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Meadow Bird Conservation in the Netherlands

Current Status and Future Perspectives

NLWKN

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Title photo by C. Marlow, Black-tailed Godwit *Limosa limosa*

I. Table of contents

II. List of abbreviations

AES	Agri Environmental Scheme
ANLb	Agrarisch Natuur- en Landschapsbeheer
HS	Horizon Scanning (Survey)
NLWKN	Niedersächsischer Landesbetrieb für Wasserwirtschaft, Küsten- und Naturschutz
NNN	Natuur Netwerk Nederland
TBO	Terrein Beherende Organisatie

III. Figure Index

Abstract

Meadow birds are culturally significant in the Netherlands and play a key role in the ecosystem. Nevertheless, meadow bird populations such as the Black-tailed Godwit and Common Redshank are in steep decline in the Netherlands. The Lower Saxony Water Management, Coastal Protection and Nature Conservation Agency (NLWKN) conducted a horizon scanning (HS) survey in 2023, with the goal to identify the strengths, weaknesses, opportunities and threats for meadow bird conservation in the Netherlands. In this paper, we analyse and group participants' responses into themes by order of importance. According to our analysis of the HS survey, the strengths for meadow bird conservation include supportive society (high public interest, high volunteer engagement, strong cultural links, effective farmer engagement), eco-friendly agriculture, collaboration (stakeholder collaboration, farmer collectives), and effective financial and subsidy management (ANLb, effective use of funding, long term planning). The weaknesses identified include habitat loss (agricultural intensification, fragmentation, desiccation, increased urbanisation), poorly structured ANLb, weak societal engagement, insufficient collaboration, constant predation pressure, and poor political decision-making (political stagnancy, current agricultural revenue model). Opportunities include improving political decision-making (at local, national, and EU level), extensification of agriculture, improving financial and subsidy management (improvement of schemes, improvement of funding, alternative revenue model), more efficient predation management, improving collaboration between stakeholders, and maintaining societal involvement. Threats include continuing habitat loss (agricultural intensification, fragmentation, increased urbanisation, desiccation, and climate change), increasing predation pressure, misguided political decision-making, and lacking cohesion between funding schemes. These results reflect the complex and nuanced field of meadow bird conservation, focusing on the most important themes of agricultural intensification, subsidy management, predation pressure, political decision making, and societal involvement.

1 Introduction

The populations of meadow birds, also known as wet-grassland breeding birds, are declining rapidly across Europe, particularly in Germany and the Netherlands (Roodbergen et al., 2011). From 1980 to 2020, there has been a decline of 57% in meadow bird species in Europe (BirdLife International, 2022). These declining trends are indicative of larger global trends: according to the International Union for Conservation of Nature (IUCN) Red List, nearly half of all bird species worldwide are in decline (BirdLife International, 2022).

The decline of meadow bird populations is evident in the diminishing numbers of species such as the Black-tailed Godwit, Common Redshank, Northern Lapwing, and Eurasian Oystercatcher (See Figure 1, de Jong et al., 2023). Black-tailed godwits, a keystone species and the national bird of the Netherlands, have decreased from 120,000 in 1972 to 30,000 in 2020 (Aanvalsplan-Grutto, 2020). Despite conservation efforts, none of these species has a favourable conservation status in the Netherlands (de Jong et al., 2023).

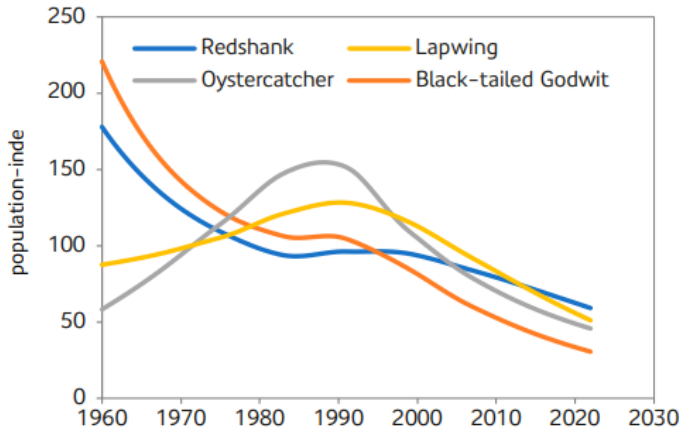

Figure 5: Population trends of meadow bird species in the Netherlands. After de Jong et al., 2023

1.1 Main Causes of Meadow Bird Decline

Agricultural intensification and urbanisation are the main threats to meadow bird populations in the Netherlands (Kentie, 2016). The Netherlands is one of the world's largest agricultural producers in the world (Ministry of Agriculture, Nature and Food Quality, 2023). This comes with several consequences to the environment and to meadow bird populations.

One of the consequences of the intensification of agriculture is the pollution of meadow bird habitats. The use of fertilisers and pesticides has harmful effects on biodiversity including insect levels, resulting in reduced food availability, decreased suitable nesting habitat and direct mortality for meadow birds (Deru et al., 2023). The pesticides are often dispersed during the nesting time exposing chicks to these toxins (Sánchez-Bayo, 2011). In addition, excesses of pesticides and fertilisers will runoff into the ground and surface water, polluting water sources, and therefore, entering into the system of meadow birds (Fraters et al., 2021).

Earlier mowing has also led to the destruction of nests and the death of chicks (Roodbergen et al., 2012). Climate change causes soils to warm up earlier in the year, leading to the faster growth of grass (Jacobs, et al., 2015). Therefore, the optimal mowing days have shifted by more than a month earlier during the last century (Kleijn, 2010). With the intensification of agriculture and increased mechanisation, mowing days have also shortened as farmers cut the grass faster and more efficiently

(Bos et al., 2013). Müller et al. (2004), found out that earlier mowing did not reduce the population size of meadow birds, but lowered the reproductive success. This in turn, led the population size to shrink.

Another reason for the decline of meadow birds is the reduction and fragmentation of habitat (Van der Vliet et al., 2003). The semi-natural grassland areas decreased from 40% of land cover to 3% nowadays (van Strien et al., 2019). Van der Vliet et al. (2010) conducted a study on how different landscape elements influence the breeding distribution of meadow birds and discovered that the largest disturbance for meadow birds are highways and related noise pollution. Noise pollution from cars, planes, and machinery hinders the communication between birds which may lead to reduced feeding opportunities for chicks, therefore reducing reproductive success (Lucass et al., 2016).

Furthermore, predation is a leading cause of declining bird populations (Teunissen et al., 2006). Based on the research that Teunissen et al. (2006) conducted in the Netherlands for four years, observations of missing chicks are estimated to be 60-80% due to predators, 5-15% killed by agricultural activities such as mowing, and 10-15% died due to other causes. Some examples of predators are foxes, mustelids and intermediate-sized birds such as corvids (Suvorov et al., 2014). In the examined locations of the study, 60% of all reproductive losses of Black-tailed Godwits are from predation. Likewise, predation on chicks was more prominent than nest predation (Teunissen et al., 2006).

