

AN INTRODUCTION TO AQUATIC WARBLER CONSERVATION IN WESTERN POMERANIA

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Abstract: The Aquatic Warbler (*Acrocephalus paludicola*) is a globally threatened bird species. Around 1900, it was one of the most widespread birds in Central-European fen mires. The population severely decreased as a consequence of wetland drainage. Distinct genetic differences to all other known populations suggest that the remaining birds in Western Pomerania are the last survivors of a separated, presumably large Central European population. Its conservation has high priority, but it is hampered by insufficient knowledge on habitat requirements of the species in Western Pomerania. Additional threats emerge from conflicting land use interests.

The coastal sites of the West-Pomeranian population are located around Szczecin bay and consist predominantly of *Phragmites australis* reeds. The sites in Lower Odra valley are situated on both sides of Odra river and have a mixed vegetation of sedges and grasses with *Carex gracilis* and *Phalaris arundinacea* dominating. All current breeding sites in Western Pomerania are being mown. First results of a comparison between sites currently used by Aquatic Warbler and sites recently abandoned show that the latter have a lower water level and a thicker litter layer. A PhD study on Aquatic Warbler habitat requirements and habitat restoration potential in Western Pomerania has recently started. A joint Polish-German EU-LIFE project targeting Aquatic Warbler conservation in Western Pomerania is planned.

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INTRODUCTION

The Aquatic Warbler (*Acrocephalus paludicola*) is a habitat specialist breeding in fen mires and similarly structured marshy habitats. In primeval landscapes it probably bred in mesotrophic or slightly eutrophic open valley fen mires (Aquatic Warbler Conservation Team 1999). Almost all current breeding sites are used for low-intensity agriculture or are influenced at least by accidental burning. The species has an extraordinary breeding system with uniparental care by the female and a mating system varying between promiscuity and polygyny (Schulze-Hagen *et al.*, 1999). Nests are built on the ground. The diet comprises mostly large arthropods (Aquatic Warbler Conservation Team 1999).

The Aquatic Warbler was widespread in Central-European wetlands at the beginning of the 20th century, particularly along river valleys (Schulze-Hagen 1991). Hesse (1910) stated: "*What in particular characterizes the Aquatic Warbler is its commonness... it occurs all over the vast fen mires...*" (translated from German by the authors). The world population severely decreased in the 20th century (e.g. Brandenburg: -99.8% since 1920) as a consequence of wetland drainage and agricultural intensification (Flade in prep.). Currently, the Aquatic Warbler breeds in less than 50 sites in 7 countries. Its world population is approx. 12,000 - 20,000 singing males, of which approx. 90% are concentrated in Polesye/Eastern Poland, and approx. 60% breed in Belarus (Aquatic Warbler Conservation Team unpublished). The latter is regarded as the current core population. The species is classified as vulnerable at a global level (BirdLife International 2000) and listed as vulnerable in the IUCN Red List of Threatened Species (Hilton and Taylor 2000). A Memorandum of Understanding under the Convention of Migrating Species (CMS) concerning conservation measures for the Aquatic Warbler was signed in Minsk in April 2003.

A PhD project aiming at the identification of ecological key properties of Aquatic Warbler habitats and at the elaboration of strategies for habitat restoration has started recently at the University of Greifswald. The project particularly focuses on the breeding sites in Western Pomerania.

THE WEST-POMERANIAN POPULATION

The Aquatic Warbler population in Western Pomerania³ is the smallest in Europe. However, it has a key function for the conservation of the species. Analyses revealed that the West-Pomeranian population is genetically separate from all other studied Aquatic Warbler populations (Giessing 2002). According to isotope analyses of Aquatic Warbler feathers, it has most probably a different, very restricted and more northerly wintering area than the other populations (Pain *et al.*, 2003). These results suggest that the remaining birds are the last survivors of a distinct and probably isolated (large) North-German and West-Polish population (Aquatic Warbler Conservation Team 1999).

³ The term „Western Pomerania“ approximates the Polish voivodship „Zachodniopomorskie“, adjacent German coastal, and German and Polish Odra valley areas.

Monitoring of the West-Pomeranian population has intensified in 2003 and 2004. Leading organisations are the Polish Society for the Protection of Birds (Ogólnopolskie Towarzystwo Ochrony Ptaków, OTOP), the West-Pomeranian Ornithological Society (Zachodniopomorskie Towarzystwo Ornitologiczne, ZTO), the Ornithological Society Schwedt (Ornithologische Arbeitsgemeinschaft Uckermark, OAG).

