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Wet-grassland breeding bird conservation in Germany: current status and future perspectives

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The decline of wet-grassland breeding bird populations across Europe, and Germany more specifically, continues unabated. In an effort to address this ongoing issue, we conducted a Horizon Scanning survey to identify the current strengths, weaknesses, future opportunities, and threats for wet-grassland breeding bird conservation across both continental and Atlantic biogeographic regions in Germany. We conducted the survey in 2022 and targeted primarily the community of conservation practitioners. We structured the survey with nine simple questions to identify the profile of the participants and collect their expert opinions. Our results confirm established challenges for bird conservation and bring into the spotlight emerging opportunities and threats. Thus, we summarize here the results of this survey and provide recommendations to decision-makers and stakeholders to work collectively towards the recovery of wet-grassland breeding bird populations in Germany and preserve grassland biodiversity for future generations.

KEYWORDS

meadow birds conservation, waders conservation, East Atlantic Flyway, biodiversity conservation, Horizon Scanning

Introduction

Wet-grassland breeding birds, or wet-meadow breeding birds, are a diverse assemblage of species that includes primarily passerines (Passeriformes), waterfowls (Anseriformes), and waders (Charadriiformes). Populations of wet-grassland breeding birds sharply and alarmingly declined across Europe in the past decades (Thorup, 2000; Wilson et al., 2004; Roodbergen et al., 2012). This ongoing decline is the result of a combination of factors, including 1) the loss of suitable breeding habitat due to the lowering of water tables intended to increase arable land productivity (Newton, 2004; Eglington et al., 2010). 2) The generalized destruction of clutches and loss of chicks because of early cropping and

mowing practices, amplified by the extensive use of heavy agriculture machinery (Vickery et al., 2001; Tome et al., 2020). 3) The loss of habitat heterogeneity due to widespread monocultures that have direct consequences on plant and insect biodiversity (Krause et al., 2011; Kentie et al., 2013). 4) The decrease in food quality and quantity for chicks due to the generalized use of fertilizers and pesticides (Beintema et al., 1990; Schekkerman and Beintema, 2007). And 5) the increased predation of eggs and chicks due to high densities of predators in degraded grasslands (Kentie et al., 2015). Those are the main established drivers of the decline of wet-grassland breeding bird populations widely acknowledged by the scientific community and the community of nature-conservation practitioners.

Germany is no exception to the loss of wet-grassland biodiversity. Overall, trends of grassland bird populations continue to decline across Germany (Kamp et al., 2021; Krüger and Sandkühler, 2022) driven by an ever-increasing intensification of agricultural (Jerrentrup et al., 2017; Deutsche Ornithologen-Gesellschaft, 2019; Busch et al., 2020). This alarming, and still accelerating, decline in populations of wet-grassland breeding birds is due to the same reasons listed above. For example, the breeding populations of flagship species like the Northern Lapwing *Vanellus vanellus* (Figure 1) decreased by more than 80% between 1990 and 2018 (Kamp et al., 2021).

We present here the results of an extensive Horizon Scanning survey carried out in Germany, specifically aimed at the broad and diverse community of nature-conservation practitioners. We present the results in two distinct sections—current status and future perspectives— and we emphasize the urgent need for action. We hope that this manuscript serves as a powerful call to engage in more sustainable agricultural practices and unite efforts and financial means for the conservation of wet-grassland breeding birds. By doing so, we have the opportunity to prevent the irreversible decline of wet-grassland breeding bird populations across Germany and Europe.

The Horizon Scanning survey

We conducted a Horizon Scanning (HS) survey to identify the strengths, weaknesses, opportunities, and threats for wet-grassland breeding bird conservation in Germany. HS has become an important tool for conservation practitioners, policymakers, and scientists to prioritize management or research efforts and identify new areas of inquiry (Sutherland and Woodroof, 2009; Sutherland et al., 2011). We conducted the HS online using www.surveyplanet.com, and included nine questions in total. In the first five questions, we asked participants to 1) identify themselves; 2) Provide the geographical extent of their expertise in four categories (Schleswig Holstein and Hamburg, Lowers Saxony and Bremen, North Rhine-Westphalia, and the continental biogeographic region of Germany). The first three categories represent states majoritarily in the Atlantic biogeographic region of Germany where the main populations of wet-grassland breeding birds occur. 3) Describe their main field of activity in one of the eight pre-set answers (Conservation, Land Management, Agriculture, Rice farming, Research, Monitoring, Environmental policy, Education and capacity building; 4) describe their main expertise in one of the seven pre-set answers (Ornithology, Wetland and wet-grassland ecology, Flyway ecology, Agriculture, Rice farming, Social ecology, Environmental economics; and 5) to self-identify their level of expertise in three categories (beginner, intermediate, advanced). In questions 3 and 4, rice farming was included as this HS is part of a larger survey targeting the entire East Atlantic Flyway. Further, participants had also the opportunity to provide write-in answers not provided in the questionnaire. The last four questions simply asked the participants to describe, from their point of view, the strengths, weaknesses, opportunities, and threats for wet-grassland bird conservation in the area of their geographical expertise, respectively. We asked participants to provide answers in the format of their choice, as an essay, independent sentences, or bullet points. We conducted the

