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The Aquatic Warbler - Saving Europe's most threatened song bird

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The Aquatic Warbler (*Acrocephalus paludicola*) is a small bird breeding in fen mires with a water depth of 1 - 10 cm and in other similarly structured wetlands. Once widespread, the species is nowadays globally threatened and on the verge of extinction in its westernmost habitats. Cooperation between reed cutters and conservationists raises hope for survival.

The Aquatic Warbler (Fig. 1) was widespread in Central-European wetlands at the beginning of the 20th century, particularly in sedge fens and river floodplains (Schulze-Hagen 1991). In 1910, the ornithologist Hesse stated about Northeast Germany: "*What in particular characterizes the Aquatic Warbler is its commonness... it occurs all over the vast fen mires...*" (translated by the authors). In the course of the 20th century, the world population decreased severely as a consequence of wetland drainage and agricultural intensification. The species became extinct in France, Belgium, Italy, and the Netherlands; in Northeast Germany the population shrank to 0.2% of its former size.

World distribution and characteristics

Currently, the Aquatic Warbler breeds in seven countries on less than 50 sites (Fig. 2). Its world population comprises 13,330 - 18,925 singing males (the "counting unit", as females lead a hidden life), of which approx. 90%



Fig. 1: The Aquatic Warbler – a species characteristic for fen mires.

are concentrated in the Polesie region in Southern Belarus/Eastern Poland/Northern Ukraine (Aquatic Warbler Conservation Team 2006).

The latter core population has been relatively stable in recent years thanks to conservation activities of national governments and NGOs. Much smaller in number are the Pomeranian (Eastern Germany and Western Poland) and Western Siberian populations. In the latter area, even no permanent Aquatic Warbler breeding sites are established.

The species is classified as vulnerable at a global level (BirdLife International 2004). A Memorandum of Understanding under the Convention on Migratory Species concerning conservation measures for the Aquatic Warbler - the first and only Memorandum for an inconspicuous "little

brown bird" - was signed in Minsk in April 2003.

The Aquatic Warbler has an extraordinary breeding system with uniparental care and a mating system varying between promiscuity and polygyny: one clutch may have up to 5 fathers but only the female is involved in bringing up the young (Schulze-Hagen et al. 1999). Nests are built on or near to the ground. The diet consists mostly of large arthropods (Aquatic Warbler Conservation Team 1999).

In primeval landscapes, the species probably bred in mesotrophic and slightly eutrophic river valley mires (Aquatic Warbler Conservation Team 1999) that remained useless because their surface oscillated with the water table. Their sparse sedge growth offered optimal conditions to the species which predominantly forages

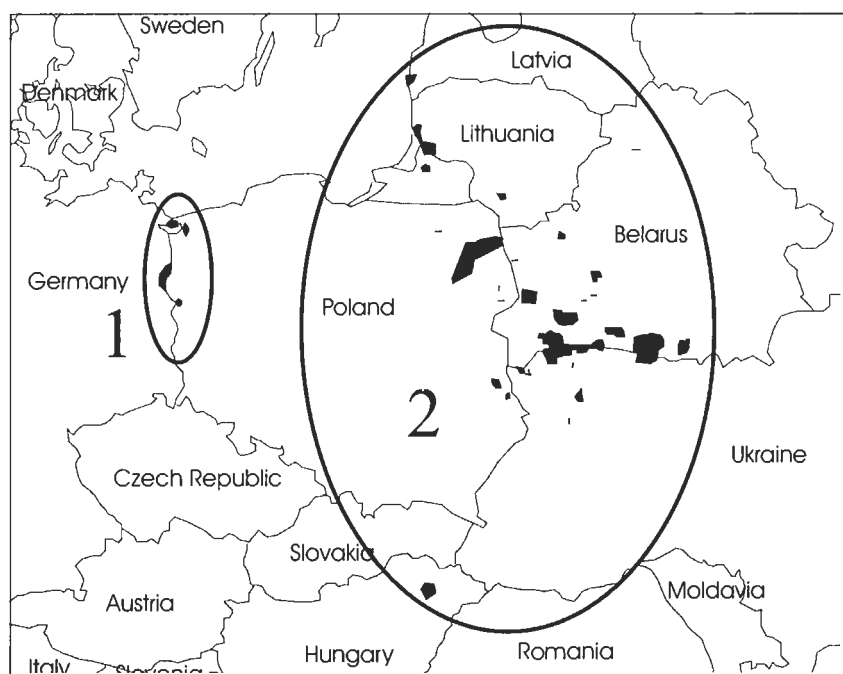


Fig. 2: Global distribution of the Aquatic Warbler. 1 = Pomeranian population; 2 = current core population. The Western Siberian population (no permanent breeding) is not depicted. Current breeding sites are indicated in dark grey (information from Aquatic Warbler Conservation Team).