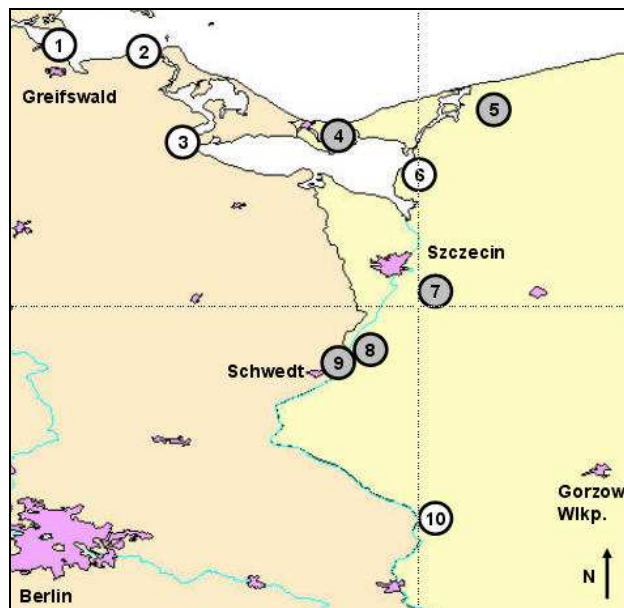


Fig. 1: Past (white) and present (grey) Aquatic Warbler breeding sites in Western Pomerania. 1 = Karrenderfer Wiesen; 2 = Freesendorfer Wiesen / Struck peninsula; 3 = Schadfähre island and Lower Peene valley; 4 = Świna delta; 5 = Rozwarowo; 6 = Szczecin bay; 7 = lake Miedwie; 8 = Landscape Park "Lower Odra valley"; 9 = National Park "Lower Odra valley"; 10 = National Park "Warta mouth".

In contrast to the core population in Polessye / Eastern Poland, which is nowadays relatively stable due to intensive conservation efforts, the West-Pomeranian population decreased sharply in numbers in recent years. The number of singing males in Western Pomerania was 383 in 1991 (Aquatic Warbler Conservation Team 1999), 226-231 in 1997 (Krogulec & Kloskowski 1998), and is currently as low as 77-79 singing males. In 2004, 65 singing males were recorded in the Polish part (OTOP pers. comm.) and 7-9 singing males in the German part (OAG Uckermark pers. comm.) of the West-Pomeranian population. Therefore, the Memorandum of Understanding and Polish and German Action Plans put special attention to research, management improvement, and restoration of Aquatic Warbler habitats in Western Pomerania. Major obstacles for successful habitat restoration are insufficient knowledge on Aquatic Warbler habitat requirements in Western Pomerania. All currently known breeding sites in the area depend on

human use. The habitat requirements possibly differ from the ones of the core population which are well studied (e.g. Dyrz & Zdunek 1993, Kozulin & Flade 1999, Kozulin *et al.*, in prep.). Therefore a vital base for a successful restoration programme must include a sound landscape-ecological analysis of currently used habitats and of the restoration potential of formerly inhabited sites in Western Pomerania.

METHODOLOGY OF THE HABITAT ANALYSIS

Study sites in the Polish and German part of Western Pomerania include a) sites currently populated by Aquatic Warbler, b) sites recently abandoned by Aquatic Warbler (subdivided into less than 5 years and 6-25 years), and c) control sites which are visually suitable and populated by a bird community characteristic for fen mires, but without Aquatic Warbler. In the study sites, vegetation composition, structure, and height, litter properties, water conditions, nutrient conditions in biomass, productivity, physical soil properties, Aquatic Warbler prey composition and availability, landscape structure, and land use will be studied. 62 long-term study plots have been set up in 2004. Data are collected at the very beginning of breeding season, at the peak of the first brood and at the peak of the second brood in the years 2004-2006. For the identification of key factors multivariate analyses (e.g. PCA for data reduction and logistic regression) will be used. Outcomes will be externally validated in a reference area.

Expected outcomes of the PhD study are:

- A detailed description of key habitat factors and parameters facilitating Aquatic Warbler settlement in Western Pomerania.
- A search area map of potential Aquatic Warbler habitats in Western Pomerania.
- A set of management guidelines for currently not populated sites.

Possibly, coastal habitats and habitats in Lower Odra valley also will be analysed separately on a finer scale as a first revision showed distinctly different environmental and management conditions.

COASTAL HABITATS

The current coastal breeding habitats of the West-Pomeranian Aquatic Warbler population are located in the Świna delta (e.g. Kasiborska Kępa) and near the village of Rozwarowo (Fig. 1). According to historical records, Aquatic Warblers have also bred along the German Baltic Sea coast: e.g. on Schadefähre island in the Peene river valley until 1975, on the Karrendorfer Wiesen near Greifswald until 1989, and on the Freesendorfer Wiesen / Struck peninsula near Greifswald from 1973–1997 (Sellin 1990, Helmecke *et al.*, 2003). There are also historical records from several other sites around Szczecin bay (e.g. Rów peninsula, Sellin 1990).



Fig. 2: Aquatic Warbler breeding site on Kasiborska Kępa, Poland. The area to the left is a *Phragmites communis* reed used for summer-cutting, the one to the right is used for winter-cutting. The picture was taken in September 2004 (Photo: Franziska Tanneberger).

The coastal habitats predominantly consist of scantily growing *Phragmites australis* reeds under different types of use: summer and winter cutting reed with sparse sedges (e.g. *A. acutiformis*) at Kasiborska Kępa (Fig. 2), cattle grazed reed in the Świna delta, summer cutting reed hindered by late frosts with a dense *Thelypteris palustris* ground layer at Rozwarowo, cattle grazed brackish grasslands with scattered, low reeds on the Freesendorfer Wiesen (Sellin 1989).

