

Trilateral Goose Management Scheme



Goose Management Group

Wadden Sea Forum

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Report Trilateral Goose Management Scheme

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1. Introduction

A substantial part of the Wadden Sea Region is one of Europe's outstanding wetland areas and is with about 10 million waterbirds passing through one of the world's most important wetlands for migratory birds and is additionally a very important breeding area for many species of coastal and meadow birds. This is also underlined by the implementation of the EU habitat and bird directives and Natura 2000.

The mainland part of the Wadden Sea Region as well as the islands are characterized by fertile marshes which have an important function as a feeding and resting area for migratory birds and a breeding area for meadow birds. These areas are also known for its considerable agricultural production, which produces a large volume of common and high value crops, grass, cabbage and potatoes.

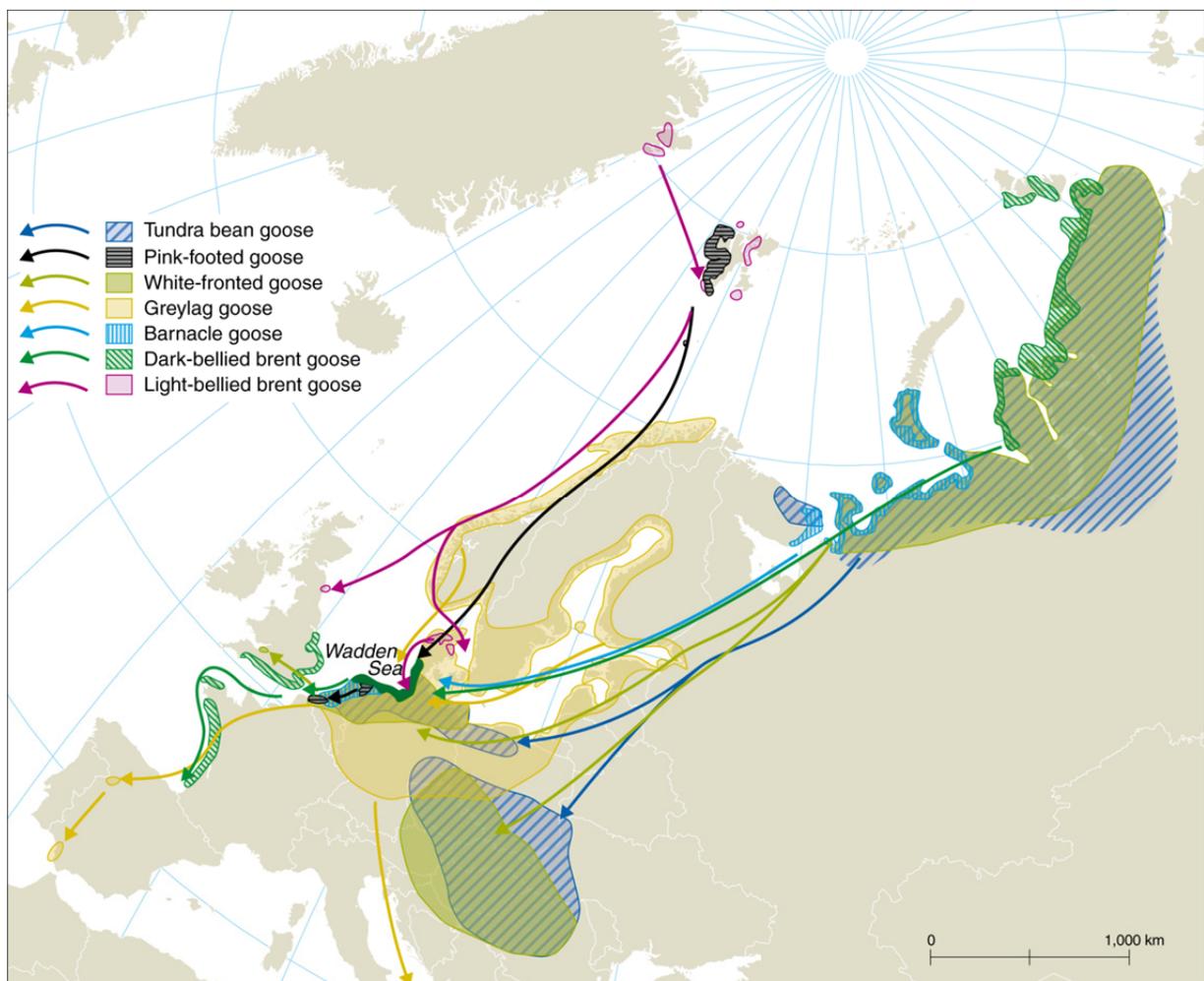


Figure 1.1 Breeding and wintering areas and migratory routes of the 7 goose populations that frequent the Wadden Sea Region.

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The agricultural and tourism sectors are crucial for the economic wellbeing of the communities along the Wadden Sea coast and in many areas agriculture employs up to 20% of the local workforce. Agriculture can also function as a key element in the preservation of cultural heritage and in nature conservation management. However, during recent decades, conflicts between geese and agricultural interests have increased. So far, mitigation measures have been sought at a local or regional level only, with a risk that conflicts are transferred across the national borders (e.g. when active scaring of geese is practised like in The Netherlands). Hence, there is a growing need for a trilateral framework to design and implement management measures for geese. So far, few of such international approaches to mitigate conflicts have been carried out, e.g. the recent AEWA International Species Management Plan for the Svalbard Pink-footed Goose (Madsen & Williams 2012).

1.1 Background

The proper management of geese is an issue of increasing relevance in the Wadden Sea Region mainly due to increasing numbers of geese and improved agricultural crops favored by geese. On the one hand geese are a natural part of the Wadden Sea and the Wadden Sea Region, and are a typical element of the biodiversity for which the Wadden Sea states have an international responsibility. They also constitute an important touristic attraction (e.g. "Ringelganstage" in Schleswig-Holstein, "Zugvogeltage" in Lower Saxony).



On the other hand, some goose species cause increasing damage to farmlands, while current management schemes for geese are highly variable between countries and liable to further improvement and harmonization without ignoring the specific local situations. While some management schemes are successful like the "Hallig-Program" in Schleswig-Holstein, others are not accepted by the farming community, and/or are inefficient or not fully implemented.



Crop damage by geese may have different causes. In this case Greater White-fronted Geese were attracted by harvest remains of sugar beet, which were immediately afterwards sown with winter cereals, without ploughing. In such circumstances, damage to winter cereals would probably be reduced, when no harvest were available on the field anymore.

To avoid further conflicts, the most feasible solution is an internationally coordinated and integrated management based on a spatial setup, where the management is differentiated according to the priority of areas. Such an approach must rest upon the identification of areas defined from political, ecological and agricultural criteria, to form the basis on the designation of a network of accommodation areas along goose migratory routes and in the Wadden Sea Region.

A Goose Management Group set up under the Wadden Sea Forum (WSF) with the participation of representatives of national and regional authorities and relevant stakeholders elaborated a report on Goose Management for the Wadden Sea Region, delivered to the 11th Wadden Sea Conference (TGC) in 2010. This report contained a comprehensive analysis of the development of relevant goose populations and the national management schemes in place. Furthermore, the report presented an extensive catalogue of management recommendations and guidance for a Wadden Sea Region wide management.

The Sylt Declaration welcomed specifically the WSF goose management guidance and the ministers declared their willingness to support the development of a Goose Management Plan in cooperation with relevant authorities, to achieve a balanced management to accommodate geese in the Wadden Sea Region.

From the WSF report, delivered to the 2010 Wadden Sea Conference, it became clear, however, that the elaboration of a concrete Goose Management Plan is a huge challenge and may not be possible at the level of detail required for a management plan. Therefore, it became more realistic to elaborate a plan, which is a framework scheme on strategic level, similar to the 2010 report, but with integration of more concrete management measures and defined responsibilities.



1.2 Management follow-up

In the beginning of 2012, the WSF initiated an exploratory meeting to discuss the feasibility of elaborating a draft strategic goose management scheme. It was agreed to re-establish a Goose Management Group with representatives of farmer organizations, regional authorities, scientists and NGO's. The new GMG resumed its work in April 2012 with the intention to elaborate a strategic goose management framework scheme to be forwarded for decision to the 12th TGC. The Goose Management Group acts under the responsibility of the Wadden Sea Forum (WSF).

1.3 Tasks of the Management Group

In a constitutional meeting, the Goose Management Group agreed on the following tasks:

1. To develop a goose management framework scheme to accommodate geese in the Wadden Sea Region, based upon the results of the 2010 GMG-report and in particular the following premises
 - a. the positive use of the existing national and international regulations, in particular the framework regulations of the EU;
 - b. the recognition of geese as a valued and natural asset of the Wadden Sea Region and the international obligation to accommodate the populations;
 - c. the elaboration of an inventory of the goose populations in the Wadden Sea Region, the damage caused by the geese and the existing compensation schemes;
 - d. the delivery of concrete proposals and advice for the designation of go-areas and no-go areas in a trilateral framework, taking into account management schemes to be integrated in agricultural production;
 - e. the development of a concrete action plan, including responsibilities, to be adopted and implemented in cooperation with the national governments;
 - f. the aim of initiating a further management project with applied examples to be co-financed by EU-programs;
 - g. the relevance of a framework to be considered and applied in a wider integrated coastal management framework.
2. The results shall be compiled in a report to be submitted to the WSF in autumn 2013 and finally be forwarded for decision to the 12th TGC in February 2014.
3. To provide a platform for knowledge and information exchange.

1.4 The Wadden Sea Region as concerned management area

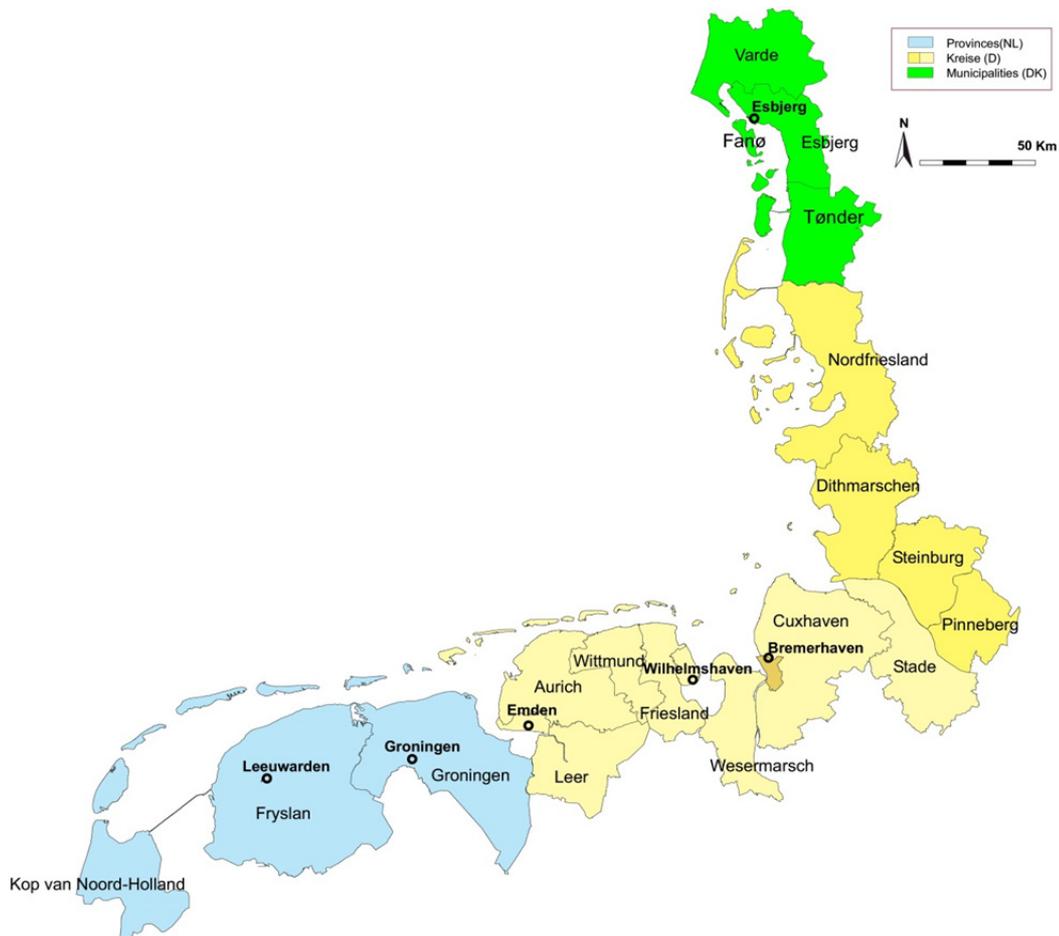


Figure 1.2: The Wadden Sea Forum management area

In figure 1.2 the political entities responsible for goose management are displayed. The focus area of the recommended management schemes concentrates on smaller parts on municipality level along the coast. For The Netherlands, for instance, where provinces also cover areas and goose populations that have no direct link with the Wadden Sea the focus is laid on the coastal municipalities directly behind the sea dike. This implies for instance that species like Pink-footed Goose are not covered in this report, as it has no direct link with the Wadden Sea.

