Meadow bird conservation in The Netherlands – lessons from the past and future developments

Maja Roodbergen & Wolf Teunissen

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Common Agricultural Policy (CAP) has led to an increased food production in Western Europe, resulting in a more intensive use of the available grasslands. At the same time the total amount of grassland decreased. As a result the numbers of meadow birds declined very rapidly. Since 1990, Black-tailed Godwit numbers dropped by 60%, Northern Lapwing by 55%, Eurasian Oystercatcher by 70% and Common Redshank by 33%. Meadow bird protection in The Netherlands consists of agri-environmental schemes (AES, mainly nest protection and postponed mowing), voluntary nest protection, and reserves, in this order of importance in terms of hectares. In 2011, the total area with conservation measures was about 375,000 ha. The total costs for AES schemes in that year were 47 million Euro. However, AES have so far proved to be ineffective in The Netherlands. Many AES are applied in unsuitable areas. In addition, nest protection is an important measure, but it has its drawbacks: predation rates may increase due to visits to nests, and chick survival is not improved by this measure. To improve the effectiveness of conservation measures a new approach is presented, 'Meadow bird landscapes'. These areas house high densities of meadow birds and have the right conditions like high water levels and openness. Without these conditions conservation measures will not stop the decline. However, future developments may hamper the effectiveness of this new approach. The targets of the new CAP reform have already been adjusted to a lower level, nature conservation will be decentralised in 2015 and in addition the milk quota will be ceased at the same year. Therefore it is questionable whether the new AES approach in The Netherlands will compensate for these future developments.

Keywords: meadow birds, conservation, CAP reform, AES schemes, The Netherlands.

1. Introduction

The Common Agricultural Policy (CAP) was launched in 1962, but has its origins in the 1950s in six West European countries, where agriculture had been damaged by years of war, leading to food shortages. The CAP aimed at improving agricultural productivity, thereby ensuring the availability of sufficient and reasonably priced food and a fair standard of living for farmers.

The CAP provided incentives to produce by giving subsidies to farmers, combined with border protection and export support. This led to major surpluses of agricultural products in the 1980s, which had to be either exported with the help of subsidies, or stored or disposed of within the EU. These measures were expensive and distorted world markets (http://ec.europa.eu/agriculture/cap-overview/2012_en.pdf). Moreover, the accompanying intensification has led to major environmental problems and biodiversity loss, and society became increasingly concerned about the environmental sustainability of agriculture. These problems have led to several major reforms of the CAP (1990, 2003, 2008 and 2013), which, however, did not lead to effective solutions so far, at least with respect to biodiversity

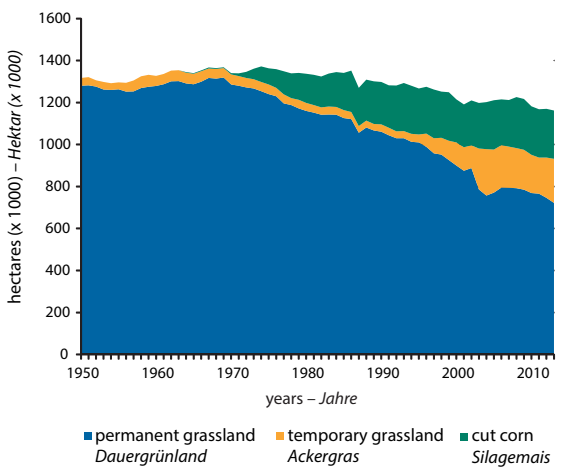

Fig. 1: Development of permanent and temporary grassland and cut corn in The Netherlands from 1950 onwards. Data: statline.cbs.nl. – *Entwicklung der Flächenanteile von Dauergrünland, Ackergras und Silagemais in den Niederlanden seit 1950.*