Lastly, lower groundwater levels have also caused reductions in meadow bird populations (Kentie, 2015). Traditional canals and foot drains have been replaced by below ground drainage pipes, increasing the artificial management of low water levels (Kentie, 2015). Meadow birds require herb-rich polders with high groundwater levels where there is an abundant number of worms (Groen, 2012). These large areas of previously suitable habitat have been degraded. This desiccation of habitat leads to reduced food availability for meadow bird chicks and is one of the main reasons for the decline in their reproductive success.

1.2 Current Solutions and Schemes Addressing Meadow Bird Decline

1.2.1 Agri-Environmental Schemes

To increase sustainability in the agricultural sector, agri-environmental schemes (AES) were introduced by the EU's Common Agricultural Policy (CAP). Under AES, farmers are encouraged to implement environmentally friendly practices on their farms by being offered a compensation payment (Thierman et al., 2023). AES are implemented across several EU member states using different methods of organisation and disbursement (Roodbergen & Teunissen, 2014). In the Netherlands, AES schemes are called Agrarisch Natuur en Landschapsbeheer (ANLb). They are managed collectively for farmers by the Dutch national organisation, Boerennatuur. The farmer collectives come together to create management strategies that are in line with the local government objectives. Once they are approved, a six-year contract is established with the local government and a private contract with the farmer-members (Thierman et al., 2023). Within ANLb, nest protection has been the most popular conservation action. In 2012, around 9,000 volunteers found and protected 83,000 nests (Roodbergen & Teunissen, 2014).

1.2.2 Grutto Attack Plan

The Grutto Attack Plan aims at protecting meadow areas through a consortium of stakeholders, including provinces, nature organisations, farming associations, and conservation groups. Opportunity areas under the Grutto Attack Plan, which total at least 1,000 hectares each, are envisioned as havens for meadow birds, particularly focused on extensive nature-friendly dairy farming (Aanvalsplan-Grutto,

2020). Crucially, these areas must remain open, with minimal infrastructure and without trees or shrubs, to provide ideal conditions for breeding and reduce predator cover (Aanvalsplan-Grutto, 2020).

The execution of the plan is phased, with the identification of opportunity areas already underway. By forging partnerships with various stakeholders and allocating approximately €70 million for meadow bird conservation until 2027, the plan aims to expand to around 35 opportunity areas (Aanvalsplan-Grutto, 2020). However, transitioning to an agricultural model that prioritises nature conservation over intensive farming poses economic challenges for farmers. Therefore, the plan emphasises the importance of long-term management contracts with increased compensation for ANLb schemes, targeting high-intensity agricultural practices that are not conducive to meadow bird conservation. Exploring alternative income sources, such as carbon pricing in peatlands and higher milk prices, is also on the agenda. Ultimately, the Grutto Attack Plan underscores the need for fair compensation for farmers engaged in nature-friendly agriculture (Aanvalsplan-Grutto, 2020). By reimagining the profit model and ensuring adequate financial support, farmers can be incentivized to embrace sustainable practices, safeguarding not only the godwit but also the agricultural landscapes for future generations.

1.2.3 Natuur Netwerk Nederland

Natuurnetwerk Nederland (NNN), or Nature Network the Netherlands, is an agreement between the national government and the provinces. It aims at connecting natural areas with each other and surrounding agricultural lands. This is being done based on three pillars: enlarge, strengthen and connect. The first pillar focuses on increasing the amount of protected natural areas, the second focuses on improving the resilience of existing nature reserves and the last pillar focuses on the connections between nature reserves (Noord-Holland, 2023).

The provinces are responsible for the NNN on land, the state is responsible for the larger bodies of water: The North Sea, the Wadden Sea, the Eems-Dollard, the IJsselmeer area, the Southwestern Delta and the large rivers (Ministerie van Algemene Zaken, 2023). NNN started in 1990 and is projected to run until 2027.

1.3 Research Question

Given the alarming situation surrounding meadow bird populations, it is crucial to analyse and assess the conservation efforts currently in place. In this paper we analyse and interpret the results of a Horizon Scanning (HS) survey conducted in 2023, with the goal to identify the strengths, weaknesses, opportunities and threats for meadow bird conservation in the Netherlands. The survey was conducted by the Lower Saxony Water Management, Coastal Protection and Nature Conservation Agency (NLWKN). The NLWKN is a department of the state in Lower Saxony, Germany, founded in 2005. The survey was conducted in the framework of the LIFE-IP GrassbirdHabitats (www.grassbirdhabitats.eu), which is an EU-funded project dedicated to protecting meadow birds and their habitats with the goal to create and connect optimal breeding and non-breeding areas along the East Atlantic Flyway.

The results of the survey can provide valuable insights into the current status and future perspectives of meadow bird conservation. This can help in prioritising management and research efforts, identifying new areas of inquiry, and developing strategies to address the challenges facing meadow bird populations. Additionally, the survey provides a comprehensive overview of the expertise and opinions of conservation practitioners, which can guide coordinating conservation activities and engaging with stakeholders to unite efforts and financial means for the conservation of meadow birds in the Netherlands (Maasri et al., 2023).

The research questions addressed in this report are: What is the current status (strengths and weaknesses) and what are future perspectives (opportunities and threats) for bird conservation in the

Netherlands? Our aim is to accurately and succinctly represent the views of the various respondents who completed the survey. It is important to analyse a broad range of strengths, weaknesses, opportunities, and threats in order to make informed decisions about appropriate strategies towards meadow bird conservation.

2 Methodology

2.1 Horizon Scanning Survey

Horizon scanning (HS) is a systematic approach for identifying emerging threats and opportunities that are currently poorly recognized (Sutherland & Woodroof, 2009). It involves grounding future possibilities within a thorough understanding of the present and seeking out early signs of key developments. The process is aimed at assisting decision-makers in producing strategies and plans that are flexible and adaptable to a range of possible plausible futures (Sutherland & Woodroof, 2009). HS has been undertaken for several different fields such as medicine, epidemiology, business, as well as threats and opportunities in shorebird conservation (Sutherland et al., 2012).

The foundation of our research is a HS survey conducted by the NLWKN in 2023. The goal is to identify strengths, weaknesses, opportunities, and threats for meadow bird conservation in the Netherlands. Respondents were asked to describe their main field of activity (nature conservation, land management, rice farming, research, monitoring, environmental policy, education, and capacity building, or other), their main expertise (ornithology, wetland and wet grassland ecology, flyway ecology, agriculture, rice farming or other), and their level of expertise (beginner, intermediate or expert). Respondents were then asked what qualifies as strengths and weaknesses for grassland breeding bird conservation, and what qualifies as opportunities and threats. Opinions were provided as free text with no restrictions or specific instructions. The survey was initially sent out to 90 respondents. Of those, 31 respondents completed the survey.