1.5 Focus species for management

On the basis of the regional management issues and environmental schemes (see chapter 2), the GMG agreed to focus on the following migratory species to be dealt with in trilateral management issues:

- Barnacle Goose
- Dark-bellied Brent Goose
- Greylag Goose
- White-fronted Goose

Within the Wadden Sea area, local differences may exist to what extent species are considered to cause conflicts with agriculture. Barnacle Goose is mentioned in most countries to cause conflicts, followed by Greylag Goose and Dark-bellied Brent Goose. The number of species causing conflicts in the Wadden Sea area varies from one in Denmark to four in Lower Saxony and The Netherlands (chapter 2). This also expresses the general occurrence of geese in the Wadden Sea, with longest stays and highest numbers in the milder western part of the Wadden Sea Region.

It was decided not to deal with breeding geese, and non-breeding populations that occur in summertime. Although these birds do cause conflicts, management issues to avoid agricultural damage are very local and will not benefit from a trilateral approach. Most of the breeding populations (and attached non-breeders) are very faithful to their breeding sites and not likely to disperse across borders when national management schemes are endorsed.



2. Overview goose populations and trends

2.1 Flyway populations

Dealing with migratory goose populations, population developments in the Wadden Sea have to be viewed in a global context. Both in Europe and in North-America, many migratory goose populations have shown strong increases in the past decades, mainly caused by improved feeding conditions in agricultural habitats and improved protection measures (Madsen et al. 1999, van Eerden et al. 2005, Fox et al. 2005, Abraham et al. 2005, Fox et al. 2010). The four species dealt with in this report are no exception and have all increased on a longer term (Table 1).

However, on a short term, species show mixed fortunes. Greylag Goose and Barnacle Goose have continued their increases whereas the growth in the population of White-fronted Goose has levelled off, or even changed to a decline in Dark-bellied Brent Goose. In these two species, the stabilisation of population trends coincided with a lower breeding success. Greylag Goose in The Netherlands also show lower breeding success at a local scale (indicating saturated population – data Sovon Vogelonderzoek Nederland), but as the species continues to expand its breeding area, there are still many (new or recently established) sites that produce a large number of young. Based on more recent count data from The Netherlands, it becomes clear that both Greylag Goose and Barnacle Goose have continued to increase their populations after the assessment from Fox et al. in 2010, whereas numbers of White-fronted Goose remained on a stable level (Hornman et al. 2013). The flyway population of Dark-bellied Brent Goose is considered stable as well (Ebbinge et al. 2013). Data from breeding bird censuses in The Netherlands point at a local decline in breeding numbers of Barnacle Goose (Boele et al. 2013), caused by increased mortality of adult birds by culling in the breeding period (van der Jeugd 2012). However, it is not likely that this will affect the flyway population as a whole, as only a small minority of the flyway population breeds in The Netherlands

2.2 Overview of goose populations in the Wadden Sea

Of the four goose species dealt with in this report, Barnacle Goose and Dark-bellied Brent Goose are monitored with counts in the framework of the trilateral monitoring programme of TMAP. These include frequent counts during high tide, covering both the salt marshes, adjacent polder areas and coastal wetlands behind the seawall (Laursen et al. 2010). These counts will give representative data for the Wadden Sea Forum area, even if not the whole area shown in figure 1 is covered by the TMAP census scheme. For White-fronted Goose and Greylag Goose such trilateral counts are not available. Both species are covered by national censuses, but their results were not readily accessible for this report.

Table 1: Overview of goose population and a summary of population developments (after Fox et al. 2010)

	White-fronted Goose (Russia)	Greylag Goose (NW-Europe)	Barnacle Goose (Russia, Baltic, North Sea)	Dark-bellied Brent Goose (W-Siberia)
Population size	1,200,000	610,000	770,000	245,900
Long term trend	+ 7,7% since 1958	+ 8,5% since 1980	+ 7,8% since 1960	+ 6,1% since 1956
Short term trend	+ 2,9% since 1995	+ 9,1% since 1995	+ 7,8% since 1995	- 1,4% since 1991
Trend in breeding success	decline	no information	stable	stable / decline

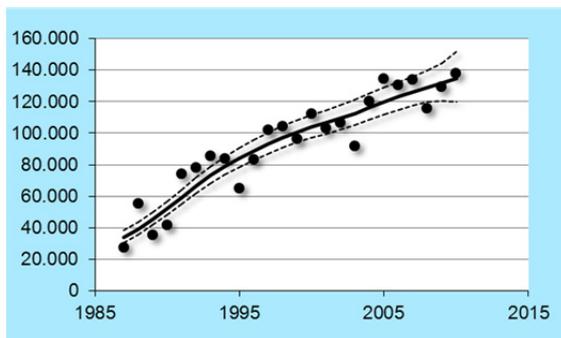
Shown is the size of the flyway population (by winter 2007/08), long term and short term trends in size of the flyway population (given as average annual change in %) and trends in breeding success (i.e. the number of young geese counted in winter).

Barnacle Goose

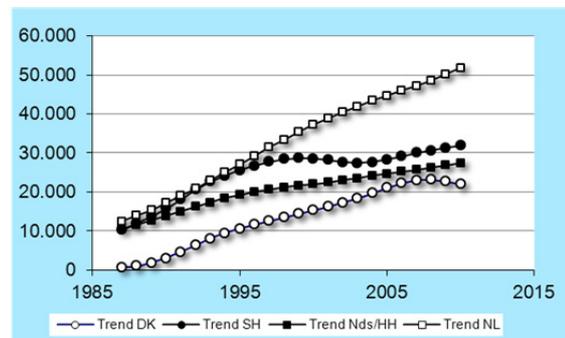


In line with the growth of total flyway populations (see chapter 2.1), Barnacle Goose have expanded their use of the Wadden Sea (Fig. 1). This is not only the result of higher numbers, but also caused by a delay in departure in spring, i.e. numbers remain on high levels during a much longer period than in previous decades. Today, they leave the Wadden Sea by the 15-20th of May, more than six weeks later than in the 1980s (Koffijberg & Günther 2005). This delay is part of a changed migration strategy during spring, caused by the strong population increase and stop-over sites in the Baltic reaching their capacity (Eichhörn et al. 2006).

When looking at recent data, numbers of Barnacle geese tend to fluctuate (Denmark, Lower Saxony) or stabilise (Schleswig-Holstein), with continuing increases only in The Netherlands. This pattern will be partly influenced by a recent series of cold winters, when many Barnacle geese will move to The Netherlands and areas in the northern part of the Wadden Sea become deserted. Moreover, the growing numbers of Barnacle geese have also lead to an expansion of their feeding areas, which are increasingly situated outside the coastal areas directly connected to the Wadden Sea, e.g. in the interior parts of The Netherlands (Koffijberg & Günther 2005, Hornman et al. 2013), Schleswig-Holstein (Kieckbusch 2012) and in western Jutland in Denmark (J. Madsen & S. Pihl/Aarhus University). Also in Lower-Saxony, feeding Barnacle geese are increasingly found inland (e.g. Kruckenberg & Kowallik 2008), although still mostly within the area covered by the trilateral Wadden Sea counting scheme. This expansion in feeding areas probably causes an underestimation of the trends presented here.



Wadden Sea (all countries combined)



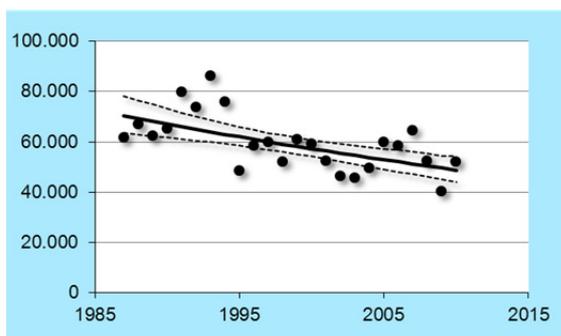
Single Wadden Sea countries (DK Denmark, SH Schleswig-Holstein, Nds/HH Lower Saxony/Hamburg, NL The Netherlands)

Figure 2.1: Trend in Barnacle Goose in The Wadden Sea, derived from TMAP census data (Blew et al. 2013). Shown is the trend for the entire Wadden Sea (with trend line and 95% confidence interval) and trend for the four single Wadden Sea countries (only trend line). Trends cover year-round presence, i.e. the trends combine both numbers and the period that geese stay in the Wadden Sea. Numbers at the vertical axis refer to average number for the entire season from July to June.

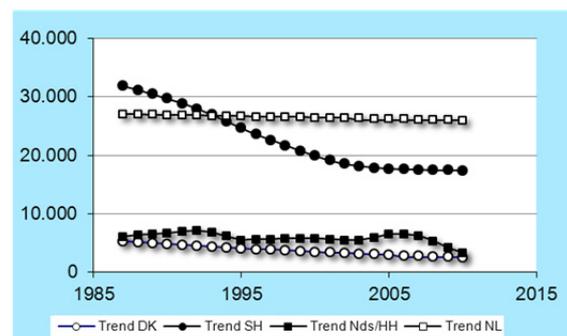
Dark-bellied Brent Goose



The long-term recovery of the flyway population of Dark-bellied Brent Goose ceased in the mid-1990s (Ebbinge et al. 2013), and was followed by a decline that is also expressed well by the Wadden Sea counts since 1987. Apart from The Netherlands (stable), numbers in all Wadden Sea countries have gone down since then (Figure 2.2). More recently, numbers in Schleswig-Holstein have stabilised at a lower level. Overall, numbers in this species show pronounced fluctuations from year, caused by fluctuations in breeding success.



Wadden Sea (all countries combined)



Single Wadden Sea countries (DK Denmark, SH Schleswig-Holstein, Nds/HH Lower Saxony/Hamburg, NL The Netherlands)

Figure 2.2: Trend in Dark-bellied Brent Goose in The Wadden Sea, derived from TMAP census data (JMJB 2013). Shown is the trend for the entire Wadden Sea (with trend line and 95% confidence interval) and trend for the four single Wadden Sea countries (only trend line). Trends cover year-round presence, i.e. the trend combines both numbers and the period that geese stay in the Wadden Sea. Numbers at the vertical axis refer to average number for the entire season from July to June.

White-fronted Goose



Since White-fronted geese are not part of the trilateral monitoring scheme, trilateral data here is not presented here. Based on data from the monthly goose counting scheme in The Netherlands, White-fronted geese have continued to increase in the northern part of the country, which also the Wadden Sea belongs to (Hornman et al. 2013). However, in line with the trend in the total flyway population, the annual growth rates have gone down considerably (on average 2,6% increase per annum since 2002/03, versus 5% since 1975/76). The recent increase to some extent is also caused by an advanced arrival in autumn. Nowadays, White-fronted geese arrive in large numbers by the end of September or early October, instead of November (Koffijberg et al. 2010).