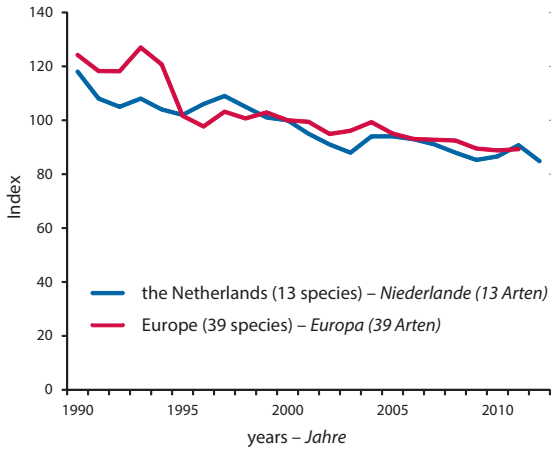

Fig. 2: Farmland bird index for Europe (39 species) and The Netherlands (13 species). The index is set to 100 in year 2000. Source: The Breeding Bird Monitoring Program (organised by SOVON in close collaboration with Statistics Netherlands and provinces and funded by the Dutch Ministry of EZ), European Bird Census Council (EBCC). –*Entwicklung der Bestandsindizes für Vögel der Agrarlandschaft in Europa (39 Arten) und der Niederlande (13 Arten). Im Jahr 2000 steht der Index bei 100.*

loss (a.o. Donald *et al.* 2002, 2006, Wretenberg *et al.* 2006).

The Netherlands was one of the six countries that initiated the CAP and is a leading country in agricultural intensification. Average yearly milk production per cow was 8,006 kg in 2012, compared to 6,636 kg in the EU27, and was only exceeded by Denmark, Sweden and Finland. For comparison: in 2000 the yearly milk production was 7,397 kg per cow. (http://www.prodzuivel.nl/pz/productschap/publicaties/zic/zicmvh2012.pdf). At the same time the proportion of farms that held more than 70 cows increased from 21.7% in 2000 to 52.3% in 2012. The total amount of grassland decreased from 1.32 million ha in 1950 to 0.93 million ha in 2013 caused by expanding cities and infrastructure, but also by an increasing amount of cut corn from 6,000 ha in 1970 to 230,000 ha in 2013. In the 1950s, only 3% of grasslands consisted of non-permanent grassland (renewed within five years), but nowadays this proportion is 23.5% (Fig. 1, statline.cbs.nl). In three decades time, the mowing frequency increased by one extra cut per season (statline.cbs.nl) and the median first mowing date advanced by two weeks (from 25th May in 1982 to 11th May in 2005, Kleijn *et al.* 2010). This intensification of agriculture has led to a rapid decline of biodiversity in the Dutch countryside, similar to the whole of western Europe (Fig. 2). As agriculture encompasses c. 60% of the land surface within The Netherlands, this has had a major impact on the Dutch biodiversity in general.

An important group of species for which The Netherlands has a large responsibility are meadow-breeding waders. Over 40% of European Black-tailed Godwits *Limosa limosa*, 25% of Eurasian Oystercatchers *Haematopus ostralegus* (Oystercatchers hereafter) and 10% of Northern Lapwings *Vanellus vanellus* (Lapwings hereafter) breed in The Netherlands. Meadow bird populations have declined strongly in The Netherlands since the 1960s. In the period 1990–2012, for which good monitoring data are available and declines are most pronounced, Black-tailed Godwit numbers dropped by c. 60%, Lapwing by 55%, Oystercatcher by 70% and Common Redshank *Tringa totanus* (Redshank hereafter) by 33% (Fig. 3, SOVON).

Causes for these declines are the abovementioned intensification of agriculture, leading to low ground water levels, frequent, early and synchronised mowing, and monotonous and dense swards with low insect availability, aggravated by high predation rates and climate change. These factors affect reproductive output and especially chick survival of meadow birds (Schekkerman 2008, Kleijn *et al.* 2010, Roodbergen *et al.* 2012).

2. Meadow bird conservation

The first meadow bird reserves in The Netherlands were already established in 1909 (Waal en Burg on the Wadden Sea island Texel), while the first agri-environmental schemes (AES) aimed at meadow birds started in 1975. At present, conservation efforts for meadow birds consist of reserves (6.8% of protected area, Table 1), nest protec-

