


# Wadden Sea Flyway Initiative:

## linking the Wadden Sea World Heritage Site with tropical wetlands and the Arctic tundra

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# Contents



photo: **Peter de Boer**


North America
Arctic
Asia
Western Europe
Wadden Sea
South America
Banc d'Arguin
West Africa
Bijagòs
5.000 KM
Africa
Southern Africa
10.000 KM
Breeding
Staging and wintering
> 100.000 birds
>1.000.000 birds

# 1 Introduction

Every year, millions of waterbirds visit the Wadden Sea between Esbjerg in Denmark and Den Helder in The Netherlands. The vast majority of them are migratory birds originating from the Arctic tundra between Northern Canada in the west and Central Siberia in the east. Many of these birds use the Wadden Sea during spring and autumn to replenish their body reserves, others stay to winter. They are accompanied by birds breeding in more temperate regions like the Baltic, but also by coastal breeding birds that gather to breed in the Wadden Sea. Together they constitute the East Atlantic Flyway, which connects the breeding areas with coastal wetlands all along the Atlantic coast from Europe down to southern Africa (Figure 1). The wetlands in Africa also support a range of African wetland birds, which gain the company of migrants during the northern winter.

The huge flocks of migratory birds in the Wadden Sea and their phenomenal travel schedules to areas far and wide are a fascinating experience and admired by many people. They represent one of the most important intrinsic values of the Wadden Sea and make the area a hotspot for global biodiversity. However, the global journeys of migratory birds also implicate that the Wadden Sea is an extremely important stepping stone within the flyway. With the designation of the Wadden Sea as a UNESCO World Heritage Site in 2009, the World Heritage committee therefore requested the Trilateral Wadden Sea Cooperation to seek and strengthen the collaboration with state parties along the flyway, in order to ensure the global importance of the Wadden Sea and achieve a sustainable future for the East Atlantic Flyway as a whole.

For this reason the Wadden Sea Flyway Initiative (WSFI) was established. Within this framework, the trilateral partners The Netherlands, Germany and Denmark work together with global partners like BirdLife International, Wetlands International, the African Eurasian Migratory Waterbird Agreement (AEWA), the Conservation of Arctic Flora and Fauna (CAFF) and Ramsar, as well as many regional and local partners. Part of the initiative deals with a coordinated international monitoring programme all along the flyway, focusing especially on bird abundance and environmental pressures. Another part of WSFI involves capacity-building in African wetlands in order to link local communities with wetland conservation.

The Wadden Sea countries have decades of experience with wetland management, monitoring and research, carried out through frameworks such as the Trilateral Monitoring and Assessment Programme (TMAP). These experiences facilitate the exchange of knowledge and skills with countries where such activities are as yet less well developed. They provide valuable input for capacity-building programmes and finally will provide a sound basis for prioritising protection of sites used by Wadden Sea birds in the entire East Atlantic Flyway.

**Figure 1.** Overview of the East Atlantic Flyway, covering a distance of 10,000 km, from the Arctic tundra to wetlands along the Atlantic coast of Africa.