Data from Lower Saxony point at a similar development as described above for The Netherlands (Kruckenberg & Kowallik 2008). Here, numbers present also depend on the character of the winter (in cold winters, many birds move to The Netherlands). Wintering numbers in the Wadden Sea area of Schleswig-Holstein and in Denmark are usually low.

Greylag Goose



Greylag Goose is one of the fastest increasing goose species in Europe (Fox et al. 2010). In The Netherlands, trends for the northern part of the country, which also the Wadden Sea is part of, point at annual growth rates of 10% since 1975/76. Recently, this rate of increase has only slightly gone down, to 8% since 2002/2003. This increase is caused by both increased migratory populations and an expanding native breeding bird population. Data from the Dutch monitoring scheme for breeding birds show annual increase rates of on average 22% and 21% for 1990-2011 and 2002-2011 respectively (Boele et al. 2013). In Schleswig-Holstein numbers of resting Greylag geese have increased in all seasons, too.

Although precise data are not available, we expect population developments in migratory numbers of Greylag geese in the other Wadden Sea countries to be similar as in The Netherlands. In Denmark the growth rate has clearly decreased since 2003/2004 (Laursen & Frikke 2013).

3. Analysis of problems with geese

3.1 Wadden Sea Area

The Wadden Sea Region is characterized by large areas of salt marshes and grasslands which have an important function as wintering and staging areas for Arctic and Nordic geese. Locally, some goose populations (notably Greylag Goose) also use the area for breeding. The agricultural conflicts with the increasing occurrence of geese on farmland in the Trilateral Wadden Sea Forum Region are visible in two basically different processes:

1. **Non-breeding.** The first process is rooted in the 1960s and 1970s, and stems from a period that several arctic breeding geese populations were declining with some even on the verge of extinction. Since then many populations have increased, partly because of improved protection measures, and partly by geese very successfully adapting to feed on agricultural habitats (see chapter 2.1).
2. **Breeding.** The second process concerns the increasing breeding numbers of temperate breeding geese populations, both native species (Greylag Goose, Barnacle Goose) and non-native species being regularly introduced (exotics) and/or domesticated (e.g. Egyptian Goose, Canada Goose) in the West European countries. This development started in the late 1960s, but boosted from the early 1990s onwards.

From an ecological point of view, the first process is most essential in the Wadden Sea, while the second is of minor importance. However, from the political and public point of view the second process constantly interferes with the first one. This makes it difficult to formulate policy strategies with respect to the first process without paying attention to the second one.

In a trilateral management framework, the first development is most essential. When management practices like scaring would only be carried out at a national level, goose conflicts are easily transferred across the border, as examples in the Dutch/German Lower Rhine area have shown in the past (Wille 1999). The general attitude towards geese, however, will also be determined by conflicts caused by breeding goose populations. A management scheme to deal with conflicts caused by breeding geese, however, is not foreseen in a trilateral context, as these conflicts are entirely of local scale (see chapter 1).



3.2 The four regions

Denmark

The Danish Wadden Sea is an internationally important staging area for Brent geese and Barnacle geese in autumn and spring. Furthermore, the area is important wintering area for Pink-footed geese and Greylag geese. Two subspecies of Brent geese occur in the Danish Wadden Sea: the dark-bellied (*Branta bernicla bernicla*) and the light-bellied (*B.b.hrota* from the Svalbard breeding population) Brent geese sub-species. During autumn, Brent geese mostly feed on intertidal mudflats, whereas in spring, they primarily feed on saltmarshes. The annual peak numbers of dark-bellied Brent geese fluctuate around 15,000, while light-bellied Brent geese numbers are 1-2000 at most. Both subspecies primarily occur inside NATURA 2000 sites and agricultural conflicts are limited.

Barnacle geese occur in autumn, winter and spring and annual peak numbers have increased from few hundreds in the 1980s to more than 60,000 in the 2000s, and numbers continue to increase. Barnacle geese used to depart from the Wadden Sea in the beginning of April but nowadays, the majority stays until mid-May (see also chapter 2.2). Barnacle geese forage on saltmarshes on foreshores as well as in polders on some Wadden Sea islands and along the mainland coast; flocks are nowadays seen along the riverine systems as far as 10 km inland, e.g. in pastures around Ribe and agricultural areas east of Skærbæk. The majority of Barnacle geese feed inside NATURA 2000 areas. Agricultural conflicts have increased locally, in particular on the island of Mandø but also in polders along the mainland where Barnacle geese forage on fertilised pastures and winter cereal fields.

Numbers of Pink-footed geese have decreased dramatically in the Danish Wadden Sea region which is primarily ascribed to the increasing numbers of Barnacle geese; Pinkfeet spread in general and a part of the population has relocated to wintering sites in western Jutland further north. Greylag geese have increased in the Danish Wadden Sea; most Greylags forage on the foreshores with little agricultural conflict.

Schleswig-Holstein

The Schleswig-Holstein part of the Wadden Sea is an important staging side for Dark-bellied Brent geese and Barnacle geese in autumn and spring. Greylag geese occur all year round. In contrast to that, White-fronted geese occur only locally. Brent geese concentrate in the northern part of the Wadden Sea (county of Nordfriesland), with highest numbers on the Halligen and islands. Barnacle geese are more evenly distributed along the Wadden Sea coast of Schleswig-Holstein with highest numbers in the vicinity of nature protection polders (Rickelsbüller Koog, Beltringharder Koog, Katinger Watt, Meldorfer Speicherkoog), on the peninsula Eiderstedt, and along the estuaries of river Eider and river Elbe. While Brent geese mainly feed on saltmarshes and intertidal mudflats, Barnacle geese also use grassland and arable fields behind the dike in substantial numbers. Most conflicts occur in spring, when Brent and Barnacle geese compete against farmers for the first grass yield. Most problems with Greylag geese occur on arable fields. To minimize conflicts between geese and agriculture, some agro-environmental schemes like the "Halligprogram", and "Feeding areas for geese and swans", (see inventory in Table 2 for details) and some programs adapted to the local situation, ("Geese field-pool" and "reduction of lease payments") have been developed. Suitable areas for geese have been created in the nature protection polders.

Lower Saxony

Both the Wadden Sea part and the mainly agricultural areas behind the dikes are visited traditionally by large numbers of geese coming from breeding grounds in Scandinavia, the Baltic States and the Russian arctic, Russia, and very far regions of the Arctic. During the last decades numbers of migrating geese, which use grassland and crops behind the dikes for feeding grounds, have been increased significantly (see chapter 2.1). Those birds occur mainly in late winter and early spring, when they are attracted from nutritious meadows and winter cereals, in particular after mild winter time. Moreover, a mild winter leads to a longer stay of the geese (i.e. geese depart from The Netherlands earlier in winter). What are the reasons? In recent decades during the late winter and early spring the quality of food increased, resulting in larger numbers of geese. Resources in these areas have been developed in favor of geese populations, which have to rest or to stay in regions of moderate climate. They rely upon undisturbed open landscapes, where they can put on essential fat depots for the next migration route. Increasing numbers of geese and an increasing proportion of those, who feed on arable land and grassland raised conflicts with farmers. Growing numbers of geese and subsequent expansion of feeding areas raised the impact on affected areas, and also the total area visited by migrating geese increased. This trend is most obvious for White-fronted geese and Barnacle geese (see also chapter 2.1). Barnacles concentrate on the Natura 2000 designated area, whereas White-fronted geese and Greylag geese also frequent large areas out of the Natura 2000 network. In the region of Ems-Dollard with a high proportion of extensive grassland, resting numbers of Barnacles reach more than 80,000 birds, White-fronted geese reach more than 60,000 birds.

On grassland, conflicts with large flocks of geese occur mainly before the first mowing. Normally, this mowing is the most important both for quantity and quality of the grass. Where feeding geese concentrate in large numbers and for a longer time, crops are reduced and damaged. Studies figured out that more than 80% percent of crop reduction happens during the spring migration period, whereas up to 20% percent occur in the autumn and winter time. Given the high numbers in late winter and early spring, Lower Saxony thus has a high potential for possible conflicts with agriculture.

On arable land, migrating White-fronted geese concentrate during the spring time, whereas Barnacles may occur all over the winter period. Crop reduction damage due to large numbers of resting and feeding geese concerns winter wheat, winter barley and rape.

Lower-Saxony's conservation regime is focused on the designation of go-areas for the migratory and wintering geese to provide and maintain resting and feeding grounds for Nordic migratory birds. The strategy is based on a high responsibility for the protection of these birds. Lower Saxony offers special agro-environmental schemes both to concentrate the geese on suitable areas and simultaneously to minimize the conflicts between agriculture and nature conservation. Following the agro-environmental schemes of the program, farmers have to fulfill different obligations on the contract area. Contracts are concluded for five years. Consequences of the toleration of feeding geese and the fulfilling of obligations are honored by payments per hectare.

The Netherlands

Non-breeding Dark-bellied Brent geese mainly cause problems on farmland during spring migration in April and May when they stage in the polders of the Wadden Sea islands of Texel, Terschelling, Ameland and Schiermonnikoog. Interference with farming also occurs in some small areas along the mainland coast. But this interference is of minor importance, since geese along the mainland coast are usually attracted by suitable vegetation on the salt marshes to feed on. The good grass quality on the mainland saltmarshes during April and May attracts the geese to graze on these saltmarshes rather than on inland grassland sites. The interference problems on the barrier islands are so far solved by paying the caused damage.

Non-breeding Barnacle geese have spread their distribution through the Dutch Wadden Sea area during the whole non-breeding period. The polders on the barrier islands are now also frequented regularly during winter. Since the early 1990s Barnacle geese frequent the Dutch part in larger numbers and they stage longer as well (up to Mid-May, see chapter 2.2). Winter damage on grassland on the barrier islands is limited. Crop damage during spring is mainly concentrated on farmland along the mainland coast. Especially extended dry periods (when vegetation on salt marshes is in poor condition and Barnacle geese also have to cope with increased salinity of salt marsh vegetation) force many geese to feed inland. Then damage can be caused on permanent grassland and e.g. spring winter wheat. The damage caused is estimated and compensated. Every year some lawsuits occur, when parties disagree.

Non-breeding populations of Greylag and White-fronted Goose along the Wadden Sea are much smaller and can often be found at harvest remains (notably sugar beet) in autumn, where no damage occurs. Both species might also frequent autumn-sown or spring-sown cereals (latter only migratory Greylag geese, which stay until mid-April), where damage is compensated. Greylag, Pink-footed and Bean Goose numbers are much smaller than the ones of Barnacle and Brent geese.

In the framework of the so-called "Beleidskader Faunabeheer", a national management scheme that aims to force wintering geese to concentrate in go-areas, derogation shooting has been carried out on Greylag Goose and White-fronted Goose. During 2005/06-2007/08 on average 34,000 White-fronted geese were shot, most of them in the interior parts of Friesland (away from the Wadden Sea coast). In the same period on average 84,000 Greylag geese were shot, with a clear tendency to increase in recent years (van der Zee et al. 2009). Shooting on Greylag geese is more spread over the country.

With respect to the reimbursements, every year some lawsuits occur, when parties disagree. It is 5-10 of a total of hundreds of reimbursements. For people opposing hunting there is also a problem with the yearly number of geese being shot.

Contrary to other countries, Natura 2000 sites for geese have only been considered in nature reserves, i.e. most sites situated within the Wadden Sea (salt marshes and natural vegetation at the barrier islands). In addition, coastal wetlands like Lauwersmeer and embanked areas (e.g. Polder Breebaart, Dollard) are part of the Natura 2000 network. Farmland, however, has not been designated. This applies both to the coastal marshes along the mainland coast, and to the polders at the islands.