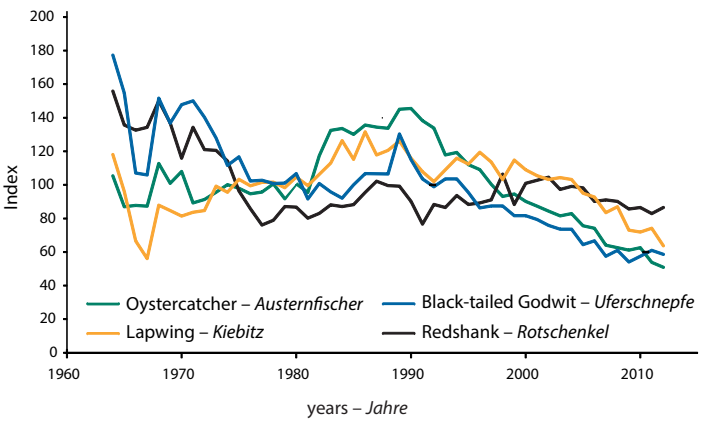

Fig. 3: Trends of Black-tailed Godwit, Lapwing, Oystercatcher and Redshank in The Netherlands. Trends are based on territory mapping. To improve comparisons between species the mean index value for each species is set to 100. *– Bestandsentwicklung von Uferschnepfe, Kiebitz, Austernfischer und Rotschenkel in den Niederlanden. Der Bestandsindex wurde auf der Basis von Revierkartierungen errechnet. Zur besseren Vergleichbarkeit wurde der durchschnittliche Indexwert für jede Art auf 100 gesetzt.*

Table 1: Conservation measures for meadow birds in The Netherlands in 2011 (Teunissen & van Paassen 2013). Costs for management are based on a combination of surface area and subsidies for the different types of management. – *Naturschutzmaßnahmen für Wiesenvögel in den Niederlanden 2011 (Teunissen & van Paassen 2013). Managementkosten (letzte Spalte) verbinden flächenbezogene (surface area) und leistungsbezogene (Gelegeschutz, Verschiebung der Mahdzeitpunkte und andere) Entschädigungen.*

Measure – *Maßnahme*	**Primary land use – *primäre Landnutzung***	**Surface area (% of protected area) – *Fläche (% geschützt)***	**Costs for management – *Kosten der Maßnahmen***
Reserves – *Schutzgebiete*	Nature – *Natur*	25,492 ha (6.8%)	12,271,180 €
AES nest protection – *Agrarumweltmaßnahmen: Nestschutz*	Agriculture – *Landwirtschaft*	160,529 ha (42.8%)	11,888,782 €
AES postponed mowing (until 23rd May or 1st, 8th, 15th or 22nd June) – *Agrarumweltmaßnahmen: Verschiebung der ersten Mahd (bis 23. Mai oder 1., 8., 15., 22. Juni)*	Agriculture – *Landwirtschaft*	20,849 ha (5.6%)	9,010,814 €
AES other – *Agrarumweltmaßnahmen: sonstige*	Agriculture – *Landwirtschaft*	14,415 ha (3.8%)	13,572,097 €
Voluntary nest protection – *ehrenamtlicher Nestschutz*	Agriculture – *Landwirtschaft*	154,014 ha (41%)	645,000 €
Total – *Summe*		375,299 ha	47,387,873 €

tion, both under AES schemes (42.8%) and voluntary (41.0%), and other AES schemes (9.4%), such as postponed mowing (5.6%) and creating wet areas for roosting or herb-rich grasslands (Teunissen & van Paassen 2013). Nest protection is thus by far the most widely used conservation measure, encompassing over 80% of the protected area. In 2012, around 9,000 volunteers searched for nests to protect them and collectively found over 83,000 nests, of which c. 76,000 belonged to the four meadow-breeding waders (Table 2, Teunissen & van Paassen 2013). Nearly 75% of the money spent yearly on meadow bird conservation goes to AES schemes (34.5 million Euro), the remaining 25% goes to management measures in reserves (12.3 million Euro, Table 1).

Table 2: Numbers of nests found and protected by volunteers in 2012, both under AES and voluntary (Teunissen & van Paassen 2013). – *Anzahl von Ehrenamtlichen gefundener und geschützter Gelege im Jahr 2012 (Teunissen & van Paassen 2013).*

Species – *Art*	**Nests found in 2012 – *2012 gefundene Nester***
Lapwing – *Kiebitz*	45,173
Black-tailed Godwit – *Uferschnepfe*	12,523
Oystercatcher – A*usternfischer*	12,758
Redshank – Rot*schenkel*	5,696
Other – *sonstige*	7,541
Total – *Summe*	**83,691**

3. AES schemes

Meadow bird conservation therefore heavily depends on AES schemes and nest protection. This has several advantages: the measures can be carried out in relatively large areas, farmers receive extra income from and are actively involved in nature conservation, public awareness is increased, because a large group of volunteers is involved, and AES schemes often improve the aesthetics of the agricultural landscape. However, no clear targets have been set and finally and most importantly, effectiveness is low as shown by the rapid decline of meadow birds.