by climbing in the vegetation (Leisler 1981). The habitats of the current core population are the still largely intact floodplain fens of the rivers Pripyat, Dnyepir and Biebrza with *Carex elata* and *Carex appropinquata* sedge communities. Regular biomass removal by low-intensity agriculture or accidental burning also kept the vegetation sparse during the last centuries with its increasing nitrogen deposition.

The Pomeranian population

The Aquatic Warbler population in Pomerania has a key function for the conservation of the species. It is genetically distinct from all other studied Aquatic Warbler populations (Giessing 2002). Furthermore, isotope analyses of feathers revealed that the Pomeranian Aquatic Warblers have most probably a more northerly wintering area than the other populations (Pain et al. 2003).

Apparent differences in song behaviour are currently being studied in a joint project of Greifswald and Poznan University. These recent findings and the historical record suggest that the remaining birds in Pomerania are the last survivors of a distinct, large Western population (Aquatic Warbler Conservation Team 1999).

The Pomeranian population has decreased sharply in numbers in recent years: The number of singing males fell from 383 in 1991 (Aquatic Warbler Conservation Team 1999), via 230 in 1997 (Krogulec & Kłoskowski 2003), to currently 80. Therefore, the Memorandum of Understanding gives special attention to research, improved management, and restoration of Aquatic Warbler habitats in Pomerania.

A major obstacle is the insufficient knowledge on Aquatic Warbler habitats, which differ in Pomerania from those of the well-studied core population (Dyrce & Zdunek 1993, Kozulin & Flade 1999, Vergechik & Kozulin 2006): The sites around Szczecin Bay (1-4 in Fig. 3) predominantly consist of Common Reed (*Phragmites australis*), whereas

those in the Lower Odra Valley (5 - 9) have a mixed vegetation of sedges and grasses with *Carex gracilis* and *Phalaris arundinacea* dominating. All breeding sites in Pomerania are being mown or grazed (Tanneberger et al. 2005).

A research project in progress at Greifswald University addresses Aquatic Warbler habitat restoration in Pomerania by comparing currently occupied and recently abandoned sites. Preliminary results indicate that food supply might be a limiting factor (Tanneberger et al. in prep.). Particular attention is paid to the Rozwarowo Marshes, which - with currently 47% of the Pomeranian population, is the major stronghold of the species in the region.

Rozwarowo Marshes

The Rozwarowo Marshes (1,600 ha) are located 15 km from the Baltic Sea between Kamień Pomorski and Wolin in Northwest Poland. The peatland is approx. 7 km long and 3 km wide and is surrounded by agricultural land and some forest in the south. It is divided into an eastern and a western part by the Grzybnica river.