The HS survey conducted by the NLWKN was shared with us only for the purpose of conducting this research. The NLWKN followed standard ethical procedures during the collection, storage, and sharing of the data. The identity of each respondent in the Horizon Scanning survey is anonymous. The information which they have provided through the survey is strictly confidential.

A limitation we encountered is that the HS survey was mainly distributed amongst a network of conservation experts. Most of the respondents' main field of activity was conservation, while a smaller proportion of respondents were active in land management, monitoring, agriculture, and other (see figure 3). Therefore, the survey and subsequent results are limited by not sufficiently representing the views of farmers, policy makers, land managers and monitoring professionals. Furthermore, most of the respondents of the survey did not provide extensive answers. Many respondents referred to very broad issues without sufficient context or detail. As a consequence, there is the risk that our interpretation of the data lacks depth and relevance. Although the Horizon Scanning process included an opportunity for respondents to confirm our interpretation of the results, few of the respondents participated in this data validation process.

2.2 Thematic Analysis

Thematic analysis is a widely used qualitative research method that involves extracting and analysing the themes which make up a specific text/interview/media containing the perspectives of individuals. Thematic analysis is used across several disciplines such as psychology (Braun & Clarke, 2006), business and management (Heracleous & Fernandes, 2019), and conservation studies (Sterling

et al., 2017). The literature describes two main methods of performing a thematic analysis. These are a top down/deductive approach vs. a bottom up/inductive approach (Braun & Clarke, 2006; Castleberry & Nolen, 2018; Ryan & Bernard, 2003).

Our methodology is based on the inductive approach, meaning that we did not establish any themes before starting the text analysis. The themes emerged from the text through a step-by-step process (see Figure 2).

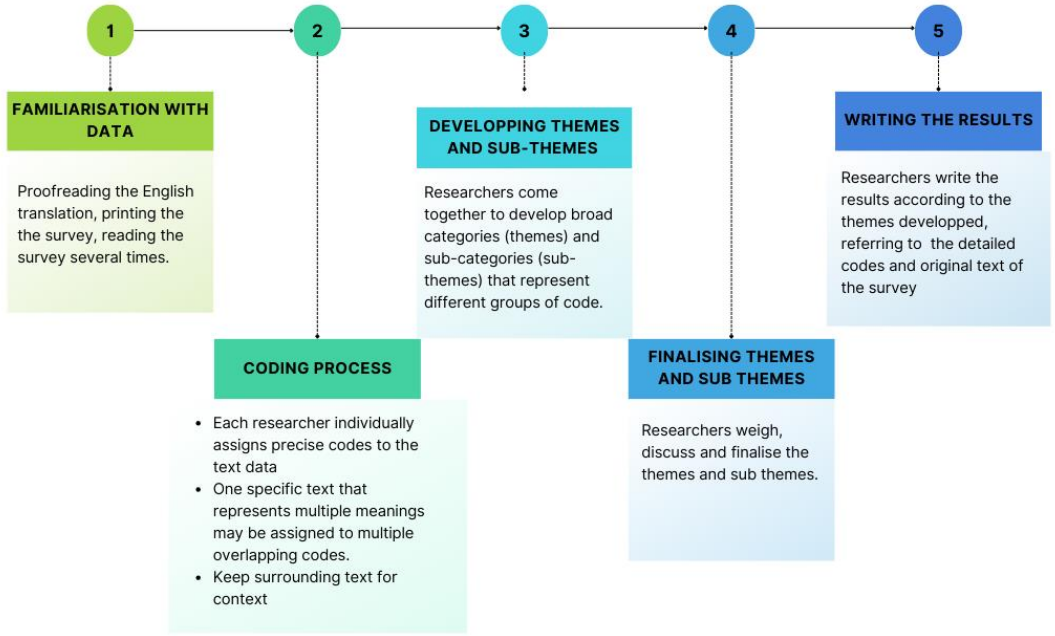

Figure 6: Step by step process used for our inductive thematic analysis

First, we familiarised ourselves with the data from the survey. We did this by thoroughly reading the answers individually, multiple times. Each researcher then coded the data. Coding consists of manually organising and labelling the text data into categories. Each quote from the text that represents one concept or specific topic is assigned to a respective category, or code. These codes were then arranged into more general sub-themes and themes using QDA Miner Lite software. The software enabled us to calculate the frequency of each code, sub-theme and theme. In this way we were able to categorise the main themes of the survey into 'Most Important' (frequency level > 14), 'Moderately Important' (frequency level 7 - 14) and 'Less Important' (frequency level < 7). These levels of importance were assigned in reference to the number of respondents (31) of the survey and a qualitative judgement on behalf of the researchers. See figure 4, 5, 6, and 7 for the results of the themes and subthemes annotated with frequency levels. See the results section for a detailed explanation of the results organised by their importance level. We did not assign levels of importance to the sub-themes to avoid unnecessary complications. In general, this approach enables us to organise and analyse a wide range of perspectives from our survey data while assigning a level of importance to the various themes that emerged.

The limitations to this inductive analysis approach include the risk of producing a set of overly generalised results that fail to preserve the details of the responses. On the other hand, we risk producing results that are overly detailed and specific. We strive to achieve a succinct, precise, and compact middle ground. To conclude, the inherent nature of our analysis relies on the interpretation of the researchers. As we have limited experience in the field of meadow bird conservation, this could pose a challenge.

3 Results: Respondent Profile

Respondents represented various actors and stakeholders active in bird conservation (see Figure 3). The main field of activity of the respondents is nature conservation (13), followed by land management (3), agriculture (3), research (3) and monitoring (3) (Figure 3, Graph 1). The main expertise of the respondents is ornithology (12), wetland and wet grassland ecology (10), and agriculture (4) (Figure 3, Graph 2). Out of a total of 31 respondents, 16 of the respondents describe their level of expertise as expert, 14 as intermediate, and one describe their level of expertise as beginner (Figure 3, Graph 3).