Though over 47 million Euros is spent on meadow bird conservation, populations continue to decline at a steady pace. The decline seems steeper in regular fields and fields with AES schemes than in reserves (van Egmond & de Koeijer 2006). Kleijn *et al.* (2001) showed already in 2001 that AES schemes for meadow birds are ineffective in The Netherlands. Breeuwer *et al.* (2009) even found that AES schemes with postponed mowing lead to more negative population trends of Lapwing and Redshank after the start of the contract than before compared to fields without contracts, while trends of Black-tailed Godwits and Oystercatchers remained unchanged.

4. Low effectiveness

There are probably several reasons for this low effectiveness of AES schemes and nest protection. First of all, 43% of the AES schemes are situated in unfavourable areas, with low breeding pair densities, low ground water levels, high predation rates, near to major roads and trees (Melman *et al.* 2008). Moreover, visiting nests for nest

protection may cause extra losses up to even 15% per visit in areas with high predation rates (Goedhart *et al.* 2010) and is therefore only beneficial when nests would otherwise be lost owing to agricultural activities. Until recently, however, volunteers tended to search agricultural fields for nests regardless of upcoming agricultural activities, and to visit nests regularly in order to determine their outcome, stimulated by the organisations coordinating these activities. Nowadays they are instructed otherwise. They are searching for potential breeding birds and only trying to locate a nest if a farmer is planning to use the field for cattle grazing or mowing.

Postponing mowing until nests have hatched should therefore be more effective, as nests do not have to be protected and therefore disturbed. Indeed, delaying mowing seems to increase nest success (Schekkerman *et al.* 2008), but after hatching, chick condition and survival are low in intensive fields. Increasing nest success by protecting nests and/or delaying mowing may even act as an ecological trap if not accompanied by measures increasing chick survival (Kentie *et al.* 2013). Chicks hatching from nests on intensive fields are confronted with either recently mown fields offering no insects or cover, or with dense, monotonous swards in which foraging is difficult (Kentie *et al.* 2013, Kleijn *et al.* 2010). High nest success rates may increase breeding site fidelity and thus retain birds in an area, even when reproductive output is low due to insufficient chick survival. The same goes for measures in which fields are inundated to create roosting sites and thus attract birds.

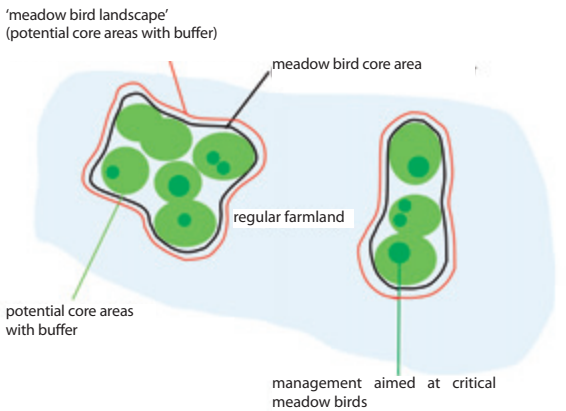

Fig. 4: Schematic overview of the concept . These landscapes consist of core areas with a minimum density of breeding pairs of certain species or group of species. Core areas within 2 km of each other are combined in potential core areas and together with a buffer of 600 m around them they form a 'meadow bird landscape'. Within the core areas more intensive measurements can be taken to preserve critical meadow birds like Ruff *Philomachus pugnax*. Usually these areas are reserves. – *Schematische Darstellung des Konzepts „Wiesenvogel-Landschaft" Diese Landschaften bestehen aus Kerngebieten mit einer definierten Mindest-Brutpaardichte bestimmter Arten bzw. Artengruppen: Aggregierte Kerngebiete mit weniger als 2 km Entfernung zueinander werden als „Potenzielle Kernflächen" zusammengefasst. Wiesenvogel-Landschaften ergeben sich unter Ergänzung eines Puffergürtels von 600 m Breite um das Kerngebiet. Innerhalb der Kerngebiete können weitergehende Maßnahmen für stark bedrohte Arten, wie z. B. den Kampfläufer, umgesetzt werden. Diese Wiesenvogel-Kerngebiete sind normalerweise Schutzgebiete.*