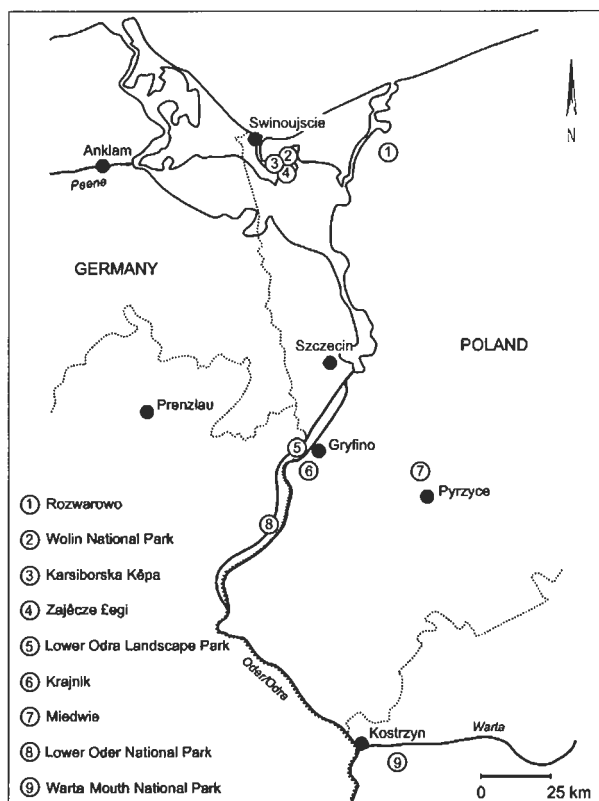


Fig. 3: The last remaining Aquatic Warbler breeding sites in the Polish-German border region (Pomeranian population).

The peatland fills up a glacial basin in the hummocky till plains of Pomerania that was shaped by melting inland ice. The peatland originated by terrestrialization and paludification with predominantly reed (*Phragmites australis*) peat (Fig. 4). In the western basin, with a maximum depth of 8 m, reed and brownmoss peats compose the basal layer. A subsequent, up to 3.5 m thick layer of lake sediments (gyttja) indicates a long period of open water probably associated with the Litorina Transgression (7-3 ka BP). Layers of reed, sedge and brownmoss peat that accumulated after the terrestrialization of the water body due to the continuing rising of the Baltic Sea water level (cf. Janke 1996) cover the lake sediments and also fill the shallow eastern basin. Alder (*Alnus glutinosa*) and reed-alder peat occur in the marginal areas of the mire.

From historical maps, it is known that the Rozwarowo Marshes constituted part of the borderline between Prussia and Sweden in 1679. Several ditches and a settlement on maps from the 19th and 20th century indicate that the area was used for grazing, mowing and peat extraction. The settlement was abandoned after World War II and agricultural use of the peatland stopped. The Rozwarowo Marshes have never been intensively drained, despite of plans to do so (Dreyer 1913). After more than 40 years without land use, winter reed-cutting for thatching started in 1989. In 2004, along with the enlargement of the European Union (EU), the peatland was designated as a NATURA 2000 site.

Aquatic Warbler habitats in the Rozwarowo Marshes

The prevailing plant species in the Rozwarowo Marshes is Common Reed (*Phragmites australis*). Some areas are dominated by sedges and other marsh

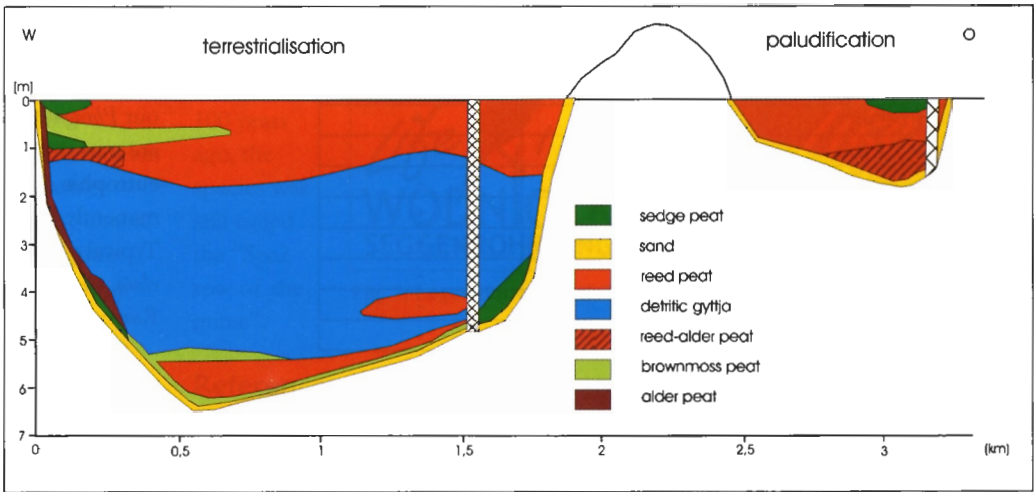


Fig. 4: Stratigraphy of the Rozwarowo Marshes.

