lake: Jasnowski (1962), Borówka (2007)
- Gryfino: Dreyer (1914), Niedzwiecki (2002), Jasnowski (1962)
- Lower Oder Valley National Park: code refers to Cniewen village; Dreyer (1914), IUS (1999)
- Stara Rudnica: belongs to the area Kostrzyneckie Rozlewisko; Krogulec (1998)
- Warta Mouth National Park: code refers to Słońsk town; Engel et al. 1998, Osiejuk et al. (1999)

optimal mowing timing depends on nutrient conditions...

Conclusions

rich sites with AW	early (with nest protection)
rich sites without AW	early
moderately rich sites with AW	late; in case of reed overgrowth: early (with nest protection)
moderately rich sites without AW	late; in case of reed overgrowth: early

2nd mowing - mostly done on early mown sites – needed?