5. Necessary improvements

To increase effectiveness of AES schemes and nest protection, several aspects should be addressed. When protecting nests, only fields with upcoming agricultural activities (mowing, grazing, application of fertilizers etc.) should be searched for nests and nests should be visited as little as possible. Nest protection and postponed mowing should only be carried out in areas with sufficient chick foraging habitat, which can be created by more extensive management of fields (low fertilizer input, high ground water levels) and by removing tall features such as trees or bushes in the surroundings. To attract birds to these productive areas, ground water levels should be elevated and wet areas should be created for roosting (Kleijn *et al.* 2008). Finally, conservation measures should be concentrated in areas with high densities of meadow birds with favourable conditions (ditch water levels less than 50 cm under surface level, unobstructed visibility

Fig. 5: Potential core areas for the Black-tailed Godwit in The Netherlands, with a density >30 breeding pairs (red) or >15 breeding pairs (blue) per 100 ha; taken from Melman *et al.* (2012). – *Potenzielle Kerngebiete für die Uferschnepfe in den Niederlanden. Dichten mit > 30 Revierpaaren je 100 ha sind rot bzw. bei >15 je 100 ha blau eingezeichnet (aus* Melman et al. *2012).*

at least 500 m, mowing dates later than 31st May; Teunissen *et al.* 2012, Melman *et al.* 2012). The concept for this approach is schematically explained in Fig. 4. Within the agricultural area we distinguish core areas with a minimum number of breeding pairs of a group of farmland birds or specific species. Core areas that are spatially related to each other (less than 2 km apart) are combined in meadow bird landscapes with a buffer of at least 600 m around them to guarantee the openness of this landscape. Within these areas conditions like ground water levels and openness should be optimized. Potential core areas for Black-tailed Godwit in The Netherlands consist of more than 250,000 ha in total (Fig. 5). At the moment only a few (parts) of these areas have the right conditions. Rising ground water levels or increasing openness are still not included in AES, although they are the most important conditions for maintaining meadow bird populations at the present level.

6. Future developments

In 2012, the Dutch government decided to delegate its tasks concerning nature conservation and management to the provinces. Currently, the transition is in full progress. However, the division of responsibilities is often not clear and many provinces differ in their view on nature management. How well provinces will take up their new responsibilities remains to be seen, but it seems unlikely that nature conservation will become more efficient being spread out over 12 provinces.

A (hopefully) positive development may be that, starting in 2016, AES can only be taken up by a collective of farmers who need to design a management plan for their area. At the moment, provinces are determining in which areas these schemes can be taken up. The coordination of management efforts within larger areas may increase effectiveness of AES in The Netherlands, if carried out correctly.

Although the new CAP reform of 2013 aimed to increase the nature value of farmland and to halt biodiversity declines, the initially ambitious targets have been adjusted in the decision making process, even to a level that biodiversity gains seem unlikely, especially for grasslands (Pe'er *et al.* 2014). The reformed CAP still allows a reduction in the area of permanent grasslands of up to 5% and does not pose any criteria for management or quality, thus enabling further deterioration of grasslands.

In addition, milk quota will be ceased in 2015, which will enable European dairy production to increase even further. This will most likely happen in the countries which already produce at their allowed maximum, such as The Netherlands (http://www.prodzuivel.nl/pz/productschap/publicaties/zic/zicmvh2012.pdf). In recent years, governments have already been raising the quota at a faster pace than asked for by their internal market, allowing dairy farmers to prepare for a quota-free future. New AES will have to compensate for these future developments and therefore need ambitious targets and measures. It remains to be seen whether they can.

7. Zusammenfassung

Roodbergen, M. & W. Teunissen 2014: Wiesenvogelschutz in den Niederlanden – Erfahrungen und zukünftige Entwicklung. Vogelwelt 135: 29–34.