FIGURE 1
Photograph showing an adult Northern Lapwing *Vanellus vanellus* in a wet grassland, Dümmer SPA. Photo credit: Christopher Marlow.

HS for 6 months and the participants had the opportunity to provide their answers in English or German. The HS targeted only professionals. Initially, we invited 150 nature conservation practitioners working on wet grasslands and wet-grassland bird conservation, management, and monitoring from all over Germany to participate. We also advertised the survey in all major gatherings, workshops, and events dealing with bird conservation in Germany that took place in 2022. Further, participants were asked to distribute the HS survey to their colleagues, and other professionals implicated directly or indirectly in wet-grassland management (e.g., farmers, decision-makers).

In total, 76 conservation practitioners participated in the HS for Germany. Those were eight from Schleswig Holstein and Hamburg, 33 from Lowers Saxony and Bremen, 13 from North Rhine-Westphalia, and 22 from the continental biogeographic region. We summarized the results of the HS and distributed the results to the participants who had two weeks to provide comments on the summary. Further, we organized separate online workshops for each of the four geographical categories as divided for this study, and we conveyed all participants to finalize the results and discuss and resolve any remaining issues. In Appendix 1, we provide a description of the participants and the detailed results of the HS in English and German. We invite the readers to read the entire results provided in Appendix 1 as they can provide additional information.

The current status of wet-grassland breeding bird conservation in Germany

Overall, wet-grassland breeding bird conservation in Germany benefits from significant assets. There are competent human resources, including volunteers, across the entire territory with an active network of nature conservation, biological, and ecological stations. Usually, these stations have clear mandates for bird population monitoring, coordinating the management of conservation areas with farmers and local authorities, communicating and engaging with the local communities, and planning and implementing maintenance and conservation measures. This territorial implementation resulted in a good knowledge of species occurrences and population status in most of the important Special Protection Areas (SPAs). Further, wet-grassland bird conservation benefits from a multitude of tools adapted to private and publicly owned land, among those, agri-environmental-climate measures (AECMs) providing financial support to farmers to contribute to the protection or enhancement of biodiversity. However, the efficacy of measures implemented on private agricultural land (e.g., arable land and pasture grassland) is debatable and widely criticized among the conservation community. Often, case studies differ greatly and there is a wide consensus that AECMs need to be revised and better adapted to the protection of grassland breeding birds. The most efficient and sustainable measures for the conservation of wet-grassland breeding birds are implemented on publicly owned land that is often, with few exceptions, made available to optimize the water-table levels fundamental for the conservation of wader species. While efficient measures can be implemented on publicly owned land, this solution alone cannot halt the decline of bird populations across Germany.

Intensive agriculture leading to homogeneous grasslands, extensive use of fertilizers and pesticides, and frequent and heavily mechanized mowing are the direct cause of the decline of wet-grassland breeding bird populations across Germany. This is sustained by 1) a lack of willingness of the broader agricultural sector to engage in more sustainable use of wet grasslands and 2) European subsidies awarding primarily high productivity at the expense of biodiversity and the sustainable use of natural resources. The current agricultural practices constitute the major obstacle to bird conservation in Germany. The principle of voluntariness for farmers to engage in bird-friendly farming practices does not provide sufficient incentive to shift toward more sustainable and bird-friendly agriculture. Further, authorities do not impose sufficient restrictions to support bird conservation and the few conservation areas where bird populations are stable are often small and deprived of buffer zones separating them from intensive agriculture. Habitat fragmentation and conservation activities that are limited to a few core areas hinder the conservation of widespread species like the Northern Lapwing *Vanellus vanellus* and expose the few remaining source populations to high risks of extinction.

Conservation efforts are increasingly facing growing populations of mammalian and avian predators. Indeed, the breeding successes of many wet-grassland breeding birds are currently hindered by high predation rates. Mammalian predator populations, including introduced species, are excessively high across all agricultural land. Some predator control measures, like hunting, are often controversial. Passive predator control measures (including fencing and exclosures), are widespread but costly and difficult to apply to large areas.

