

Protecting Aquatic Warblers (*Acrocephalus paludicola*) through a landscape-scale solution for the management of fen peat meadows in Poland

Lachmann L.^{1,2}, Marczakiewicz P.^{3,2} and Grzywaczewski G.⁴

¹ Royal Society for the Protection of Birds (RSPB), The Lodge, SG19 2DL Sandy, Bedfordshire, United Kingdom

² Polish Society for the Protection of Birds (OTOP), Ul. Odrowąża 24, 05-270 Marki, Poland

³ Biebrza National Park, Osowiec-Twierdza 8, 19-110 Goniądz, Poland

⁴ Lublin University of Life Sciences, ul. Akademicka 13, 20-950 Lublin, Poland

Corresponding author: Lars.Lachmann@rspb.org.uk

Abstract

The fen peatlands of the Biebrza Valley in Northeast-Poland hold 2500 singing males of Aquatic Warblers (*Acrocephalus paludicola*), equalling almost 20% of the world population of this globally threatened bird species. After traditional land use by hand-scything for hay ceased around 1970, successional overgrowth has become the main threat to this habitat, with over 15000 ha affected by 1999. A project funded by the EU LIFE Programme has now catalysed the implementation of a landscape-scale solution for the restoration and sustainable management of these fen peatlands, with almost 2300 ha under regular management by spring 2010. Purpose-built prototype mowing machinery with very low ground pressure and fast working speed is now used across the site. The national park has made 12500 ha of public land available for management under lease agreements that guarantee the benefit for biodiversity. A targeted Aquatic Warbler agri-environment package provides a financial incentive for local farmers and enterprises to take up the lease and implement the management measures. It is expected and there are clear indications that this management approach is benefiting the Aquatic Warbler population, but any final conclusions require additional years of monitoring and further analysis of existing data.

Keywords: Aquatic Warbler, Biebrza, fen mire, successional overgrowth, conservation management, agri-environment programme

Conservation issue

The Biebrza Valley in Northeast-Poland presents one of the most pristine river ecosystems in Europe. Besides extensive wet forests, it holds c. 33500 ha of open habitats in its central parts, much of it near natural fen peatlands. These habitats are of highest international nature conservation importance. Amongst other key species, the fen peatlands hold around 2500 singing males of Aquatic Warblers (*Acrocephalus paludicola*), equalling almost 20% of the world population of this globally threatened bird species, Europe's rarest migratory songbird. Fens are naturally open habitats. Since at least 300 years, they have traditionally been used as hay meadows. Slight man-made changes to the hydrology of the valley, increased eutrophication through water and air combined with slow natural succession of the peatland lead to overgrowth with dense reeds and trees, especially birch (*Betula sp.*), willow (*Salix sp.*) and alder (*Alnus glutinosa*). This process was inhibited by the traditional extensive hand-scything, but became apparent as soon as this type of land use ceased around 1970. After earlier plans of full-scale drainage had been abandoned, eventually resulting in the creation of the Biebrza National Park in 1993, the successional overgrowth has become the main threat to this habitat. According to Matuszkiewicz (1999), over 15000 ha of open habitats were already subject to overgrowth by the end of the millennium. The establishment of the Biebrza

National Park in 1993 could not stop this negative development resulting in increased vegetation height and density.

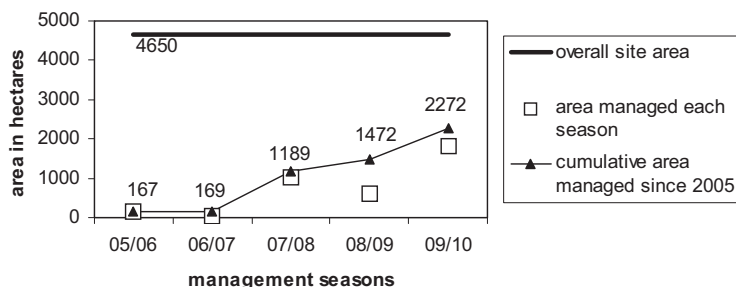


Figure 1. Area covered by conservation management for Aquatic Warblers at Bagno Ławki.