HABITATS IN THE LOWER Odra VALLEY

The currently inhabited Aquatic Warbler breeding sites in the Lower Odra valley are located nearby the Polish Landscape Park “Lower Odra valley”, in the German National Park “Lower Odra valley”, and at lake Miedwie (south of Szczecin). The species bred until recently in the Polish Landscape Park at Międzyodrze and in the Polish National Park “Warta mouth”.



Fig. 3: Aquatic Warbler breeding site in the German National Park “Lower Odra valley”. The picture was taken in June 2004 during fieldwork (Photo: Franziska Tanneberger).

In the Lower Odra valley, Aquatic Warbler breeding habitats have a mixed vegetation of sedges and grasses with as dominant species *Calamagrostis canescens*, *Carex gracilis*, *C. riparia*, and *Phalaris arundinacea* (sites nearby the Polish Landscape Park “Lower Odra valley”) or *Carex gracilis*, *Phalaris arundinacea*, and *Glyceria maxima* (most sites in the German National Park “Lower Odra valley”) (Fig. 3). Some sites in the German National Park “Lower Odra valley” and in the Polish National Park “Warta mouth” almost exclusively consist of *Carex gracilis* reeds. All currently used sites were mown in previous years. Many formerly inhabited but currently abandoned sites are no longer being mown (e.g. German National Park “Lower Odra valley”, Polish Landscape Park “Lower Odra valley”, and Polish National Park “Warta mouth”).

CONCLUSIONS FOR AQUATIC WARBLER CONSERVATION IN WESTERN POMERANIA

First results of a comparison between recently abandoned sites and sites currently used by Aquatic Warbler in Western Pomerania carried out in 2004 show that abandoned sites have:

1. a lower water level;
2. a thicker litter layer;

3. a denser vegetation structure; and / or
4. an earlier mowing date.



Fig. 4: Past Aquatic warbler breeding site in the Polish National Park "Warta Mouth". The *Carex gracilis* litter layer is 30-40 cm thick. The picture was taken in June 2004. (Photo: Franziska Tanneberger)

On the basis of our preliminary results from West-Pomeranian breeding sites and of literature data, the following management recommendations for Aquatic Warbler conservation in Western Pomerania are identified:

1. Water level: A level allowing the species successfully to breed is to be secured. Water table changes during the period from May to August or the water table level prior to the breeding period may be used as water regime indices for Aquatic warbler breeding success. Optimal conditions exist in the range of the core population in mires with water level just at the soil surface (Kozulin and Flade 1999). They need to be identified for West-Pomeranian conditions.
2. Mowing: Sites have to be mown (or possibly grazed) to prevent the vegetation on the coastal sites from becoming too dense and on the river valley sites from becoming overgrown with *Phragmites communis* and bushes. At breeding sites, mowing has to take place after the breeding season. As the Aquatic warbler is the *Acrocephalus* species climbing most intensely through the vegetation (Leisler 1981), a thick litter or hay layer

can make a site unsuitable for the species (Fig. 4). Biomass therefore has to be removed. To make mowing of Aquatic Warbler sites economically attractive, the profitability of biomass use should be investigated.

3. Burning: This management tool is an alternative to mowing/grazing providing also for removal of biomass. In many Aquatic Warbler sites, spring burning is commonly applied to improve hay quality. The impact of fires on the number of breeding birds depends on the time of burning and the groundwater level at that time. According to investigations in Belarus, Aquatic Warbler breeding success drops in the year of burning but increases in subsequent years when the old vegetation is burnt without harming mosses and underlying strata (Kozulin & Flade 1999, Kozulin *et al.* in prep.).

The current practice of either no or early mowing in many former Aquatic Warbler breeding sites in Western Pomerania has led to habitat changes which probably made the sites unsuitable for the species. But for many areas the impact of management on habitat changes are not yet well understood.

In order to improve the management of Aquatic Warbler breeding sites, a joint Polish-German EU-LIFE project „Securing and increasing *Acrocephalus paludicola* populations in key areas of its range in Poland and Germany“ is planned for 2005-2009. This project will include most current and several historical Aquatic Warbler breeding sites in Western Pomerania. The German National Park will be excluded, but a complementary special pilot management project is planned here under a new state funding scheme for maintaining biological biodiversity in rural areas. Main objectives of both projects are the elaboration of management plans for current breeding sites, experimental management for Aquatic Warbler conservation in current and formerly inhabited but currently abandoned breeding sites, and the identification of ways to make biomass use from Aquatic Warbler breeding sites economically attractive.

Additional management problems can emerge from nature conservation itself, as the example of the German National Park „Lower Odra valley“ shows. The Park's breeding population – the last remaining birds of this species in Germany – are threatened as their breeding sites are designated as future strict nature reserves without any land use. According to the National Park concept, compensation is planned by restoring or establishing suitable habitats in zone II areas. In this case, mowing in the designated strict reserves should be continued until alternative breeding sites for Aquatic warbler are sufficiently available, and the species effectively makes use of them.

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