Overall, wet-grassland bird conservation suffers from a lack of a nationwide strategy. Many individual projects are being implemented across the country; however, there is no overarching framework for wet-grassland breeding bird conservation. In a few cases where conservation efforts have been successful, funding for the implementation of conservation measures is often project-dependent. This unreliability of funding needed for conservation is an additional challenge for long-term strategies where funding gaps for the implementation of measures must be avoided. Often conservation measures consist of immediate short-term actions (e.g., nest protection) instead of long-term solutions like the development of more holistic sustainable practices to recover wet-grassland habitats. The low awareness of the urgency of wet-grassland breeding bird conservation among stakeholders and decision-makers is alarming.

Other hurdles for conservation have been identified, including 1) high local and regional recreational pressures (e.g., along the Rhine floodplain). 2) Decreasing interest of farmers to practice low-intensity and bird-friendly grassland management in nature conservation areas because of little financial compensation and support. 3) Bureaucratic obstacles in accessing European, federal,

and state funding, and 4) regulatory obstacles where conflicting regulations between water rights and land consolidation laws hinder the implementation of conservation measures.

Future perspectives for wet-grassland breeding bird conservation in Germany

Acknowledging the current problems hindering the conservation of wet-grassland breeding birds is fundamental, however, identifying future opportunities and threats is indispensable to tackling upcoming climatic, social-economical, and societal challenges. We attempt here to present the future opportunities and threats for wet-grassland breeding bird conservation as perceived by the community of conservation practitioners.

The ongoing debate on climate change, its implications for both agriculture and nature conservation, and the associated measures that need to be deployed to mitigate its effects on our ecosystems and societies are seen across Germany as an opportunity to rethink policies, agricultural practices, and nature conservation. This was clearly a common topic across all states in the continental and Atlantic biogeographic regions of Germany. Increasing drought periods brought back the subjects of peatland restoration, rewetting of fen soils, waterlogging, impoundments, and water retention to the front row. This is an opportunity that has the potential to significantly benefit the conservation of wet-grassland breeding birds if addressed correctly, and synergies between climate change mitigation measures and bird conservation should be developed. It is well known that major funding from the European Commission and the German Federal Government is, and will continue to be, mobilized to halt the effects of climate change and to transition towards a decarbonized society. The nature conservation community sees this as an opportunity to join efforts and deploy measures that benefit both nature conservation and climate change mitigation. Wet-grassland breeding birds should be direct beneficiaries of the restoration of wetlands and wet grasslands when restoration measures are implemented adequately to restore and recover biodiversity.

Further, the increased water scarcity for agriculture creates an additional incentive to rethink agriculture and water management practices in wet grasslands. Public opinions have also shifted. The increased recognition by the public of the need to restore wet grasslands to mitigate the effects of climate change combined with the desire for ecological agriculture are opportunities to transform current agricultural practices. Undoubtedly, consumers are more critical of the environmental footprint of agricultural products.

Change is also being noticed through stronger political commitments towards nature conservation and more specifically towards wet-grassland breeding bird conservation. This was the case in Lower Saxony, North Rhine-Westphalia, and Schleswig-Holstein where noticeable changes occurred lately and constitute an encouragement to advance bird conservation and wet-grassland habitat recovery.

Other opportunities to advance wet-grassland breeding bird conservation include 1) the ongoing cooperation among neighboring states that still need to be strengthened. 2) The intensification of efforts to restructure the Common Agricultural Policy (EU-CAP) to promote and support low-intensity agriculture and increase funding instruments for nature conservation. And, 3) the continuous pressures from the European Commission and the Federal Government of Germany to implement more concrete conservation measures with clear quantitative targets.

Climate change is undoubtedly considered a major threat to wet-grassland breeding bird conservation. Fewer and delayed precipitations and extended drought periods are already being observed across Germany. Competition for water allocation between nature, agriculture, and society is expected to increase in the near future. The combination of these factors creates major challenges to maintaining suitable breeding habitats for many wet-grassland breeding bird species. The unabated lowering of water tables will lead to an even more generalized water crisis in wetlands and wet-grasslands as groundwater levels are excessively kept low and are not recovering. Water is critically lacking in many wetlands of the Atlantic biogeographic region of Germany, while more water should be kept in the landscape for longer periods, e.g., in backwater habitats and overflow structures. Further, a major threat for the future is that water shortages might be again addressed primarily with technical solutions for agriculture and society and not with sustainable nature-based water management approaches.