This means that during parts of the year (notably during late autumn and in winter), a large proportion of geese is actually feeding outside the Natura 2000 network. Both the salt marsh areas and farmland behind the sea dike were also part of the feeding areas ("go-areas") in the goose management scheme ("Beleidskader Faunabeheer") from 2005/06 to 2012/13 (some also 2013/14), the latter only when grassland was involved. Crops were excluded in most go-areas, mainly because of financial reasons.

4. Policy developments

4.1 Overview inventory

Table 2 gives a summary of all relevant management aspects of geese in the Wadden Sea. Basically, the kind of agricultural conflict does not differ between the Wadden Sea countries, but the focus might differ according to species and part of the year when agricultural damage occurs. What do differ are several management regulations. In contrast to The Netherlands, Lower Saxony, Schleswig-Holstein and Denmark have also designated agricultural areas behind the seawall as Natura 2000 site. In The Netherlands, farmland areas have not been covered at all with Natura 2000, unless a part of a site was already designated as a nature reserve. The Netherlands also is the only country that has no open season for migratory geese, although large numbers are actually shot with special permits by derogation shooting (see chapter 3). Furthermore, The Netherlands is the only country that compensates goose damage by direct payments. Besides, since 2005/06 also agri-environment schemes have been introduced to accommodate geese on farmland. The latter approach is also practised in Lower Saxony and Schleswig-Holstein. The scale, in which their schemes work, however, is different from the Dutch approach. They only operate at a local level (specific conflict areas), whereas in The Netherlands there is one national policy. In Denmark, apart from a pilot-scheme for Barnacle geese, no specific goose management has been adopted so far.

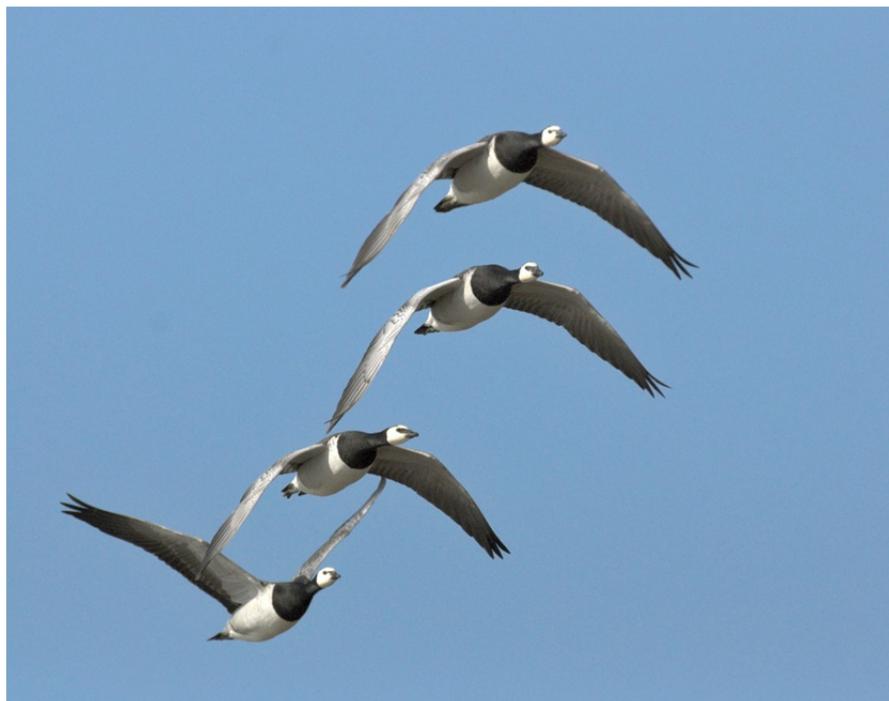


Table 4.1: Summary of goose management and related aspects in the Wadden Sea Region
 See **Annex 1** for full account on inventory of goose management

Management aspect	Denmark	Schleswig-Holstein	Lower-Saxony	The Netherlands
Overview of conflicts				
Focus goose species:	Barnacle Goose	Greylag Goose, Barnacle Goose; locally also Dark-bellied Brent Goose, (White-fronted Goose)	White-fronted Goose, Greylag Goose, Barnacle Goose, Dark-bellied Brent Goose	Greylag Goose, Barnacle, Barnacle Goose, Dark-bellied Brent Goose
Type of conflicts:	Crop damage, both to winter cereals (autumn, spring) and grassland (spring) occurring on islands (mainly Mandø), mainland polders and marshes	Crop damage (mainly winter cereals), loss in grass production and conflicts with livestock grazing (mainly late spring)	Crop reduction mainly in late winter/early spring due to grazing on arable fields (winter cereals) and meadows, in particular after/during mild winter time	Crop damage (mainly winter cereals), loss in grass production, conflicts with livestock grazing (mainly islands), conflicts with botanical values protected vegetation
Conservation regime				
Natura 2000 designation:	Wadden Sea and adjacent marshes designated as 8 SPAs. Qualifying species are Pink-footed Goose, Barnacle Goose, Dark- and Light-Bellied Brent Goose	Wadden Sea and coastal wetlands, Eiderstedt peninsula, forelands Elbe estuary and lowlands of Eider-Treene-Sorge designated as 5 SPAs. Qualifying species Barnacle Goose, Dark-bellied Brent Goose, Greylag Goose, White-fronted Goose	Wadden Sea and important agricultural areas behind the dike (crops/grassland) designated as 11 SPAs. Qualifying species Tundra Bean Goose, White-fronted Goose, Greylag Goose, Barnacle Goose, Dark-bellied Brent Goose	Wadden Sea designated as one SPA. Agricultural areas behind the dikes, both at islands and mainland are not part of SPAs. Qualifying species Tundra Bean Goose (only night-roosts), Greylag Goose, Barnacle Goose, Dark-bellied Brent Goose

Hunting regulations:	Open season for Bean Goose, Pink-footed Goose, White-fronted Goose, Greylag Goose, Canada Goose (all from 1/09-31/12). Limited derogation shooting of Barnacle geese with special permission (very limited in one area)	Open season for Greylag Goose (1/8-15/01 but 1/9-31/10 only on sensitive crops); White-fronted Goose (1/11-15/01), Canada Goose (1/8-15/01, but until 31/10 only on sensitive crops). Derogation shooting Barnacle Goose (01/10-15/01) outside SPA on sensitive crops and grassland only in the counties of Nordfriesland, Dithmarschen and Steinburg. On grassland the sensitivity has to be proven by experts. Derogation shooting outside the hunting season with special permission according to §24 national hunting law. At the moment the federal hunting law is under revision	Open season for Bean Goose, White-fronted Goose (1/11-15/1), Greylag Goose (1/11-15/1), Canada Goose (1/11-15/1). Derogation shooting on Greylag geese in August and Canada Goose from 1/9 to 1/11	No open season, hunting only as derogation shooting in framework of goose management policy (see below)
Spatial hunting restrictions:	No hunting in major parts of the Wadden Sea part of SPA (some salt marshes and all mud flats). No spatial hunting restrictions in polders/marshes behind the dikes	No hunting in the Wadden Sea national park and in nature conservation polders.	No hunting in SPAs	No hunting in SPAs, including derogation shooting

Goose management				
Direct payments for damage:	No	No	No	Yes – according to regulations Faunafonds and only in winter period
Agri-environmental schemes:	None, apart from pilot project on the island of Mandø, specifically related to Barnacle Goose	Different schemes adapted to local situation e.g. "Feeding areas for geese and swans", "resting areas on arable fields", "pasture management lowland marsh", "permanent pasture", "Halligprogramm"	Go-areas with specific regulations, applied within boundaries of SPA (PROFIL, 'nordic goose programme'). Payment per ha, differentiation between crops and grassland. Contracts for 5-year periods. Co-financed by EU	Go and No-go areas ("foerageergebieden", until 2012/13, partly 2012/14). Payment per ha for accommodating geese according to specific regulations. Contracts for 6-year periods. In future aim to be co-financed by EU
Other measures:	Scaring is performed by farmers in some areas – e.g. by the use of gas guns	Goose field-pool ("Gänseflächenpool"), Reduction of lease payment ("Pachtnachlass"), improvement of grassland in nature conservation-polders for geese		
Organisation of goose management and discussions of conflicts:	None	'Round tables geese and agriculture' with all stakeholders included	'Round table' once per year (Jan-Apr), prior to application for agri-env. scheme	Farmers' collectives. Management regionally co-ordinated by provinces (formerly Ministry of Economic Affairs). Co-ordination of payments for damage Faunafonds, to be transferred to the provinces.

4.2 Policies

The policy development concentrates around the already described two basic developments: (1) the successful recovery of the staging and wintering populations of geese in the Wadden Sea during autumn, winter and spring, and (2) the increase of breeding numbers, which might pose a potentially serious political problem in the area. In The Netherlands, in the public debate and the political arena both developments intermix constantly because of the high numbers involved, while they ask for basically different solutions. It is nearly impossible to ignore the second development when formulating solutions for the first one due to the public debate. Nevertheless, both developments require separate approaches in order to reach successful policy development. Breeding bird issues require local (national) management, while migratory bird issues (because of their cross-border occurrence) require an international management perspective (in the case of the Wadden Sea trilateral) (see also chapter 1).

4.3 Trends and possible conflicts

At least for Barnacle Goose and Greylag Goose, there are currently no signs that the upward trends will change and migratory bird numbers will stabilise in the near future. This is different for White-fronted Goose and Dark-bellied Brent Goose, for which further increases are not likely, given the current development of numbers and breeding success (see chapter 2.1). The increase in numbers of Greylag geese and Barnacle geese will probably cause a further expansion in their feeding range, moving away from the Wadden Sea coast to areas further inland (partly, this has already occurred, see chapter 2.2). To what extent seasonal occurrence will change is more difficult to foresee. Given the general tendency for milder winters, the period of stay in the eastern and northern parts of the Wadden Sea might expand in future, especially for wintering Barnacle, Greylag and White-fronted geese. In the past decades, many waterbird species have responded to a milder winter climate, by shifting their wintering range to the north (Maclean et al. 2008, Lehikoinen et al. 2013). This is also confirmed by an increase in e.g. wintering Greylag geese in southern Sweden (Nilsson 2013) and the Danish Wadden Sea (Laurson & Frikke 2013).

Both, increasing numbers and/or longer periods with high numbers and an expansion of feeding areas are likely to increase further conflicts with farming practises. If no action is taken the interference with agriculture and nature management will increase. Simultaneously, in agriculture, farms have become larger-scale and more efficient and geese are increasingly regarded as competitors.

If no actions are taken, it will result in increasingly conflicting situations with much misunderstanding and many people seeking their own solutions throughout the entire Wadden Sea. Moreover, problem solutions on one site might well cause problems on another site. Therefore, the implementation of a trilateral goose management scheme as well as concerted actions is required.

4.4 Policy cycle

Policy development invariably follows the same routines. Every organisation operates according to different policy and management cycles whether it will be a governmental or non-governmental body.

Agenda setting, policy preparation and policy formulation

A policy cycle starts with the recognition of existing problems or shortcomings, which is followed by a process of agenda-building, preparation of policy and policy formulation. The policy formulation includes own policy goals in relation to goals to be reached by other bodies and agreements: What do we want to have realized? And when do we want it to be realized? Present-day policy goals require SMART formulation (as good as possible): Specific, Measurable, Acceptable, Realistic and Time-bound. In a trilateral context the phase of decision-making requires answers on the questions 'Why (do we need to decide upon this item?)' and 'What (do we decide to be reached in due time?)'.