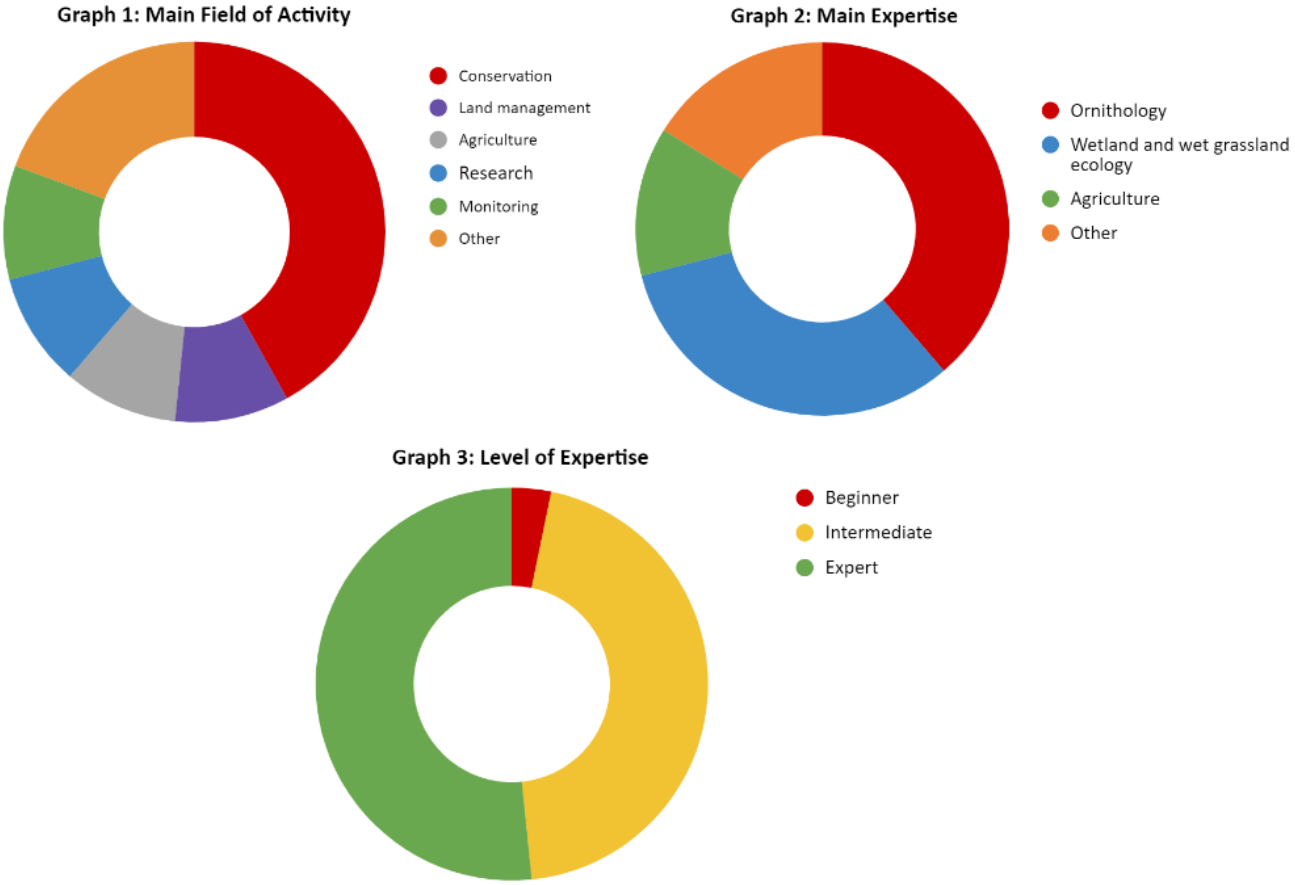

Figure 7: Respondents´ main field of activity, main expertise, and level of expertise

4 Results: Thematic Analysis

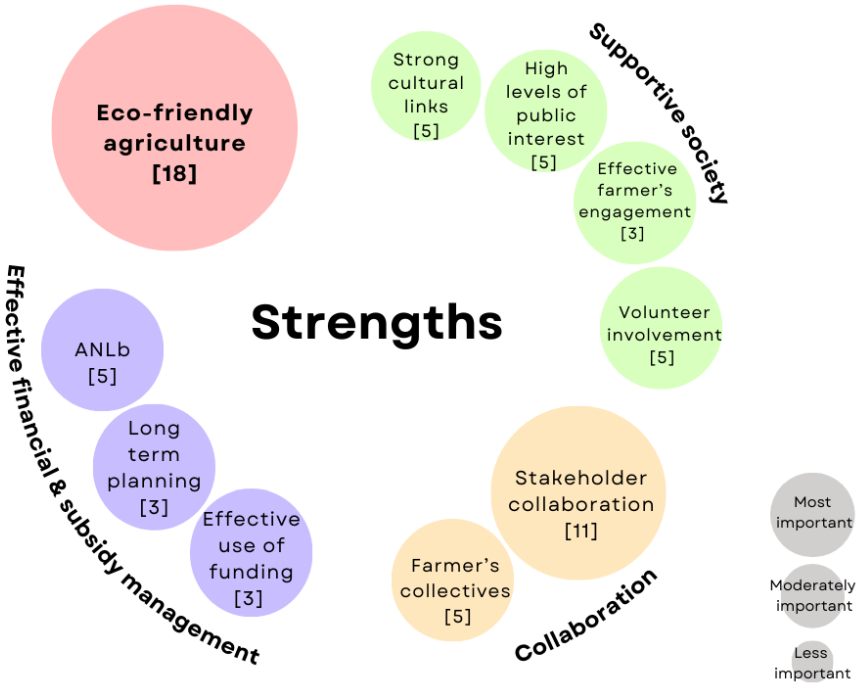

Figure 8: Themes and Subthemes for strengths. The numbers in brackets are the frequency of occurrence of each theme/sub-theme in the survey.

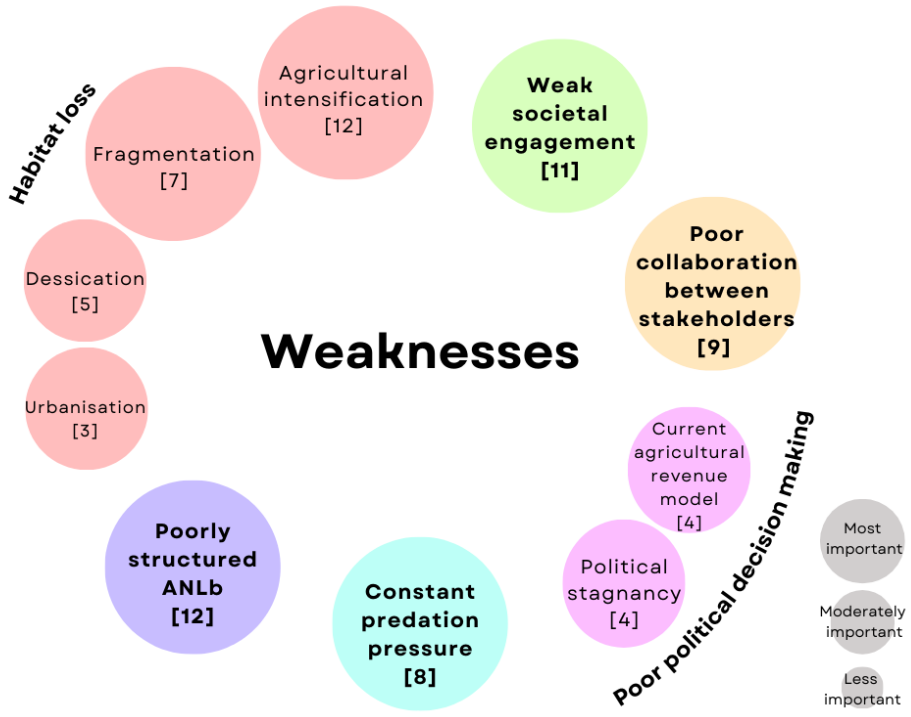

Figure 9: Themes and Subthemes for weaknesses. The numbers in brackets are the frequency of occurrence of each theme/sub-theme in the survey.