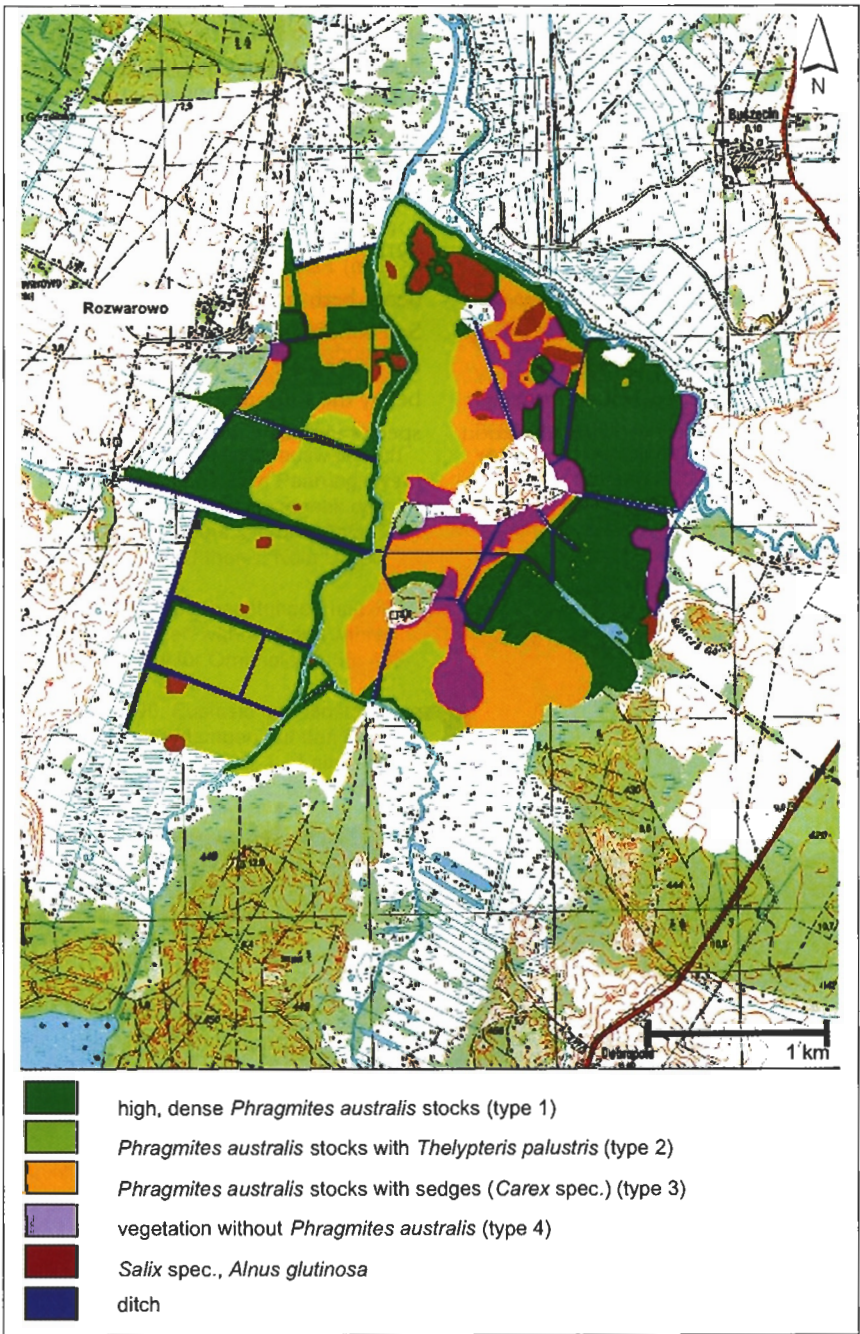


Fig. 5: Vegetation map of the Rozwarowo Marshes.

Table 1: "Interests" of reed cutters and Aquatic Warbler.

	Farmer	Aquatic Warbler
winter reed cutting	+	+
loose reed 1-2 m	+	+
dense reed 1-2 m	+	-
reed > 2 m	-	-
herbs between reed	- / +	+
mesotrophic soil conditions	+	+
shrubs and trees	-	-
water level > 10 cm	+	-
eutrophic irrigation water	-	-

plants or by isolated groups of alder and willow shrubs.

On the basis of the vegetation structure (which is very important in Aquatic Warbler habitat selection, Kozulin & Flade 1999) and species composition, four main vegetation types were distinguished (Fig. 5, Tegetmeyer 2006). Type 1 represents up to 2.5 m high, dense stocks of Common Reed with mostly eutrophic soil conditions and the water level generally above the soil surface. Typical additional plant species include *Lycopus europaeus*, *Spirodela polyrrhiza*, *Urtica dioica*, *Calystegia sepium* and *Solanum dulcamara*.