Policy effectuation

The phase of policy implementation concerns the question: '*How do we reach the goals?*' It is for the four countries within the Wadden Sea Region themselves to solve and organize the 'how'- questions. They then have already agreed on the trilateral policy goals with respect to goose management. In this phase the various partners define their own measures according to the goals. With respect to the accommodation and management of geese, we might well develop a toolkit with possible measures, based upon efficiency and effectiveness. The co-operating partners are free to choose their own approaches, as long as they reach the agreed common goals in their own region without negative effects on other regions. Trilateral efforts might well be needed after the decision-making in order to reach better international and improved judicial agreements.

Governmental bodies do have 5 basic instruments to their disposal:

1. organizing physical activities (i.e. constructing roads),
2. subsidizing activities with public money (i.e. enabling cultural activities),
3. public relation and communication (i.e. public messages),
4. directing and stimulating processes (i.e. organizing co-operation between interest groups)
5. law enforcement (i.e. (non-)allowance of activities in certain areas).

The choice of instruments depends on the policy goals, the expected effectiveness of the instruments and the seriousness of the problems. Often a mix of instruments is designed. Every region will need to develop its own mix of instruments depending on the instrumental possibilities and the possibilities for regional co-operation. In fact, the choice of instruments is less important as long as the agreed goals are reached.

Policy evaluation

In the evaluation phase all partners will compile the results for reporting. Effective evaluation requires (1) decision-making on the monitoring in the first phase and (2) adequate monitoring on output (budget, manpower) and outcome (population sizes and distribution, reduction of number of conflicts) throughout the process. The co-operating partners effectuate the monitoring activities required immediately at the start of the second phase of policy effectuation. We thus need to formulate what data need to be gathered of all partners in order to follow the effectiveness (output and outcome). The evaluation results might conclude on the policy cycle to be stopped due to (in) effectiveness, to be changed or to be continued in the same way. In the latter two cases the cycle starts again. In the first situation the policy cycle stops.



5. Strategy

Benefits of coordinated management of geese in the trilateral Wadden Sea Region

The Wadden Sea Region is one of the key areas for staging and wintering Nordic and Arctic geese in the western Palearctic and geese constitute an asset of high conservation and recreational value to the trilateral Wadden Sea. The fact that to a large extent they forage on farmland behind the dikes and consequently create conflicts with agricultural economic interests makes geese a special case for wildlife conservation and management. This calls for a careful and strategic treatment in order to balance the international conservation obligations with the benefits and costs of hosting the geese.

Firstly, so far the three Wadden Sea countries have not taken a concerted approach to the management of geese despite the fact that various larger-scale conservation and management decisions taken in one country may have knock-on effects in other countries – in terms of redistributing the geese. This incurs the risk of an uneven distribution of the burden of hosting geese between the countries.

Secondly, only by adopting an international perspective will it be possible to effectively identify and prioritize areas most suited to an integrated management approach, taking the necessary conservation actions for geese, while minimizing the economic costs. This can be undertaken by designing and designating priority goose areas with the right ecological conditions and minimal disturbance in the Wadden Sea. This will also involve ensuring that polders adjoining NATURA 2000 sites and management zones do not carry crops that are vulnerable to goose foraging.

Thirdly, by cooperation it will be possible to improve the mutual sharing of experience and learning as well as better integrating and taking advantage of monitoring and research in the management process.

5.1 Aims

The overall objective is to achieve the coordinated management of geese in the trilateral Wadden Sea using a strategic adaptive framework. Adaptive management is defined as an approach to managing natural systems that builds on learning – based on common sense, experience, experimenting and monitoring – by adjusting practices based on what was learned (Williams et al. 2009; Adaptive Management. US Dept Int Tech Guide).

This framework

- Ensures the maintenance of goose populations in a favourable conservation status according to the EU Birds Directive;
- Integrates geese in conservation and management objectives within the Wadden Sea and behind the dikes;
- Balances recreational and economic interests in an international perspective; and
- Increases the mutual sharing of management experience and learning by doing.

5.2 Specific objectives

The strategy contains the following specific objectives:

- Maintain populations of geese in accordance with national and international conservation obligations and policies; provide vital habitats for roosting and foraging with the aim of minimizing the cost of agricultural damage; maintain the range of geese with a perspective on the Wadden Sea Region;
- Provide an overview of goose distribution and areas of conflict as a tool to prioritize goose management zones in the integrated Wadden Sea Region;
- Promote and apply a 'go' and 'no-go' concept for the accommodation of geese in order to minimize agricultural conflicts;
- Evaluate societal costs (economic) and benefits (ecosystem services) of geese in the trilateral Wadden Sea Region;
- Establish an adaptive management framework for trilateral stakeholder collaboration;
- Establish a platform for collecting information and the effective sharing of experiences of goose management practices; and for communication of that knowledge.

5.3 Measures

Maintaining a trilateral Wadden Sea Goose Management Forum under the auspices of the Wadden Sea Forum to:

- Provide a basic overview of the distribution of geese in the trilateral Wadden Sea to be used for prioritization of go and no-go areas;
- Build the relevant capacity to predict, monitor and evaluate effectiveness of management actions (including scaring, creation of accommodation areas, subsidies, agri-environmental schemes); and
- Share experiences, communicate results and provide practical guidance to relevant stakeholders.



6. Recommendations for a 3-year time horizon (2014-2016)

Governance and Coordination

1. Denmark, Germany and The Netherlands continue the co-operation with respect to goose management on a structural basis in order to achieve good management of the wild goose populations in the tri-lateral Wadden Sea area.
2. The four governmental partners aim to agree on an ambitious and measurable target within two years, to reduce the present level of agricultural conflict.
3. The four governmental partners are responsible for the designation of the go-areas. Agreements between nature management, hunting and farming organizations should be drawn up and ratified.

Research and Monitoring

4. Promote a study of the societal costs and benefits of geese in the trilateral Wadden Sea region, to be conducted in 2014-2015.
5. Promote a joint trilateral research project to prioritize go-areas throughout the Wadden Sea region as well as to assess damage caused by geese and under which conditions the damage was caused.
6. Additionally to the Trilateral Monitoring and Assessment Programme (TMAP), development of a comprehensive trilateral goose monitoring and evaluation system with regard to further species resting and feeding behind the dikes. This will be overseen by the Goose Management Group of the Wadden Sea Forum. The monitoring system also considers estimates of agricultural damage.
7. Evaluation of the developments will take place every 4 years under the responsibility of the Goose Management Group of the Wadden Sea Forum, starting in 2016. This one has to be considered as the starting point.

Measures and Actions

8. Every governmental partner develops a management plan for non-breeding geese based on the designation of go and no-go areas. These four individual management plans complement each other and must primarily include designated go and no-go areas for at least 80% of the total number of goose-days in the region.
9. Every governmental partner actively develops additional instruments for a policy to reduce damage caused by geese outside the go areas and increase the attractiveness of go areas both for geese and farmers. This development will be a co-operative effort with the regional hunting, nature management and farming organizations.
10. The hunting, farming and nature management organizations in the Wadden Sea Region jointly develop or advise on techniques to scare geese in no-go areas.
11. The co-operating farming, nature management and hunting organizations per region take responsibility to develop a specific set of effective and efficient instruments in order to reach the goals formulated under point 2. This set of instruments will be brought together for the whole trilateral community.
12. The nationally selected go-areas shall be combined with the development of the set of instruments which will result in a trilateral management plan for the geese populations in the trilateral region under the responsibility of the Goose Management Group of the Wadden Sea Forum.

7. References

- Abraham, K., Jefferies, R.L. & Alisauskas, R. 2005. The dynamics of landscape change and snow geese in mid-continent North America. *Global Change Biology* 11: 841–855. doi: 10.1111/j.1365-486.2005.00943.x
- Austin, I.M.D., Rehfisch, G.E., Blew, J., Crowe, O., Delany, S., Devos, K., Deceuninck, B., Gunther, K., Laursen, K., van Roomen, M. & Wahl, J. 2008. Climate change causes rapid changes in the distribution and site abundance of birds in winter. *Global Change Biology* 14: 2489-2500.
- Blew, J., Günther, K., Hälterlein, B., Kleefstra, R., Laursen, K., Scheiffarth, G. 2013. Trends of Migratory and Wintering Waterbirds in the Wadden Sea 1987/1988 - 2010/2011. Wadden Sea Ecosystem No. 31. Common Wadden Sea Secretariat, Joint Monitoring Group of Migratory Birds in the Wadden Sea, Wilhelmshaven, Germany.
- Boele, A., van Bruggen, J., van Dijk, A.J., Hustings, F., Vergeer, J.W., Ballering, L. & Plate, C.L. 2013. Broedvogels in Nederland in 2011. Sovon-rapport 2013/01. Sovon Vogelonderzoek Nederland, Nijmegen.
- Ebbing, B.S., Blew, J., Clausen P., Günther K., Hall, C., Holt, C., Koffijberg, K., Le Dréan-Quenec'hdu, S., Mahéo, R. & Pihl, S. 2013. Population development and breeding success of Dark-bellied Brent Geese *Branta b. bernicla* from 1991–2011. *Wildfowl Special Issue* 3: 74-89.
- Eerden, van M.R., Drent, R.H., Stahl J. & Bakker J.P. 2005. Connecting seas: western Palaearctic continental flyway for water birds in the perspective of changing land use and climate. *Global Change Biology* 11: 894–908. doi: 10.1111/j.1365-2486.2005.00940.x
- Eichhörn, G., Afanasyey, V., Drent, R.H. & van der Jeugd, H.P. 2006. Spring stopover routines in Russian barnacle geese *Branta leucopsis* tracked by resightings and geolocation. *Ardea* 94: 667-678.
- Fox, A.D., Madsen, J., Boyd, H., Kuijken, E., Norris, D.W., Tombre I.M. & Stroud D.A. 2005. Effects of agricultural change on abundance, fitness components and distribution of two arctic-nesting goose populations. *Global Change Biology* 11: 881–893. doi: 10.1111/j.1365-2486.2005.00941.x
- Fox, A.D., Ebbing, B.S., Mitchell, C., Heinicke, T., Aarvak, T., Colhoun, K., Clausen, P., Dereliev, S., Faragó, S., Koffijberg, K., Kruckenberg, H., Loonen, M., Madsen, J., Mooij, J., Musil, P., Nilsson, L., Pihl, S. & van der Jeugd, H. 2010. Current estimates of goose population sizes in western Europe, a gap analysis and an assessment of trends. *Ornis Svecica* 20: 115-127.
- Goose Management Group (WSF). 2010. Recommendations and guidance for the development of a goose management plan for the trilateral Wadden Sea Region.
- Günther, K. 2010. Rastvogel-Monitoring im Schleswig-Holsteinischen Wattenmeer 2009. Report to the Nationalparkverwaltung, Landesamt für Küstenschutz, Nationalpark und Meeresschutz.

Hornman, M., Hustings, F., Koffijberg, K., Klaassen O., van Winden, E., Sovon Ganzen- en Zwanenwerkgroep & Soldaat, L. 2013. Watervogels in Nederland in 2010/2011. Sovon-rapport 2013/02. Waterdienst-rapport BM13.01. Sovon Vogelonderzoek Nederland, Nijmegen.

Jeugd, van der, H.P. 2012. Populatiodynamische parameters van Brandganzen in Nederland. Vogeltrekstation-rapport 2012-02. Vogeltrekstation, Wageningen.

Kieckbusch, J. 2012. Gänse und Schwäne in Schleswig-Holstein – Lebensraumsprüche, Bestände und Verbreitung. Landesamt für Landwirtschaft, Umwelt und ländliche Räume, Flintbek.

Koffijberg, K., Beekman, J., Cottaar, F., Ebbinghe, B., van der Jeugd, H., Nienhuis, J., Tanger, D., Voslamber, B. & van Winden, E. 2010. Doortrekkende en overwinterende ganzen in Nederland. *De Levende Natuur* 111: 3-9.