Figure 10: Themes and Subthemes for opportunities. The numbers in brackets are the frequency of occurrence of each theme/sub-theme in the survey.

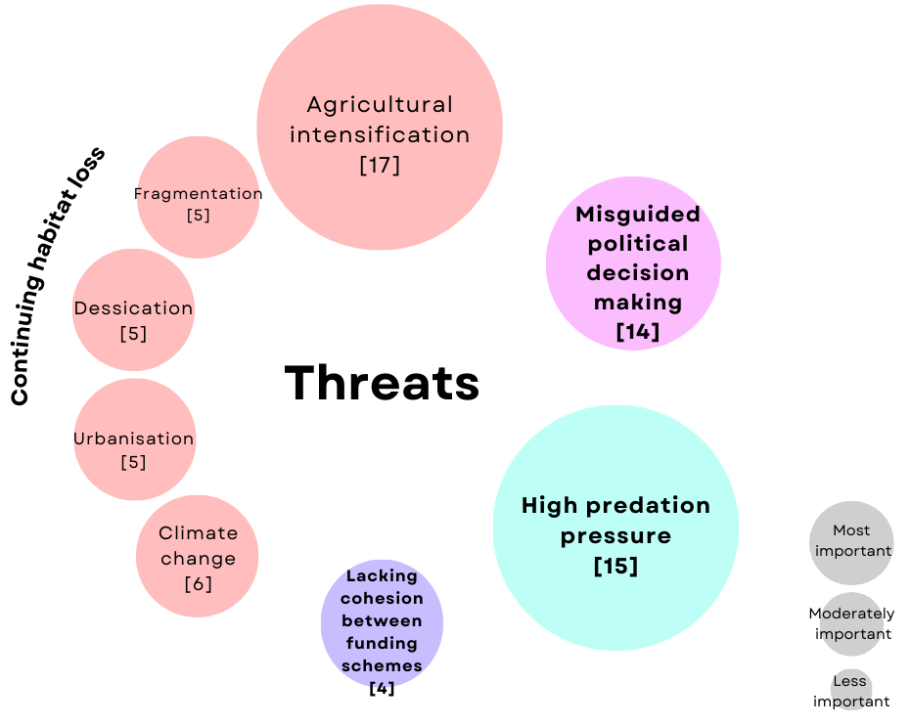

Figure 11: Themes and Subthemes for threats. The numbers in brackets are the frequency of occurrence of each theme/sub-theme in the survey.

4.1 Strengths (Most Important)

4.1.1 Supportive Society

4.1.1.1 High Public Interest

Meadow bird conservation in the Netherlands has very high interest from the public, with a significant number of members from the community actively involved in conservation initiatives. This widespread interest raises awareness about the value of nature in rural areas. As a result, meadow bird conservation is relatively high on the political agenda.

4.1.1.2 High Volunteer Involvement

Volunteers are a major strength in meadow bird conservation. The many volunteers provide many 'eyes and ears in the field', as a result of which signals of threats are quickly picked up. In addition, volunteers provide a good picture of how many birds there are during the breeding season.

4.1.1.3 Strong Cultural Links

In regions like Fryslân, meadow birds form a part of the cultural identity. The decline of meadow bird populations is felt in the heart of professional conservationists and across the wider community of the province. This cultural significance drives local support for conservation efforts.

4.1.1.4 Effective Farmer Engagement

Integrating farmers into conservation practices motivates farmers. Farmers who are involved become more aware of the ecological impacts of their agricultural practices and become more motivated to adopt more bird friendly practices. Engaged farmers can also provide valuable insights and on-the-ground observations (continuous monitoring) which can improve and refine conservation efforts.

4.1.2 Ecofriendly Agriculture

Effective water management helps to create and maintain suitable habitats for many meadow bird species. A strength in this is that the hydrology of the landscape can be very adjustable through the many ditches and footdrains; water levels can be effectively elevated. Proper grassland management is a strong point in meadow bird management. Late mowing dates and low-intensity grazing help maintain the diverse vegetation and allow meadow birds to complete their breeding cycles undisturbed. Mosaic management involves creating a patchwork of different habitat types within agricultural landscapes to support biodiversity. Such heterogeneity provides a range of nesting sites and food resources for meadow birds, enhancing their chances of survival and reproduction. Mosaic management balances agricultural productivity with ecological needs, promoting a biodiverse and resilient landscape.

4.1.3 Collaboration

4.1.3.1 Stakeholder Collaboration

Collaboration between different stakeholders including governments, conservationists, farmers, hunters, water boards, volunteers and researchers is key for effective meadow bird conservation in the Netherlands. It ensures that conservation efforts are well-rounded and inclusive. As a result, meadow bird conservation is not a top-down approach.

4.1.3.2 Farmer Collectives

Farmer collectives are named as a strength in meadow bird conservation in the Netherlands. Collectives enable farmers to collaborate on conservation efforts, share knowledge and implement the best practices. As a collective, farmers can create extensive and cohesive habitats for meadow birds, increasing the effectiveness of conservation efforts.

4.2 Strengths (Moderately Important)

4.2.1 Effective Financial and Subsidy Management

4.2.1.1 ANLb (Agrarisch Natuur- en Landschapsbeheer)

The ANLb provides financial support to farmers, which helps farmers to maintain and invest in bird-friendly practices. This support helps offset the costs of conservation measures and encourages farmers to adopt sustainable practices. By providing a stable source of funding, ANLb ensures that conservation efforts can be sustained over the long term, creating a positive impact on meadow bird populations. (However, ANLb has been mentioned as a weakness and a threat as well; see next sections.)

4.2.1.2 Effective Use of Funding

The available funds for meadow bird management are used effectively. Financial resources from the state, EU, and donations must be strategically invested in initiatives that provide the greatest ecological returns. This includes supporting innovative practices, long-term land management, and collaborative projects.

4.2.1.3 Long-Term Planning

When meadow bird management is managed from Terreinbeherende Organisaties (TBOs; land management organisations), the land is secured for the long term through state, EU, and private funding. Long-term strategies help address ongoing threats and adapt to changing environmental conditions, ensuring the resilience of conservation efforts.