photo: **Tim Dodman**


photo: **Tim Dodman**

photo: **Programma Rijke Waddenzee**

photo: **Harvey van Diek**

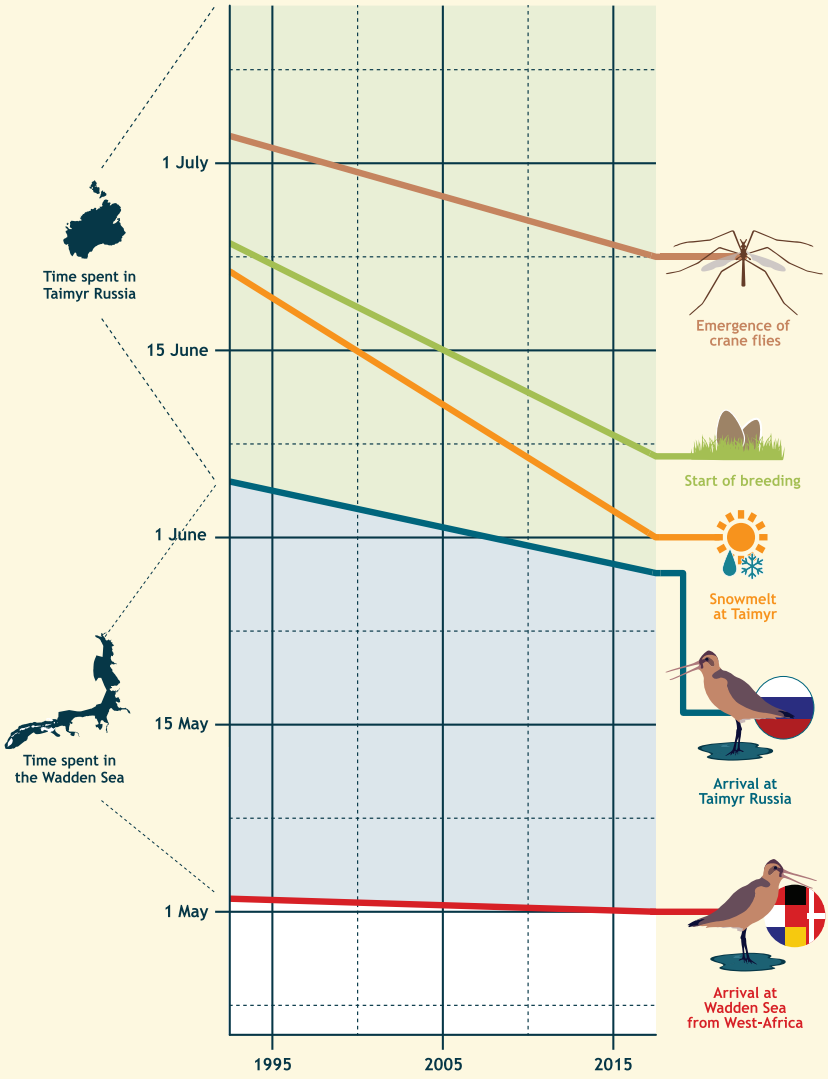
# 2 Wetlands in a changing world

Most migratory bird species which occur in the Wadden Sea are dependent on intact wetlands at all stages of their annual cycle. However, many wetlands within the East Atlantic Flyway are a shared resource not only used by migratory and breeding waterbirds but also by people. Several coastal regions are characterised by growing urban agglomerations, various industries and numerous farming and fishing activities. As such, the coastal flyway regions provide important ecosystem services to human societies, like food provision, flooding prevention, renewable energies and sports and leisure opportunities. In many wetland areas, such ecosystem services are subject to specific regulations, issued by national park authorities, site protection agencies and national or regional administrative bodies, in order to achieve a sustainable co-existence between people and wildlife. However, in a flyway perspective there are also many key sites which still lack (implementation of) active conservation measures or where coordination among the responsible authorities can be improved.