Koffijberg, K. & Günther, K. 2005. Recent population dynamics and habitat use of Barnacle Geese and Dark-bellied Brent Geese in the Wadden Sea. In: Blew, J. & Südbeck, P. *Migratory waterbirds in the Wadden Sea 1980-2000*. Wadden Sea Ecosystem 20. CWSS & JMMB, Wilhelmshaven.

Kruckenbergh, H. & Kowallik, C. 2008. Verdrängen Weißwangengänsen *Branta leucopsis* die Blässgänse *Anser albifrons* aus ihren Nahrungsgebieten am Dollart? *Vogelkdl. Ber. Niedersachs.* 40: 417-426.

Lehikoinen, A., Jaatinen, K., Vahatalo, A. V., Clausen, P., Crowe, O., Deceuninck, B., Hearn, R., Holt, C. A., Hornman, M., Keller, V., Nilsson, L., Langendoen, T., Tomankova, I., Wahl, J. & Fox, A. D. 2013. Rapid climate driven shifts in wintering distributions of three common waterbird species. *Global Change Biology* 19: 2071-2081.

Laursen, K., Blew, J., Eskildsen, K., Günther, K., Hälterlein, B., Kleefstra, R., Lüerßen, G., Potel, P. & Schrader, S. 2010. *Migratory waterbirds in the Wadden Sea 1987-2008*. Wadden Sea Ecosystem 30. CWSS & JMMB, Wilhelmshaven.

Laursen K. & J. Frikke, 2013. Rastende vandfugle I Vadehavet 1980–2010 – status, beskyttelse, benyttelse og påvirkninger. *Dansk ornitologisk Tidsskrift* 107, nr. 1 – 2013, p. 1-184.)Maclean,

Madsen, J. & Williams, J.H. (Compilers). 2012. *International Species Management Plan for the Svalbard population of the Pink-footed Goose *Anser brachyrhynchus**. AEW Technical Series No. 48. Bonn, Germany.

Madsen, J., Cracknell J. & Fox, A.D. (eds) 1999. *Goose populations of the Western Palearctic. A review of status and distribution*. Wetlands International Publ. 48, Wetlands International, Wageningen & National Environmental Research Institute, Rønde, Denmark.

Nilsson, L. 2013. Goose counts in Sweden 1977/78–2011/12. *Ornis Svecica* 23: 3-60.

Wille, V. 1999. *Grenzen der Anpassungsfähigkeit überwinternder Wildgänse an antropogene Nutzungen*. Cuvillier Verlag, Göttingen.

Zee, van der, F.F., Verhoeven, R.H.M. & Melman, D. 2009. *Samenvatting evaluatiebeleid 2005-2008 overwinterende ganzen en smienten*. Rapport 2009/dk20. Directie Kennis, Ede.

Goose Management Group

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Inventory Goose Management in the Wadden Sea Region

A. DENMARK

1. Policy development

Basic contents of present goose management in Denmark:

- All species are covered by the law on hunting and wildlife management.
- Of the species occurring regularly 3 are fully protected and 5 have an open season.
- The protected species (populations) are:
Barnacle Goose, Dark-bellied Brent Goose and Light-bellied Brent Goose (+ Lesser White-fronted Goose)
The species with an open season are:
Greylag Goose: 1/9 – 31/12
White-fronted Goose: 1/9 – 31/12
Bean Goose: 1/9 – 31/12
Pink-footed Goose: 1/9 – 31/12
Canada Goose: 1/9 – 31/12
- Scaring and regulation by shooting is also regulated by the law on hunting and wildlife management.
- One dispensation to regulate a protected species (Barnacle Goose) by shooting (10 individuals) has been given to a farmer in the Tønder Marsh area south of Højer in 2011.
- In 2012/2013 more dispensations to regulate Barnacle Goose have been given
- The Nature and Game Reserve Wadden Sea includes regulations of human activities like hunting, but covers exclusively land areas outside the sea dikes and the sea territory below daily mean high tide.
- This gives primarily protection to the species which are depending on saltmarshes and tidal flats, i.e. Barnacle Goose and the two races of Brents.
- The marshes in the embanked areas along the coast are not protected by the nature protection law, but do have status as N2000-areas. The only direct regulation is the law on hunting and wildlife management.
- The Wadden Sea and the adjacent marine saltmarsh areas and the embanked areas behind the dikes are all parts of the Natura 2000 network. In this context the following SPA's (EU Bird Protection Areas) with goose species as parts of the conservation objectives are found in the Danish Wadden Sea area:

SPA N51	"Ribe Holme og enge ved Ribe Å og Kongeåen" (the Ribe Marsh): Pinkfooted Goose (mig);
SPA N52	"Mandø": Dark-bellied Brent Goose;
SPA N53	"Fanø": Light-bellied Brent Goose;
SPA N55	"Skallingen og Langli": Dark-bellied Brent Goose;

SPA N57	"Vadehavet" (The Wadden Sea): Barnacle Goose, Dark-bellied Brent Goose and Light-bellied Brent Goose;
SPA N60	"Vidåen, Tøndermarsken og Saltvandssøen" (the Tondern Marsh and the Saltwater Lagoon): Pink-footed Goose, Greylag Goose and Barnacle Goose;
SPA N65	"Rømø": Dark-bellied Brent Goose;
SPA N67	"Ballum Enge" (Ballum Marsh): Pink-footed Goose and Barnacle Goose.

The instruments for the protection and management of the areas are mainly consisting of habitat protection and improvements.

Agro-environmental schemes including toleration (feeding) of geese has been discussed, and a preliminary scheme was introduced to farmers dealing with the extraordinary pressure from Barnacle Geese on the island of Mandø.

No general solutions regarding goose management so far.

The responsible ministries have so far not launched any sufficient instruments to solve problems attached to the goose damage complex problems.

Scientific experiments with acoustic scaring of Barnacle Geese in farmland in the polder area in the Ballum Marsh in 2012 – 2013

2. Communication and awareness

2.1 Farmers

Farmers are in general very communicating about their increasing problems with the growing resting and wintering goose populations in the area. Geese have adapted to agricultural, arable fields/land as foraging areas, geese have changed their behaviour (adaption to human activities etc.) and geese have changed their spatial and temporal distribution in the Wadden Sea area. A conflict has been born.

2.2 General public

The public is in general divided on the subject of growing goose populations and goose damage to agriculture. Some do agree with the farmers, but a part of the population find it interesting to have more geese and to see geese more often than earlier.

Due to changes in behaviour, the geese are also less shy and more visible.

2.3 Local politicians

Local politicians are engaged and aware of the problematics and they want action in direction of solutions. However, the local politicians (municipal level) are not responsible in terms of economics and legislation.

Farmer organisations are engaged and aware of the situation, and want action and compensation for the losses caused by goose grazing.

NGO's, like the Danish Ornithological Society, are watching the management of the protected geese, and point out the obligations and responsibilities according to the EU Birds Directive.

2.4 Awareness

The awareness of increasing occurrence of wintering Arctic geese in agricultural areas and the damage they causes is high and the problem is well known.

The subject is often discussed in public and political organs, which often leads to focus in the press.

It has recently twice been a subject in The National Board of Wildlife.

The demand for actions and management is rising.

3. Measures

Agri-environmental pilot scheme in relation to damage caused by foraging Barnacle geese on the island of Mandø; includes only private owned land.

Regulation by dispensation from the Danish law on hunting and wildlife management has occurred in a few cases (see under 3.8 Hunting).

3.1 Focus species

The only species in focus is the Barnacle Goose

3.2 Size of areas

Approx. 200 ha on the island of Mandø - mainly grassland

3.3 Number of farmers involved

Approx. 6 farmers involved in the possible goose scheme, but no contracts have been established.

3.4 Time period of contracts

Duration of 5 years

3.5 Period of year

Spring (to avoid reduction in grass production in dairy cattle grazing fields and fields for hay production)

3.6 Payments & conditions for payments

Payment: 600 DKK per ha/year on top of the general payment to farmlands.

Conditions: Toleration of geese foraging in agricultural land.

The pilot scheme has not been popular amongst farmers, and so far no contracts have been established.

3.7 Scaring methods including in Natura 2000 sites

Scaring by shooting a number of individuals, also in Natura2000. By Danish law open season on Greylag Goose, Pinkfooted Goose and White-fronted Goose.

Gas guns/canons are used in several areas by farmers.

If farmers join the agri-environmental pilot scheme on the island of Mandø, they are not allowed to scare.

Scientific programme testing acoustic scaring methods in the Wadden Sea area.

3.8 Hunting

License to kill 20-30 Barnacle Geese (a protected species) by Danish law up to 2013.

If joining the agri-environmental pilot scheme on the island of Mandø –no hunting of Barnacle Goose is allowed in these areas.

4. Knowledge

4.1 Species

In the Danish Wadden Sea area:

- Barnacle Goose: Significant increase and spreading
- Brent Goose: Slight decrease or stable
- Greylag Goose: Increase
- Pink-footed Goose: A decrease over the last decade. Spreading in the area.
- White-fronted Goose: Increase

4.2 Flyway trends

See chapter 2

4.3 Productivity

Unknown

4.4 Trends in numbers

Wadden Sea trends from springtide counts and international goose counts. The Danish wintering population of Barnacle Goose has been increasing steadily since 1990 (Laursen & Frikke 2013).

4.5 Counting efforts

- Monthly springtide counts in selected areas
- Total Wadden Sea counts 2-4 times per year
- International counting dates midwinter, March (Barnacle geese), May (Brent Geese) and September (Greylag Geese) coordinated via the National monitoring programme (NOVANA)

4.6 Conflicts with other species

No data so far. Potential influence to breeding meadow birds in marshes and polders with a high grazing intensity by Barnacle Geese in spring (in particular at the island of Mandø).

B. LOWER SAXONY

1. Policy development

Basic guidelines of the geese policy in Lower Saxony:

Aims:

Providing and maintaining of rest-and feeding grounds for Nordic migratory birds roosting and/or overwintering on cultivated land. The main focus is on Nordic geese and swans, which Lower Saxony has a high responsibility for protection. Special agro-environmental schemes aim both to concentrate these birds on suitable areas and simultaneously minimize potential conflicts between agriculture and nature conservation.

Background of these targets is PROFIL – Lower Saxony's program for rural landscape development, based and co-financed from the EU-Fonds 'ELER'. Period: 2007 – 2013, a follow-up is going to be planned from 2014 onwards. Within PROFIL the Ministry of Environment, Energy and Climate offers a Nature Protection Co-operation Program with farmers, called 'Nordic Geese', which is focused on areas of the Natura 2000 network. In order to reach the conservation targets the program offers special agreements to farmers within selected areas, in which geese as migratory birds are dominant. Designated areas are defined by the Ministry and are mainly restricted on Special Protection Areas (SPA, see below). Following the agro-environmental schemes of the programme, cultivators have to fulfill different obligations on the designated area. Payment doesn't require actual feeding of geese on the contract area. Contracts are concluded for five years.

Special Protection Areas (SPA) in Lower Saxony: There are 15 SPA's focussing on geese as value defining bird species. They cover an area of 473.900 hectares totally and are go-areas without any scaring:

SPA 01	"Niedersächsisches Wattenmeer" (354.881 ha)
SPA 03	"Westermarsch" (2.538 ha)
SPA 04	"Krummhörn" (5.775 ha)
SPA 06	"Rheiderland" (8.684 ha)
SPA 09	"Ostfriesische Meere" (5.922 ha)
SPA 10	"Emsmarsch von Leer bis Emden" (4.019 ha)
SPA 18	"Untereibe" (16.715 ha)
SPA 27	"Unterweser" (3.838 ha)
SPA 35	"Hammeniederung" (6.296 ha)
SPA 37	"Mittlereibe" (34.010 ha)
SPA 39	"Dümmer" (4.629 ha)
SPA 42	"Steinhuder Meer" (5.326 ha)
SPA 63	"Seemarsch zwischen Norden und Esens" (8.043 ha)
SPA 64	"Marschen am Jadebusen" (7.711 ha)
SPA 65	"Butjadingen" (5.443 ha)

Additionally, there are further SPA's with regular occurrence of geese, but without leading to a value defining status within these areas. They cover an area of another 7.966 hectares and are go-areas without any scaring as well:

SPA 07	"Fehntjer Tief" (2.312 ha)
SPA 11	"Hunteniederung" (1.080 ha)
SPA 16	"Emstal von Lathen bis Papenburg" (4.574 ha)

2. Communication and awareness

2.1 Farmers

Round tables: At least annual discussions related to all selected areas, where the agro-environmental schemes are running. Main topics are the current status and the development of resting/overwintering geese, the status of the scheme contracts, new aspects of the schemes, and the exchange of experiences. Round tables take place between January and April, in order to inform and discuss all aspects before the deadline for annual applications (15 May).