4.3 Weaknesses (Most Important)

4.3.1 Habitat Loss

4.3.1.1 Agricultural Intensification

The continued intensification of agricultural practices is directly responsible for the negative trend in bird populations. Small-scale farms are being replaced by large-scale farms, which destroy the biodiversity of grassland ecosystems with their intensive practices. Monoculture cropping and livestock farming leads to monotonous landscapes where there is a limited diversity of grasses and insects to support bird diets. The overuse of pesticides and fertilisers in the intensive farming model leads to an accumulation of toxins in the soil and water, polluting bird habitat. When farmers institute earlier grass mowing practices, bird eggs and chicks are trampled and become increasingly exposed to predators in the short grass. In general, bird conservation practices are often simply 'added on' to the current agricultural system. This is not effective. For example, simply sewing grasslands with herbs does not produce ecologically stable herb-rich grasslands.

4.3.1.2 Fragmentation

There are too few extensive grasslands for bird breeding. The large grassland areas have been decimated, resulting in smaller and increasingly dispersed areas for bird breeding. When birds are forced to breed in smaller core areas, they are exposed to more predation pressure.

4.3.1.3 Desiccation

The management of water levels is too broad across large areas. The artificial maintenance of low water levels to prevent flooding and facilitate agriculture results in the desiccation of marshland soils. This endangers the original meadow bird habitat.

4.3.1.4 Increased Urbanisation

There is pressure from urban projects such as housing, solar parks, windmills, and airfields which has resulted in meadow bird habitat surface loss. The overgrowth of trees and bushes for parks near or within grasslands provides increased habitat for predators and this threatens bird populations.

4.4 Weaknesses (Moderately Important)

4.4.1 Poorly Structured ANLb

There is a lack of funds for ANLb management. Many farmers would like to participate in the schemes, but there are not enough funds to compensate more farmers. ANLb compensation to farmers is also too low and the fact that the contracts are only valid for six years creates uncertainty. At the same time, funds are inefficiently used to compensate for practices that overly accommodate farmers but whose effectiveness is not backed by scientific research. This represents a waste of financial resources and poorly functioning agricultural nature management. Furthermore, farmers are not required to engage with bird conservation since participating in ANLb is only on a voluntary basis.

4.4.2 Weak Societal Engagement

There is a lack of focus on biotope restoration which is required for effective bird conservation in society: many farmers are simply not interested in bird conservation; sustainability programs of dairy companies do not prioritise nature-inclusive dairy farming; bird conservation is just one priority among several conflicting priorities related to water (e.g., low water levels), agriculture (e.g., production maximisation), and nature (e.g., aversion to hunting). As bird populations decrease, the motivation of stakeholders to take urgent action also decreases. The average age of volunteers is increasing (i.e., volunteers are getting older) and there is a loss of knowledge among the volunteer community, as well as among professionals. Furthermore, volunteer availability during the breeding season is often low.

4.4.3 Insufficient Collaboration

Different stakeholders hold different and conflicting visions around bird conservation strategies. Networking capacity between bird conservation stakeholders is area-dependent. There are major discrepancies in networking among bird conservation stakeholders within and between provinces.

Nature managers have little time to carry out extensive responsibilities such as the management of meadow bird reserves, forests, heaths, drifting sands, floodplains and rivers, many of which are N2000 areas which are under pressure.

There are also some weaknesses in the collaboration between farmers and Terreinbeherende Organisaties (TBOs; Land management organisations). TBO's and farmers often have a bad relationship. There is a discrepancy between TBO's and farmers as TBO management can be dissociated from "on ground reality" through 'booklet management' where financial management is often non-transparent.

4.4.4 Constant Predation Pressure

Predation is a major threat to meadow bird populations. The landscape has become more favourable to predators, while support for predation management is lacking. The current legislation stands in the way of optimal predation management.

4.4.5 Poor Political Decision-Making

4.4.5.1 Political Stagnancy

There is a lack of political will to implement proper bird conservation policies. The government is bound in red tape, and is slow and reluctant to make significant changes to the agricultural system that would support bird conservation.

4.4.5.2 Current Agricultural Revenue Model

Currently, farmers are caught between the bank and the agro-industry. This political economic set-up pushes an intensive agricultural model of maximum production within a highly competitive market system. The extensification of current agricultural practices is not possible as long as there is no alternative revenue model for farmers. A large-scale transition to nature-inclusive agriculture is only possible if there is an economically viable revenue model to support this transition.

4.5 Opportunities (Most Important)

4.5.1 Improving Political Decision-Making

4.5.1.1 At EU Level

Policies and funding mechanisms implemented from the EU-level could help support large-scale conservation efforts. A European transition fund could help facilitate the transition towards more sustainable agricultural practices, benefiting meadow birds and broader environmental goals. In addition, large-scale allocation of N2000 areas would create large contiguous areas which can be optimally designed and managed.

4.5.1.2 At National Level

National-level decision-making involves setting long-term visions and providing the necessary financial and regulatory support for conservation. Coordination among the national government, provinces, water boards, and municipalities could ensure a more cohesive approach to meadow bird conservation. National policies and frameworks can guide sustainable practices and provide essential funding to facilitate conservation initiatives. Such initiatives could include enlarging reserves such as those in Arkenheem, Polder Oosterwolde and Puttenpolder.

4.5.1.3 At Local Level

Local decision-making is essential for effective conservation strategies to address local needs. Local stakeholders including volunteers, local residents and farmers, can be important in supporting and implementing measures that directly pertain to their environment. Engaging with the local community can foster support and help ensure that conservation efforts are tailored to the environment.

4.5.2 Extensification of Agriculture

Extensification of agricultural practices in the Netherlands can significantly improve meadow bird habitats. Extensification measures include reduced use of fertilisers, maintaining high water levels and creating wet meadows, reducing livestock intensive farming and promoting herb-rich grasslands. This ensures sustainable agricultural practices and boosts biodiversity.

4.5.3 Improving Financial and Subsidy Management

4.5.3.1 Improvement of Schemes

Improving conservation schemes like the ANLb, Grutto Attack Plan, NNN and LIFE IP offers significant opportunities for meadow bird conservation in the Netherlands. Integrating multiple projects allows for a more cohesive and effective approach, addressing various ecological needs. For example, the Grutto Attack Plan could incorporate a broader approach for optimal predation management. In addition, there could be more variety between the ANLb and the NNN, as they are now separately applied in separate areas they could complement each other.

4.5.3.2 Improvement of Funding

Providing funding for long-term management (up to 25 years) can help farms better use it for nature management. Higher compensation for management activities and the introduction of long-term contracts (12 years or more) make participation more attractive for farmers. Offering subsidies to offset value loss and facilitate farm conversion can also be beneficial. Additionally, implementing a national KPI system that rewards meadow bird friendly farmers for effective conservation practices can incentivize and recognize their efforts, fostering greater commitment to conservation goals.

4.5.3.3 Alternative Revenue Model

An alternative revenue model for farmers that rewards nature-inclusive agriculture could facilitate the extensification of agriculture. The revenue model currently in place for farmers is one that rewards intensive agricultural practices, so few farmers are able to transition to more nature-inclusive practices.