Die Gemeinsame Agrarpolitik der EU (GAP) führte zu einer Zunahme der Nahrungsmittelproduktion in Westeuropa und resultiert in einer intensiveren Nutzung des Grünlands. Dessen Fläche nahm gleichzeitig ab. Die Bestandszahlen von Wiesenvögeln gingen seit 1990 mit 33 % bis 70 % dramatisch zurück. Die Niederlande haben eine große Verantwortung für den Schutz von Wiesenvögeln, da ihre Anteile am europäischen Brutbestand mit gut 40 % (Uferschnepfe), 25 % (Austernfischer) bzw. 10 % (Kiebitz) hoch sind. Die Wiesenvogelbestände haben im Vergleich zu den 1960er Jahren stark abgenommen. Allein in der Zeit von 1990 bis 2013 gingen die Bestände bei der Uferschnepfe um 60 %, beim Kiebitz um 55 %, beim Austernfischer um 70 % und beim Rotschenkel um 33 % zurück. Ursache ist die zunehmende Intensivierung der landwirtschaftlichen Nutzung, die zu niedrigen Grundwasserständen führt, häufige und frühe sowie synchronisierte Mahd zur Folge hat und eintönige und dichte Grasbestände mit geringem Angebot an Wirbellosen erzeugt. Dazu kommen weitere negative Einflüsse durch hohe Prädationsraten an Gelegen und Küken sowie klimatische Veränderungen. Diese Faktoren wirken sich insbesondere negativ auf die Reproduktionsraten und hierbei besonders auf die Überlebensraten von Jungvögeln aus.

Wiesenvogelschutz begann in den Niederlanden bereits um 1975. 2011 umfasste die Gesamtfläche mit Schutzmaßnahmen rund 375.000 ha, wobei nahezu 85 % auf Nestschutzmaßnahmen entfielen. Die Gesamtkosten für diese Agrarumweltmaßnahmen (agri-environmental schemes, AES) beliefen sich im Jahr 2011 auf 47 Millionen Euro. Trotz dieses hohen Aufwands ist der Erfolg gering. Die Bestände der Wiesenvögel nehmen weiterhin rasant ab. Offensichtlich sind die Maßnahmen nicht effektiv oder werden nicht in dafür geeigneten Gebieten angewandt. Um die Effektivität von Naturschutzmaßnahmen für Wiesenvögel zu verbessern, wird ein neuer Ansatz vorgestellt: „Wiesenvogel-Landschaften" (meadow bird landscapes). In diesen Regionen sind noch hohe Dichten von brütenden Wiesenvögeln vorhanden, und die Grundvoraussetzungen wie hohe Wasserstände unter Flur und offene Landschaft sind gegeben. Ohne diese Voraussetzungen können Schutzmaßnahmen den Rückgang nicht wirksam stoppen.

Vorschläge zur Verbesserung der Erfolgsaussichten von Naturschutzprogrammen und Maßnahmen werden vorgestellt: 1) Gelegeschutz sollte nur durchgeführt werden, wenn Maßnahmen auf der Fläche anstehen. 2) Gelege sollten so selten wie möglich aufgesucht werden. 3) Gelegeschutz und Mahdverschiebungen sind nur dort sinnvoll, wo ausrei-

chend Nahrungsflächen für Küken zur Verfügung stehen, mit 4) extensiv bewirtschafteten Flächen (kombiniert mit geringem Düngemitteleinsatz, hohen Grundwasserständen, Nähe zu entsprechend entwickelten Schutzgebieten) und 5) Beseitigung aller hohen Vertikalstrukturen wie Bäumen und Büschen in der Umgebung. Um die Attraktivität für Wiesenvögel zu erhöhen, sollten Wasserstände auf weniger als 50 cm unter Flur erhöht, gehölzfreie Offenheit der Landschaft im Umkreis von wenigstens 500 m hergestellt und der Zeitpunkt der ersten Mahd in den Juni verschoben werden. – Allerdings bedrohen zukünftige Entwicklungen den Erfolg dieses Ansatzes. Die Ziele der GAP-Reform sind bereits angepasst und auf den Wegfall der Milchquote 2015 eingestellt. Insofern steht in Frage, ob der neue Ansatz für Naturschutzprogramme in den Niederlanden die zukünftigen Entwicklungen in der Landwirtschaft kompensieren kann.

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Maja Roodbergen, SOVON Dutch Centre for Field Ornithology, P. O. Box 6521, NL-6503 GA Nijmegen, Niederlande und Centre for Avian Population Studies, P. O. Box 50, NL-6700 AB Wageningen, Niederlande; E-Mail: m.roodbergen@nioo.knaw.nl

Wolf Teunissen (korrespond. Autor), SOVON Dutch Centre for Field Ornithology, P. O. Box 6521, NL-6503 GA Nijmegen, Niederlande; E-Mail: wolf.teunissen@sovon.nl