Online information:

The Ministry's website

http://www.umwelt.niedersachsen.de/portal/live.php?navigation_id=2691&article_id=9150&_psmand=10 offers detailed information about all aspects of the co-operation program 'Nordic Geese' including application forms for farmers.

2.2 General public

Public awareness is reached by varied information actions from different partners. They include online information, leaflets, press releases, and guided tours to resting and overwintering places of geese offered by NGO's.

2.3 Local politicians

Local politicians are regularly involved, where the number of resting and wintering geese is expected to touch human activities and to cause damage to agriculture

2.4 Awareness

3. Measures

Agro-environmental schemes which include toleration of feeding geese. Problems are solved by local measures adapted to the local situation – no general solutions.

Special agreements for arable land (FM-No. 421 of the Nature Protection Co-operation Program 'Nordic Geese', financed by ELER: 50 % EU, 50 % Lower Saxony)

Special agreements for grassland (FM-No. 422 of the Nature Protection Co-operation Program 'Nordic Geese', financed by ELER: 50 % EU, 50 % Lower Saxony)

3.1 Focus species

Arable land: Mainly White-fronted Goose, Barnacle Goose, Brent Goose (all dominating along the coast), Greylag Goose, and other Nordic migratory birds

Grass land: Mainly White-fronted Goose, Barnacle Goose, Brent Goose (all dominating along the coast), Greylag Goose, and other Nordic migratory birds

3.2 Size of areas

Arable land:

7.464 ha (2012)

1.877 ha (2008)

Grass land:

13.553 ha (2012)

3.802 ha (2008)

3.3 Number of farmers involved

Arable land:

153 farmers (2012)

109 farmers (2010)

Grass land:

424 farmers (2012)

322 farmers (2010)

3.4 Time period of contracts

5 years

3.5 Period of year

All year round

3.6 Payments & conditions for payments

Arable land:

- No cultivation from 1 November – 31 March (in front of the dike until 30 April)
- No acoustic scaring or other disturbance of Nordic migratory birds in both the contract area and any other area of the agricultural holding within the designated zone. (Note: beyond contract area local application of scarecrow or plastic barrier tape is allowed.)
- No storage of machines, tools, equipment, dung, silage etc.
- Cultivation of winter crop (no autumn-sown rye) and at least 1x rape within five years. Sowing until 15 October latest.
- Some exception for special areas on manure and plant treatment with chemical substances (with or without payment deduction).
- Payment per year up to 290 €/ha and year. The premium is reviewed every two years (next: 1 January 2013).

Grass land:

- Only areas for agricultural output (grazing or forage cultivation), over a period of five years onwards
- No cultivation from 1 November – 31 March (in front of the dike until 30 April). The restriction includes any replacement of the grassland or sod management (e.g. rolling) during this period.
- No acoustic scaring or other disturbance of Nordic migratory birds in both the contract area and any other area of the agricultural holding within the designated zone. (Note:
 - beyond contract area local application of scarecrow or plastic barrier tape is allowed.)
 - No storage of machines, tools, equipment, dung, silage etc.
 - Mowing at least once a year, or grazing
 - Some exception for special areas on manure, ditch and brush wood groins cultivation/cleaning and grazing (with or without payment deduction).
- Payment per year up to 250 €/ha and year. The premium is reviewed every two years (next: 1 January 2013).

3.7 Scaring methods including in Natura 2000 sites

No scaring in the go-areas. Toleration of geese and other Nordic migratory birds.

3.8 Hunting

Regular hunting normally allowed, in SPA following the protection regulation.

4. Knowledge

4.1 Species

Ranking of goose species from numbers determined during the annual Synchronous Count of Geese and Swans (see 4.5): Barnacle Goose, White-fronted Goose, Greylag Goose, Bean Goose, Brent Goose.

Barnacle and White-fronted Goose are the dominating species along the costal marsh. Barnacles often concentrate on Special Protection Areas (SPA).

4.2 Flyway trends

No information available

4.3 Productivity

Unknown

4.4 Trends in numbers

Regional trends for Lower Saxony are difficult to assess. Numbers from the regular water bird counts (see below) are still analysed from 2009 onwards (not yet available due to reconstruction of the water bird database). Numbers from the Synchronous Count of Geese and Swans (see below) are influenced basically from regional weather conditions, and therefore have to be considered within a broader frame of the Atlantic overwintering area of each goose species.

In general, there are decreasing numbers from White-fronted Goose for several years, but increasing annual maximum numbers in some areas like 'Rheiderland' (SPA 06). Numbers from Barnacle Goose have generally been increasing in specific 'geese areas for several years', but not everywhere (e.g. decreasing numbers in 'Rheiderland' in years between). During mild winter an increasing part of birds is staying in Lower Saxony.

4.5 Counting efforts

- (1) Water Bird Count: every two weeks throughout the year, designated areas, co-ordinated by 'Staatliche Vogelschutzwarte'
- (2) Synchronous Count of Geese and Swans: twice a year (January, March), compiled by 'Staatliche Vogelschutzwarte' together with more than 20 regional co-ordinators
- (3) ornitho-database (www.ornitho.de)

4.6 Conflicts with other species

unknown

C. SCHLESWIG-HOLSTEIN

1. Policy development

Basic guidelines of the geese policy in Schleswig-Holstein:

Protection measures:

Main focus on endangered species for which Schleswig-Holstein has a high responsibility (mainly Brent goose);

SPAs: focus on the species listed in the conservation objectives (only SPAs in the western part of SH are listed):

SPA "Ramsargebiet schleswig-holsteinisches Wattenmeer und angrenzende Küstengebiete" (DE 0916-491): Brent Goose, Barnacle Goose;

SPA "Eiderstedt" (DE 1618-404): Barnacle Goose;

SPA "Vorland St. Margarethen" (DE 2121-402): Barnacle Goose;

SPA "Untereibe bis Wedel" (DE 2323-401): Greylag Goose, White-fronted Goose, Brent Goose, Barnacle Goose;

SPA: go areas without scaring;

Agro-environmental schemes which include toleration of feeding geese (see below for details in ANNEX 1);

Problems are solved by local measures adapted to the local situation – no general solutions (see below for details);

Other protection objectives (e.g. breeding meadow birds) are considered

2. Communication and awareness

2.1 Farmers

Round table:

"Geese and agriculture": (invited by the Ministry of Energiewende, agriculture, environment and rural landscapes Schleswig-Holstein) farmers organisation, hunters association, nature conservation organisations, authorities

2.2 General public

"Brent Goose days"

- annually in April/May since 1988 in the "Biosphäre Halligen"

- organised by local authorities, national park administration and nature conservation organisations;

- guided excursions, lectures, variety of events around the Halligen (theatre, dinner, music,...)

->www.ringelganstage.de

"Barnacle Goose days"

- 22.-31.October 2010
- events in Rickelsbüller Koog, Husum, Katinger Watt and Eiderstedt (Westerhever)
- organised by local authorities, national park administration and nature conservation organisations;
- guided excursions, lectures, variety of events

"Geese in the river Elbe estuary"

- NABU Haseldorf (NGO) Elbmarschenhaus
- guided excursions and lectures with information about wintering geese
- > www.elbmarschenhaus.de

"Geese and swans in Schleswig-Holstein"

Booklet about numbers, distribution, protection, observation sites of geese and swans in Schleswig-Holstein

2.3 Local politicians

2.4 Awareness

3. Measures

Agro-environmental scheme:

- "Feeding areas for geese and swans - grassland" (Nahrungsgebiete für Gänse und Schwäne)
- "resting areas for migratory bird species – arable fields"
- "pasture management on lowland grassland" ("Weide-Wirtschaft Marsch")
- "pasture-landscape lowland grassland" ("Weide-Landschaft Marsch")
- "permanent pasture" ("Dauerweide")

"Halligprogramm"

Goose field-pool ("Gänseflächenpool")

Reduction of lease payment ("Pachtnachlass")

Shooting to scare

Shooting according to § 27 federal hunting law

3.1 Focus species

Barnacle Goose, Greylag Goose, Whooper Swan, White-fronted Goose, Canadian Goose, Bean Goose, Brent Goose

3.2 Size of areas

Approx. 12745 ha

3.3 Number of farmers involved

Approx. 552 farmers

And 19 shepherds

3.4 Time period of contracts

Between 1 and 7 years, mainly based on 5 years

3.5 Period of year

Mainly all year round for the mentioned special agro-environmental scheme, except shooting to scare: Outside the regular hunting season and 1.oct-15.jan.

3.6 Payments & conditions for payments

Range from 40,- to 365,- €/ha/y depending on the special agro-environmental scheme

3.7 Scaring methods including in Natura 2000 sites

No scaring, toleration of geese, swans and ducks depending on the special agro-environmental scheme

3.8 Hunting

- Mainly regular hunting allowed depending on the special agro-environmental scheme
- no hunting on "Halligprogramm" and "Gänseflächenpool"
- shooting to scare and shooting accounting to federal hunting law: only to prevent damages from susceptible arable fields or grassland and only by permission

4. Knowledge

4.1 Species

4.2 Flyway trends

4.3 Productivity

4.4 Trends in numbers

4.5 Counting efforts

4.6 Conflicts with other species

D. THE NETHERLANDS

1. Policy development

Basic content of the Dutch geese policy

Aims:

To reach sustainable management of the Dutch geese populations by finding a balance between the size of the naturally occurring populations and the associated risks. This includes:

- The reduction of damage to the level of 2005 in 5 years' time;
- The planned reduction of resident geese to an acceptable level;
- The planned removal of the populations of exotic and domesticized geese.

It will result in (1) a strongly diminished need for population reduction, (2) no longer need to shake eggs after 5 years and (3) in meeting the international obligations with respect to the migrating species being present in the Netherlands.

The co-operating parties aim to obtain co-financing out of the European POP3-program in order to effectuate the policy of go-areas based on co-operatives (an additional 30% of the crop damage costs).

Geese on migration and during winter:

Distinction between go- and no go-areas.

2. Communication and awareness

2.1 Farmers

An agreement has been concluded between 7 parties in December 2012 including the provinces, nature management organizations and the largest Dutch farming organization LTO. However some smaller farmer's organisations do not agree.

2.2 General public

The agreement is not supported by most animal welfare organisations.

2.3 Local politicians

Local politicians are engaged and aware of the problems, but they are not responsible in terms of economics and legislation.

2.4 Awareness

The increasing occurrence of wintering Arctic geese receives a lot of attention especially with respect to the longer spring-staging period of Barnacle geese in agricultural areas resulting in increasing damage. The same is true for the increasing breeding numbers.

The subject is often discussed in public and political organs, which often leads to focus in the press.

The countrywide policy is evaluated in 2009 (i.e.

- <http://www.wageningenur.nl/nl/Publicatie-details.htm?publicationId=publication-way-333832333738>), and
- 75 other Alterra-publications, and
- http://www.sovon.nl/sites/default/files/doc/Evaluatie%20Opvangbeleid%202005-2008%20overwinterende%20ganzen%20en%20smienten_deelrapport5_rap2008_20.pdf & 12 other SOVON-publications).