4.6 Opportunities (Less Important)

4.6.1 More Efficient Predation Management

Another opportunity for meadow bird conservation in the Netherlands is effective predation management. Managing key predators like foxes and stone martens reduces the predation pressure on vulnerable meadow bird species. Coordinated efforts and clear regulations can minimise predation threats, thereby supporting healthier and more stable meadow bird populations.

4.6.2 Improving Collaboration Between Stakeholders

Collaboration between different stakeholders such as farmers, volunteers, conservationists and governmental bodies can help contribute to the success of meadow bird conservation. Coordinated efforts ensure that all parties work towards common goals, using expertise and resources from different sectors. Collaboration between these stakeholders fosters a sense of shared responsibility, and it allows for the effective implementation of conservation measures across multiple sectors.

4.6.3 Maintaining Societal Involvement

Societal perception and commitment are critical for the success of meadow bird conservation. Increasing awareness about the importance of biodiversity and the ecological benefits of sustainable farming practices can foster widespread support. Engaging the public and encouraging a shift in perception towards valuing open landscapes and herb-rich grasslands as vital components of nature are essential. Sustained commitment from all societal sectors, including volunteers, residents, and farmers, can ensure the continuity and effectiveness of conservation efforts.

4.7 Threats (Most Important)

4.7.1 Continuing Habitat Loss

4.7.1.1 Agricultural Intensification

The further intensification of agriculture in order to keep up with a competitive world economy, instead of shifting towards a balanced approach to agriculture where nature is the guiding principle, represents a worrying trend. It is difficult to convince conventional farmers to extensify and implement necessary conservation practices. Due to the fact that bird breeding results are not improving as expected, there is a loss of motivation amongst the farmers that are involved in conservation practices on their plots. This might lead to a lack of support from farmers as they decide to quit the conservation practices that they are engaged in. Farmers' involvement in conservation practices on their plots is entirely voluntary.

4.7.1.2 Fragmentation

The areas for meadow bird habitat are shrinking. Meadow bird habitat is increasingly fragmented, threatening the reproduction success of meadow bird species.

4.7.1.3 Increased Urbanisation

Industrial sites, roads and housing complexes are expanding and consuming scarce land. Windmills, solar power plants and heavy traffic through and around bird reserves are a threat. These disturbances lead to loss of flyway and suitable nesting habitat. Expanding tree farming activities threatens to further degrade bird habitat. People have a lack of understanding of the need for open landscapes. Instead people insist on having trees and forests, which host predators and are a threat to bird populations in nearby grasslands.

4.7.1.4 Desiccation

Waterboards (waterschap) manage drainages with the objective to limit the effects of extreme weather and floods, without any consideration to ecosystem requirements in dry periods. This is fatal for bird populations which depend on wet grasslands for feeding and breeding.

4.7.1.5 Climate Change

The effects of climate change are increasing. Extreme weather events are more frequent and longer dry periods are causing a lack of food for meadow birds. Similarly, heavier rainfall washes eggs away and causes chicks to succumb to low temperatures. Climate change related sea level rise and the subsequent salinisation of plots is also a threat to bird habitat.

4.7.2 Increasing Predation Pressure

Predators (fox, martens, large inland gulls, birds of prey, badger, raccoon dog and golden jackal) are increasing. There is an urban aversion to hunting which puts pressure on farmers and hunters to limit hunting. If the legislation around predation management does not improve to allow for efficient and

effective hunting, bird populations will face continuous severe threats. At the same time and although predation management is necessary, intensive predatory management that banishes all predators is not the solution. There is a risk of ending up with an artificial 'museum-like' landscape conservation model for meadow birds: where high intensity management of predators is the only remaining option due to our inability to change our intensive agricultural landscapes.

4.8 Threats (Moderately Important)

4.8.1 Misguided Political Decision-Making

The lobby of agribusiness multinationals dominates provincial governments and the 2nd chamber. These government officials mainly focus on maintaining the status quo neo-liberal policies that leave nature to the market. This has disastrous impacts on biodiversity and climate. Additionally, there are shifting baselines for government administrators. They have either forgotten or will never know about the rich biodiversity levels we used to have in the countryside. Declining bird population trends indicate that we are running out of time, and we cannot afford to delay making important decisions for the conservation of meadow birds.

4.9 Threats (Less Important)

4.9.1 Lacking Cohesion Between Funding Schemes

The short-term contracts under ANLb are not sustainable and lead to the loss of participation amongst farmers. Conventional farmers using intensive agricultural practices are hard to convince about taking steps towards meadow bird conservation. See 'Weaknesses' section for further details. Within the Natuurnetwerk Nederland (NNN) organisation, the agriculture and nature management is calendar and financially driven. Heavy management practices are lacking, leading to overgrowth of vegetation within NNN areas. Furthermore, there is too little cohesion, overlap and supplementation between NNN and ANLb; they operate as if in two different worlds.

5 Discussion

The differing opinions on the role of farmers and the agricultural system in meadow bird conservation in the Netherlands reveal a complex and multifaceted issue brought up through the range of results expressed as strength, weakness, opportunity, and threat. On the one hand, farmers are seen as important partners in meadow bird conservation. Engaging farmers directly in conservation practices increases their awareness of the ecological impacts of their activities and motivates them to adopt more bird-friendly methods. As a collective, farmers also can create extensive and cohesive habitats for meadow birds, increasing the effectiveness of conservation efforts. Yet, respondents also highlight that current agricultural practices often incorporate conservation measures superficially without addressing the underlying ecological needs. Despite farmers' engagement in agri-environment schemes, the intensification of agriculture remains the biggest threat to meadow birds. Habitats are degraded by monoculture cropping and intensive livestock farming, resulting in a homogeneous landscape that lacks the biodiversity needed for meadow bird survival. The overuse of fertilisers and pesticides further degrades meadow bird habitats, accumulating toxins in the soil and waters. Early mowing dates disrupt the breeding cycles of meadow birds, resulting in higher predation risks for eggs and chicks. Therefore, the extensification of agriculture towards a nature-inclusive model of food production is mentioned as the most important opportunity for meadow bird conservation.

Some respondents argued that many farmers do not put enough effort into incorporating bird-friendly practices, but this may be because farmers face significant financial constraints: the existing agricultural revenue model rewards intensive farming practices. It is difficult to transition to extensive eco-friendly practices that require a reduction in agricultural yield while having to compete in a global economy for agricultural produce. Respondents have highlighted that neo-liberal policies that leave nature to the market have disastrous impacts on biodiversity and meadow bird conservation. This weakness represents a major political challenge that requires us to think critically about and reassess global market mechanisms, for the sake of biodiversity and farmers alike (Thorsøe et al., 2020). However, some respondents were less explicit about the need for an economic transformation away from neoliberalism and instead were critical of the more practical local, national, and EU-level political decision-making. A common criticism was about decisions being made too slowly due to lacking political will and shifting baselines about biodiversity levels in the Dutch government. In any case, there is a sense of urgency to take strong political action among many respondents due to diminishing meadow bird populations.