Type 2 consists of moderately high (< 2 m) and loosely growing Common

Reed under which the broad leaves of Marsh Fern (*Thelypteris palustris*) create an additional plant layer. Soil conditions are mesotrophic and in large areas the water level is permanently at or below the soil surface. Typical additional plant species include *Peucedanum palustre*, *Lysimachia vulgaris* and *Ilythrum salicaria*. This type mainly occurs in the western and northeastern parts of the area.

Type 3 comprises moderately high (< 2 m) *Phragmites australis* stocks with a dense herb layer dominated by sedges. Soil conditions are mesotrophic and the water level is permanently at or below the soil surface. Typical plant species include *Carex gracilis*, *Carex*

elata, *Potentilla palustris*, and the moss *Leptodictium riparium*.

Type 4 is dominated by sedges without *Phragmites australis*. Soil conditions are mesotrophic, sometimes slightly eutrophic and the water level lies permanently high above the soil surface. Typical plant species include *Carex elata*, *Carex disticha*, *Equisetum fluviatile*, *Rumex hydrolapatum* and *Typha latifolia*.

Comparing the 2005 vegetation map with the recent occurrences of Aquatic Warbler, we found that the bird favours areas of vegetation type 2. A few times it was found in vegetation type 3 but only in areas close to type 2.

Aquatic Warblers and reed cutters

Aquatic Warblers and reed cutters have largely parallel interests (Table 1). The cutting of thatch in winter (Fig. 6) prevents the expansion of shrubs and removes dead reed material. The reed farmers furthermore enlarge the open reed area by clearing small woods.

The ideal reed for thatching is straight, fine, stable and rather short, but not less than 80 cm long (A. Smolczynski, pers. comm.). Thatches made of such reed are durable and especially water-proof. Reed of this quality grows under mesotrophic to slightly eutrophic soil conditions. These are primarily sites of vegetation type 2 where the Aquatic Warbler habitats are also concentrated.

The interests of farmers and the Aquatic Warbler only seem to differ with respect to the water level. The farmers try to stimulate the growth and expansion of Common Reed by raising the water level, especially on sites



Fig. 6: Reed cutting in Rozwarowo Marshes, January 2006.

of vegetation type 4. For that purpose, they collect water of the Grzybnica and Wolczenica rivers and distribute it by means of ditches and dikes.

Water levels higher than 10 cm seem to be harmful for Aquatic Warbler because they decrease the area suitable for nesting. In an EU LIFE Nature project, we currently investigate how precisely the water level influences Aquatic Warbler habitats in order to find an optimum between economic and ecological needs. One insight is already emerging: the eutrophic river water used to raise the water level may eventually fertilize the area to such an extent that it becomes less suitable for growing high quality reed. So where short-term water level demands of reed production and Aquatic Warbler conservation seem to be conflicting, in the longer run the interests may converge again.

The LIFE Nature project

In 2005, OTOP-BirdLife Poland together with an international partnership of five NGOs and two national parks from Poland, Germany, and the UK started the EU LIFE Nature project "Conserving *Acrocephalus paludicola* in Poland and Germany" (Fig. 7). The project, with a duration of five years and an overall budget of 5.4 m Euro, is one of the largest and most comprehensive species conservation projects ever implemented in Poland.

The project aims to stabilise the population of Aquatic Warbler in key areas in Poland (eight sites) and Germany (one site). Management plans for all existing and potential habitats of the species in the project sites (42,000 ha) will be set up. About 3,000 ha will be effectively managed to improve ca.1,500 ha of existing Aquatic Warbler habitat and to recreate ca.1,500 ha of new habitat in Pomerania and the Biebrza area. Restoration and management experiences will be used for guiding future management of sites in the same area and beyond.

With land users and conservationists teaming up to conserve the Aquatic Warbler, there is a real chance that in future we may also hear its unique sunset mating song in Pomeranian

peatlands, reminding us that, only 100 years ago, the species was still called the "Sparrow of the mires".



Fig. 7: Logos of the Aquatic Warbler project and the EU LIFE programme.

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