Effective communication will start when the negotiations between parties are finished.

3. Measures

- Goose management is appointed in regional co-operative committees.
- The national ceiling of damage control payments is 12.5 million euro's.
- Yearly progress interviews will be held on the basis of previously defined yearly goals
- The policy will be evaluated in autumn 2015.

Geese on migration and during winter:

1. Provinces delineate the go-areas.
2. Migrants and wintering geese are not disturbed by any means in the go-areas during migration and winter.
3. During winter no hunting allowed except for scaring with supported shooting in order to protect vulnerable crops.
4. Scaring measures are not needed for compensation.
5. Structural grassland is not considered as vulnerable crops.
6. Damage in go-areas compensated for 100%.
7. Damage caused by migrating or wintering outside go-areas and by breeding geese or exotics during summer will be compensated for 95%.
8. The national ceiling of damage control payments is 12.5 million euro's.

Geese during summer:

1. Main goal is the reduction of damage, while disturbance and other ecological damage should be avoided as much as possible.
2. Shooting of breeding pairs of greylag and barnacle geese is allowed from 1 March onwards, although it might be decided to start a month earlier.
3. Exotic species and domesticized greylags will be hunted by all legal means all year round.
4. Damage caused during summer will be compensated for 95%.
5. It will be tried by the provincial and national authorities to receive approval for the use of CO₂ for intoxication in a European and national context.

3.1 Focus species

Migration & winter: Greylag Goose, Barnacle Goose, White-fronted Goose, Bean Goose, Brent Goose

Breeding: Greylag Goose, Barnacle Goose

Exotic species: White-fronted Goose (summer), Egyptian Goose, Canada Goose, Indian Goose, domesticated Greylag Goose.

3.2 Size of areas

Go-areas: approximately 65.000 ha.

3.3 Number of farmers involved

The nationwide policy and measures taken concern all farmers.

3.4 Time period of contracts

3.5 Period of year

Geese on migration and during winter:

1. Winter period in North part Netherlands defined between 1 November and 1 March.
2. Distinction between go- and no go-areas.
3. Resting period for geese in go-areas of N part Netherlands between 1 November and 15 May and in the Wadden area between 1 November and 15 June.

Geese during summer:

Summer period in N part Netherlands defined between 1 March and 1 November.

3.6 Payments & conditions for payments

Geese on migration and during winter:

1. Damage in go-areas compensated for 100%.
2. Damage caused by migrating or wintering outside go-areas and by breeding geese or exotics during summer will be compensated for 95%.
3. The national ceiling of damage control payments is 12.5 million euro's.

Geese during summer:

4. Damage caused during summer will be compensated for 95%.

3.7 Scaring methods including in Natura 2000 sites

No scaring methods are allowed in the go-areas.

Several scaring methods in the no go-areas.

3.8 Hunting

4. Knowledge

4.1 Species

4.2 Flyway trends

4.3 Productivity

4.4 Trends in numbers

4.5 Counting efforts

4.6 Conflicts with other species

SCHLESWIG-HOLSTEINs Agro-environmental schemes as detailed example

3a. Measures	Agro-environmental scheme "Feeding areas for geese and swans - grassland" (Nahrungsgebiete für Gänse und Schwäne)
3.1 focus species	Mainly Barnacle Goose, Greylag Goose, Whooper Swan
3.2 size of areas	16,1 ha
3.3 number of farmers involved	3 farmers with 9 areas
3.4 time period of contracts	5 years
3.5 period of year	All year round
3.6 payments & conditions for payments	85,- – 125,- €/ha/y use as permanent grassland; 01.04. - 15.05.: no rolling, or other soil treatment and no organic fertilisation; no use of plant protection agents; hayfields: mowing after 16.06. pastures used for grazing ("Weide") or pastures used for mowing with subsequent grazing ("Mähweide"): 01.04.-15.06.: 1-4 animals/ha; 16.06.-15.10. no restriction of number; horses: not earlier than 16.07.; sheep: 16.10.-31.03. no restriction of number. Pasture only used for grazing: 01.04.-15.10. no restriction of number; 16.10.-31.03. sheep: without restriction of number (1 animal=1 cattle=1 horse=3 sheep)
3.7 scaring methods including in Natura 2000	No scaring, toleration of Geese, Swans and Ducks;
3.8 hunting	regular hunting allowed

3b. Measures	Agro-environmental scheme "resting areas for migratory bird species – arable fields"
3.1 focus species	Barnacle Goose, Greylag Goose, Whooper Swan
3.2 size of areas	1096 ha
3.3 number of farmers involved	29 farmers with 161 areas
3.4 time period of contracts	5 years
3.5 period of year	All year round
3.6 payments & conditions for payments	205,- €/ha/y winter rape/winter grain (sowing not later than 15.09./01.10.); until 31.03.: no soil treatment;

	until 31.03.: no treatment with Roundup or other herbicides and no organic/mineral fertilisation allowed; after 01.04-31.08.: no restrictions
3.7 scaring methods including in Natura 2000 sites	01.09.-31.03.: No scaring, toleration of Geese, Swans and Ducks;
3.8 hunting	regular hunting allowed

3c. Measures	Agro-environmental scheme "pasture management on lowland grassland" ("Weide-Wirtschaft Marsch")
3.1 focus species	Barnacle Goose, Greylag Goose, White-fronted Goose
3.2 size of areas	4077 ha
3.3 number of farmers involved	269 farmers with 1517 areas
3.4 time period of contracts	5 years
3.5 period of year	All year round
3.6 payments & conditions for payments	290,- to 365,- €/ha/y extensively used permanent grassland; no drainage; 01.04.-20.06.: no rolling; no herbicides; no mineral fertilisation; 01.04.-20.06.: no organic fertilisation; permanent grazing: after 01.04. up to 4 animals/ha, 16.07.-15.12. no restriction of number, horses: not earlier than 16.07.; pastures used for mowing with subsequent grazing "Mähweide": mowing after 21.06., subsequent grazing with up to 4 animals until 15.12., horses: not earlier than 16.07.; 16.12.-31.03.: sheep: without restriction of number. (1 animal=1 cattle=1 horse=3 sheep) creation of biotopes (shallow pools etc.) is mandatory
3.7 scaring methods including in Natura 2000	No scaring, toleration of Geese, Swans and Ducks;
3.8 hunting	regular hunting allowed

3d. Measures	Agro-environmental scheme "pasture-landscape lowland grassland" ("Weide-Landschaft Marsch")
3.1 focus species	Barnacle Goose, Greylag Goose, White-fronted Goose
3.2 size of areas	3416 ha
3.3 number of farmers involved	72 farmers with 1325 areas
3.4 time period of contracts	5 years

3.5 period of year	All year round
3.6 payments & conditions for payments	<p>90,- to 450 €/ha/y all grassland of a given farm must be included; permanent grassland; no herbicides; no drainage; creation of biotopes (shallow pools etc.) is mandatory "green" areas: filling in of ditches; 01.04.-15.04.: no rolling, no organic fertilization "yellow" areas: blocking of ditches; 01.04.-20.06.: no rolling, no soil treatment; no mineral fertilization; 01.04.-20.06.: no organic fertilizing; after 21.06.: mowing (one cut); 01.04.-15.07. grazing with 1-4 animals/ha 16.07.-15.12. grazing without restriction of number; 16.12.-31.03. sheep: without restriction of number; horses: not earlier than 16.07.; "red" areas: reduction of drainage to create wet grassland on 10% of the areas; 01.04.-20.06.: no rolling, no soil treatment; no fertilisation; no mowing; 01.04.-15.11. grazing with 1-4 animals/ha 15.10.-31.10. sheep: without restriction of number; no horses</p>
3.7 scaring methods including in Natura 2000	No scaring, toleration of Geese, Swans and Ducks;
3.8 hunting	regular hunting allowed

3e. Measures	Agro-environmental scheme "permanent pasture" ("Dauerweide")
3.1 focus species	Barnacle Goose, Greylag Goose, White-fronted Goose
3.2 size of areas	2308 ha
3.3 number of farmers involved	134 farmers with 713 areas
3.4 time period of contracts	5 years
3.5 period of year	All year round
3.6 payments & conditions for payments	<p>60,- to 80 €/ha/y use of the permanent grassland for different kinds of grazing; cattle, mixed grazing of horses and sheep; grazing period: usually 01.05.-30.09.; no mowing;</p>

	alternative 1: after 01.04.: no rolling, alternative 2: rolling possible
3.7 scaring methods including in Natura 2000 sites	16.03.-31. 05: No scaring, toleration of Geese, Swans and Ducks;
3.8 hunting	regular hunting allowed

3f. Measures	"Halligprogramm"
3.1 focus species	Brent Goose
3.2 size of areas	Halligen, ca. 1750 ha
3.3 number of farmers involved	Ca. 45
3.4 time period of contracts	5 – 7 years
3.5 period of year	All year round
3.6 payments & conditions for payments	40,- to 280,- €/ha/y extensive use of the salt marshes; no mineral N-fertilizer; no herbicides; no rolling; low density of cattle and sheep (0,4-1,7 animals/ha); tolerance of feeding Brent Geese
3.7 scaring methods including in Natura 2000 sites	No scaring
3.8 hunting	No hunting

3g. Measures	Goose field-pool ("Gänseflächenpool")
3.1 focus species	Barnacle Goose
3.2 size of areas	81 ha (2010)
3.3 number of farmers involved	9 shepherds (2010) Dithmarschen
3.4 time period of contracts	1 year
3.5 period of year	Spring
3.6 payments & conditions for payments	depending on intensity of geese damage, shepherds can use improved areas in the hinterland free of charge for grazing or hay making
3.7 scaring methods including in Natura 2000 sites	no
3.8 hunting	no

3h. Measures	Reduction of lease payment ("Pachtnachlass")
3.1 focus species	Barnacle Goose
3.2 size of areas	
3.3 number of farmers involved	10 shepherds (2010) Dithmarschen
3.4 time period of contracts	1 year
3.5 period of year	All year round
3.6 payments & conditions for payments	depending on intensity of geese damage, lease fees for sheep-grazing of dikes (regular payment 51,13 €/ha/y) and saltmarshes (regular payment 25,26 €/ha/y) are reduced
3.7 scaring methods including in Natura 2000 sites	
3.8 hunting	

3i. Measures	Shooting to scare
3.1 focus species	Barnacle Goose
3.2 size of areas	Counties of Pinneberg, Steinburg, Dithmarschen and Nordfriesland
3.3 number of farmers involved	Not known
3.4 time period of contracts	Not known
3.5 period of year	01.10.-15.01.
3.6 payments & conditions for payments	
3.7 scaring methods including in Natura 2000	Not known
3.8 hunting	Outside of SPA; only to prevent damages from susceptible arable fields or grassland; the necessity of shooting to prevent substantial damages on grassland has to be proven by an authorised expert

3j. Measures	Shooting to scare
3.1 focus species	Graylag Goose, Canadian Goose
3.2 size of areas	
3.3 number of farmers involved	
3.4 time period of contracts	
3.5 period of year	Outside the regular hunting season 01.09.-31.10. (Greytag), 01.08.-31.10. (Canadian Goose)
3.6 payments & conditions for payments	
3.7 scaring methods including in Natura 2000 sites	
3.8 hunting	only to prevent damage on susceptible arable fields or grassland;

3k. Measures	Shooting according to § 27 federal hunting law
3.1 focus species	Graylag Goose, to a lesser amount also White fronted Goose, Bean Goose and Brent Goose
3.2 size of areas	Outside of national park but inside SPA (only if no disturbance of meadows with breeding birds occurs)
3.3 number of farmers involved	
3.4 time period of contracts	
3.5 period of year	Outside of the regular hunting season
3.6 payments & conditions for payments	
3.7 scaring methods including in Natura 2000 sites	
3.8 hunting	Shooting only by permission of the local county hunting authority