The energy transition is increasing the demand for large photovoltaic and wind power plants, as well as associated power lines and infrastructure. The development of renewable energy is a challenge for wet-grassland breeding bird conservation as competition for land is expected to increase, and permanent grasslands often end up by being selected to construct such power plants. Connectivity between the remaining protected areas is increasingly threatened creating additional hurdles for maintaining viable breeding populations. The current political guidelines often prioritize the expansion of renewable energies on bird protection and sensitive bird habitat conservation.

Intensive agriculture, identified previously as the main factor behind the current decline of wet-grassland breeding bird populations, is still considered a major future threat to conservation. The intensification of agricultural practices continues unabated. The acceleration of structural changes in the German farming industry where smaller farms are being consolidated and replaced by larger ones will have major consequences on the intensification of productivity and therefore on the ability to implement bird conservation measures. Further, many farming activities are now being assigned to contractors who are less considerate of bird conservation. This agriculture intensification, producing degraded landscapes, is fueling the expansion of predators.

Additionally, other future threats to the conservation of wet-grassland breeding bird conservation have been identified including 1) the expansion of the distribution of the wolf *Canis lupus*, which is increasingly challenging the presence of free-roaming livestock on grasslands necessary to maintain open landscapes, with short vegetation, suitable for the reproduction of grassland breeding birds. 2) The deprioritizing of conservation measures against new challenges that can utterly jeopardize conservation efforts. For example, in the context of the ongoing war on Ukraine, global

food supplies have been challenged and a general movement to maintain, and even increase, agricultural productivity has been engaged. This contradicts advocacy for low-intensity agricultural production and highlights the threats of deprioritizing conservation efforts. 3) The increasing loss of attractive flagship species, like the Eurasian Curlew *Numenius arquata*, jeopardizes the conservation of wet grassland breeding birds in general. Flagship species are important for communicating conservation concerns to the public.

Discussion

We present here an overview of the current strengths and weaknesses, and future opportunities and threats for wet-grassland breeding bird conservation as formulated by the wider nature conservation community. Without any surprises, the Horizon Scanning results confirm the predominant detrimental impact of agriculture intensification on wet-grassland breeding bird populations (see, Rigal et al., 2023). Participants from across the continental and Atlantic biogeographic regions in Germany identify intensive agricultural practices and predation to be major drivers of the decline of bird populations and consider intensive agriculture to be the main threat to the future of bird conservation. This is accompanied by major concerns about the consequences of climate change on wet grassland and wetland availability, and upcoming conflicts over water allocation that will arise between nature conservation, agriculture, and society. Without addressing these major challenges and reforming the subsidies provided to the agricultural sector to encourage more sustainable and bird-friendly practices, the future of wet-grassland bird conservation in Germany is very gloomy.

Overall, the expressed opinions were relatively homogeneous across states in the Atlantic and continental biogeographic regions. It is however noticeable that participants for Schleswig-Holstein, Lower Saxony, and North Rhine-Westphalia designate the ongoing strong political support to wet-grassland bird conservation as an opportunity for a brighter future. The energy transition toward a more decarbonized society, while urgent and necessary, is considered across Germany as a challenge that might have negative repercussions on wet-grassland bird conservation. Competition for space to build wind and solar power plants, and related infrastructure, will increase. This is an honest plea to decision-makers to consider nature conservation requirements when developing new strategies for this energy transition.

Emerging opportunities and a positive outcome can still be achieved as Germany benefits from a substantial widespread and dynamic network of conservationists and institutional implementation across its territory. These valuable capacities can only be encouraging to the ability of the German conservation community to bend the curve of wet-grassland bird species decline. High hopes have been communicated regarding the opportunities to develop synergies between climate change mitigation measures and bird conservation. This opportunity should not be missed as it provides both scale and funding to make a significant and durable change for wet-grassland bird conservation. Further, wet-grassland breeding bird conservation in Germany will benefit most from a nationwide strategy. Such a strategy will provide a framework to guide and align objectives, mutualize efforts, and facilitate the development of project consortia. A societal change is in motion and societies and consumers are increasingly aware of their environmental footprint. These are all encouraging opportunities to move bird conservation forward and recover wet-grassland biodiversity.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary Material. Further inquiries can be directed to the corresponding author.

Author contributions

AM designed the concept and wrote the first draft of the article. AM and AB conducted the Horizon Scanning survey. All authors contributed to the article and approved the submitted version.

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Conflict of interest

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fcosc.2023.1242450/full#supplementary-material

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