Conservation approach

Since 2005, the Polish Society for the Protection of Birds (OTOP - BirdLife Poland) and partners, amongst them the Biebrza National Park, have been implementing a large-scale project funded by the EU LIFE Programme targeting the conservation of Aquatic Warblers and their fen mire habitats. This project has catalysed the implementation of a landscape-scale solution for the restoration and sustainable management of the peat meadows:

The plan to reintroduce mowing on several thousand hectares within the project facilitated the development and introduction of purpose-built prototype mowing machinery by a contractor of the project. The machine is an adapted alpine piste-basher on caterpillars, originally used for the preparation of ski runs, with very low ground pressure (30 g cm^{-2}) and fast working speed (up to 10 ha day^{-1} , including removal of biomass arisings). As it can be used also during high water levels and – in contrast to previously tested traditional tractors with twin-tires – does not destroy the delicate peat soil and vegetation, it is now used across the site.

In order to secure financial support beyond the project for large-scale habitat management, the project team worked with the government to develop a targeted Aquatic Warbler agri-environment package. Under this programme, users of land occupied by Aquatic Warblers receive an annual payment of 1370 PLN (c. 334 €) per hectare and year if they mow 50-70% each year (the unmown areas rotating each year) after 1 August and remove the arisings from the site. Similar packages are available for fen peatlands not currently holding the species, but with a typical vegetation indicating potential Aquatic Warbler habitat. The programme started in 2009 and is secured until 2013. To enable local farmers and enterprises to implement the necessary habitat management with the support of the agri-environment programmes, the national park has made public land available under lease agreements that guarantee the benefit for biodiversity. By the end of 2009, 4501 ha have been leased out, with contracts in preparation for further 8000 ha. In the near future, infrastructure will be put in place to allow for the energetic use of the biomass harvested, e.g. through the production of briquettes as alternative carbon-neutral fuel. The sale of these biomass products will contribute to the management costs in the future. The largest contiguous area of fen meadows in the Biebrza Valley is called Bagno Ławki (4650 ha). This is the focal area of the LIFE Project. Since 2005, the area of land managed each season at this site has increased, with substantial areas under management since 2007/08 (see Fig. 1), covering almost half the site in 2009/10.

Conservation effect

In 2005 and from 2007-2009, we counted singing male Aquatic Warblers by walking transects through the total area of Bagno Ławki. Every day, multiple observers walked parallel transects simultaneously and noted singing males on a map. We covered the 4650 ha

with 30 parallel transects (counting areas) each year over a period of c. 40 days between late May and early July, and summed the number of singing males recorded during each transect count to estimate the overall total number. We recorded between 1280 and 1981 singing males in Bagno Ławki during the years 2005 and 2007-2009 (Table 1). This number does not provide an estimate of variability, but because the number of recorded males can vary by observer, weather, and singing activity of males, it is reasonable to assume that total numbers are subject to considerable variability. The raw count data reported here must therefore be interpreted with caution, and are not suitable for a final evaluation of the response of Aquatic Warblers to management. A more detailed analysis of the bird data is beyond the scope of the present manuscript and will be presented elsewhere. Because the exact location of each singing male was recorded, we were able to divide the total numbers into numbers for areas that received management at least once during that time period (1472 ha), and those areas that remained without management (3178 ha). On areas that were managed, we recorded between 756 and 846 singing males. We recorded between 742 and 1225 singing males in areas that were not managed (Table 1). During the last season (2009), after the first two years of large-scale management, we recorded a notable increase in the density of singing males in managed areas and a decrease in unmanaged areas, which is an indication for a shift of distribution of the birds towards the areas that received management.

year	2005	2007	2008	2009
unmanaged	1225	785	1026	742
Managed	756	495	595	846
Total	1981	1280	1621	1588

Table 1. Raw count data of singing male Aquatic Warblers on Bagno Ławki from 2005 to 2009, divided into areas that received management at least once during the five years (1472 ha), and

areas that did not receive any management (3178 ha).

Discussion

We showed that it is technically and economically feasible to manage peat meadows in eastern Poland on a large scale. We expect that this management will be beneficial for the Aquatic Warbler population due to the species' known preference for intermediate vegetation height (Tanneberger *et al.*, 2008; Tanneberger *et al.*, 2010) and due to the observed return of singing males to areas after mowing management. To date, our count data do not enable us to draw any final conclusions as to whether the management has resulted in increased productivity or merely a distribution shift in Aquatic Warblers. The bird monitoring so far focused on the number of singing males. For the conservation of the species it is, however, critical that females also prefer these areas for breeding, and that the breeding productivity is higher at the managed sites. We will implement studies to determine the nest density and productivity of Aquatic Warblers in managed and unmanaged areas and their correspondence to the numbers of singing males to evaluate whether the management schemes that we describe in this paper are indeed beneficial for the long-term survival of the species.

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