ANLb schemes were mentioned as strength, weakness, opportunity, and threat. This reflects the importance of this particular scheme for meadow bird conservation, as well as the diverse perspectives on the effectiveness of ANLb schemes. While ANLb provides essential support to farmers to engage in bird conservation, the scheme received several criticisms which require attention from policymakers at the national and EU level. Similarly, respondents underlined that there is a need for a more holistic approach to effective predation management, for schemes such as the ANLb and Grutto Attack Plan.

The literature confirms our results in terms of the limited amounts of funds and a lack of farmer participation due to the voluntary and short-term nature of the ANLb schemes (Ait Sidhoum et al., 2023). In literature, ANLb schemes are criticised for being inefficient as they are often implemented in unfavourable areas with low ground-water levels, low breeding-pair numbers, high predation rates, and exposure to noise pollution from nearby highways (Roodbergen & Teunissen, 2014). ANLb is action-based which means that farmers get compensated for nature-friendly actions despite their actual results. Developing a results-based payment schemes might encourage farmers to improve biodiversity in a cost-effective way (Thiermann et al., 2023). However, developing a results-based ANLb scheme has significant challenges, such as monitoring of results, which might be why it was not mentioned as an opportunity by our survey respondents.

According to our respondents, ANLb schemes enable nature-friendly practices and provide extra income to farmers while raising public awareness; on the other hand, there are no clear conservation targets put in place, and many farmers often do not participate in any extra efforts beyond the profit-driven ANLb packages. Burton and Paragahawewa (2011) have analysed the resistance to ANLb schemes in Europe, highlighting that there needs to be a cultural embrace of these schemes for them to be effective. Our results indicate that such a cultural embrace has not been successful among the majority of farmers in the Netherlands so far.

Respondents raised the issue that conservation schemes should be more comprehensive and complementary, by working collaboratively towards common goals of nature-inclusive agriculture. A study on EU policies and AES schemes gathered that overall EU policies towards farmland birds are managing to slow down the decline of these species but fail to reverse the downward population trends (Gamero et al., 2017). Therefore, Runhaar & Polman (2018) mention the importance of focusing on partnerships for collaboration to work towards the benefit of meadow birds. They give the example of the collaboration between BirdLife NL, nature conservation NGOs, and 130 farmers (Runhaar & Polman, 2018). By rewarding farmers for transitioning to nature-friendly farming practices and offering them a fair price for their products, agriculture can contribute to nature restoration and the return of grassland birds (Vogelbescherming Nederland, 2022). Long-term agreements for agricultural nature management and an increased milk price can provide farmers with security. It is essential to establish a sustainable earning model for farmers. Therefore, bird conservationists argue for including the Grutto Attack Plan in the National Rural Area Program and its associated Transition Fund to provide farmers with the

necessary security they aspire (Aanvalsplan-Grutto, 2020). Similarly, Runhaar & Polman (2018) advocate for agrobiodiversity government frameworks, different from AES arrangements, where the weight is on the partnership between farmers to motivate each other. This reflects the farmer's collective system in the Netherlands which was mentioned as a strength by several respondents in our survey. By encouraging collaboration amongst farmers and other stakeholders, more effective outcomes for meadow birds can be achieved.

Respondents highlighted the urgency of tackling high predation pressure on meadow birds. As predation pressure keeps increasing, it is important to establish efficient predation management. The legislation that is currently in place does not allow sufficient levels of hunting, due to a perceived 'urban aversion to hunting'. The literature confirms that predation management is insufficient and needs more attention (Teunissen et al., 2008). However, some respondents spoke with caution: A balanced approach to predation management is necessary where we do not simply banish all predators or end up with artificial "museum-like" conservation models. This points towards the importance of a 'nature-inclusive' approach to predation management, where habitat restoration must be prioritised in parallel with effective predation management.

Interestingly enough, climate change was not mentioned very often. When listed as a threat, the direct effects of climate change on meadow bird populations were mainly addressed: lack of food due to extreme weather events and long droughts, heavy rainfall washing away eggs and nests, chicks succumbing to lower temperatures, and the salinisation of plots resulting from sea level rise. However, the indirect effects of climate change, such as increased agricultural intensification and land use change, have been identified as the primary drivers of habitat loss and the decline of meadow bird populations in the Netherlands (Van Dijk et al., 2015). For example, optimal mowing dates have moved up by more than a month over the last century as a result of the increased pace of grass growth, resulting in the destruction of nests and lower survival rates of chicks (Jacobs et al., 2015; Kleijn et al., 2010). Another example is the deterioration of habitat quality resulting from changes in the groundwater levels due to subsidence, driven by human-managed water levels (Van Dijk et al., 2015). Even though these points are identified as weaknesses and threats throughout the survey, respondents did not directly identify them as results of climate change.

Societal involvement comes as strength as well as a weakness. For example, the involvement of volunteers is seen as a major strength in meadow bird conservation, providing 'eyes and ears in the field'. However, volunteer availability is often low during the breeding season, and because the average age of volunteers is increasing, a lot of knowledge is lost within the volunteer community. Moreover, even though meadow bird conservation has very high interest from the public in the Netherlands, meadow bird conservation is only one of many (conflicting) priorities relating to water and land management, agriculture, and nature management. In addition, since meadow birds form a part of the cultural identity of many regions in the Netherlands, the decline in meadow bird populations is felt in the heart of the whole community. However, due to the still-ongoing decline in meadow bird populations, the motivation to undertake urgent conservation efforts is decreasing among many stakeholders and volunteers. As stated earlier, involving farmers in conservation practices motivates farmers to adopt more bird-friendly practices, as well as provide valuable insights and on-the-ground observations. However, this reliance on farmer involvement is a significant weakness as well, as participating in agri-environmental schemes is voluntary and farmers are not required to engage with meadow bird conservation.

Despite all this, respondents also saw societal involvement as an opportunity. Spreading awareness of the importance of meadow bird conservation can maintain and foster support from the wider community. Continued support from societal sectors including volunteers, local residents, and farmers, can ensure the continuity and effectiveness of conservation efforts.

This HS provided valuable insight into the main drivers of meadow bird conservation in the Netherlands. The vast majority of respondents were conservation practitioners, with lesser participation

of farmers, and policymakers. A more targeted survey to include these stakeholders would enable a more holistic representation of opinions on the threats and opportunities facing meadow birds. More specifically, future research should study the psychology and political reality of farmers who do not participate in ANLb schemes and are not intrinsically motivated to implement bird-friendly changes on their farms. The results of such a study could help us understand the political steps needed to change the intensive agricultural practices of the current system which are causing meadow bird population decline.

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The project focuses on the protection of grassland birds such as Black-tailed Godwit, Lapwing and Curlew, and their habitats. The aim is to create and connect optimal breeding and non-breeding areas along the East Atlantic Flyway.

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