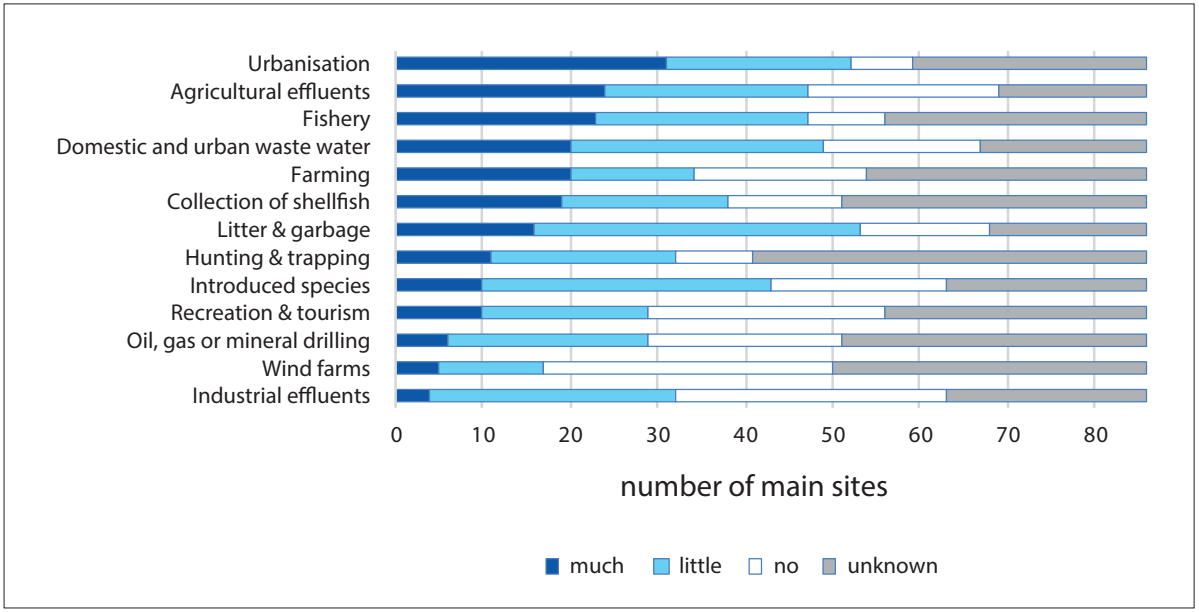
Migratory waterbirds rely on specific wetland habitats. They must cope with various environmental pressures acting at local and global scale. Especially long distance migrants have to deal with global warming and subsequent changes in environmental conditions during important parts of their annual life cycle. As climate change is most pronounced in the Arctic breeding regions, their travel schedules, which have evolved as a fine-tuned system over time, are currently under pressure (see Figure 2). Local conditions en route may enable the birds to respond to such changes, but if not, the fitness of the birds may be affected and populations start to decrease as a result.

Local environmental pressures may affect bird abundance in many wetlands along the flyway, either during the breeding season or during migration. Today, details on such pressures are collected during total bird counts in Europe and Africa during the mid-winter period. During the last survey in 2017 farming and fishing were among the most common sources of human activity reported in all surveyed wetlands. Key identified environmental pressures likely to affect the state of wetlands and wetland birds included urbanisation, industrial and agricultural pollution and fisheries (Figure 3). These do not only operate within wetland habitat, e.g. in river deltas and coastal lagoons, but also appear in areas directly bordering (protected) wetland sites, influencing the site itself e.g. by nutrient input. Especially in Europe, much wetland habitat is surrounded by intensively managed farmland, often at the edge of protected areas. Here, agricultural and pollution issues were among the most frequently reported, whilst in West Africa fishing activities (shellfish collection and fisheries), pollution and urbanisation characterise many coastal wetland areas.

◂ Many wetlands in the East Atlantic Flyway are a shared resource used by birds and people. Various sources of human activities may cause environmental pressures to the birds, either by affecting habitat quality or by causing direct disturbance.




▲ **Figure 2.** Long distance migrants like Red Knot and Bar-tailed Godwit have a tight-fitting travel schedule between their West African wintering sites and their Arctic breeding grounds. Siberian-breeding Bar-tailed Godwits arrive in the Wadden Sea around 1 May, after a nearly four days non-stop flight from West Africa. They need to refuel their body reserves in the Wadden Sea, in order to make the next jump to their breeding areas on Taimyr in Russia. However, their stay in the Wadden Sea has shortened over time, as a response to earlier snowmelt and earlier food availability on the tundra. This has forced the birds to start breeding earlier and leave the Wadden Sea earlier. Hence, this puts the refuelling time in the Wadden Sea under pressure, as the birds have less time to build up sufficient reserves, which in turn affects their survival probabilities, especially when food stocks are low. This tight but now dynamic travel scheme could only be unravelled by using long-term datasets covering decades of observations (source: Rakhimberdiev and others 2018, Nature Communications).




▲ **Figure 3.** Overview of environmental pressures recorded at the most important wetland sites during the East Atlantic Flyway bird survey in 2017. When repeated in time, developments in pressures recorded may hint potential problems for birds, even when the precise impact of the pressures is not always fully understood yet (source: East Atlantic Flyway Assessment 2017).

photo: Peter de Boer





photo: Hans Schekkerman

# 3 Monitoring along the East Atlantic Flyway

Waterbirds in wetlands are usually counted in a standardised way around high tide, when they concentrate on large roosts and are more easily counted than the dispersed flocks on the intertidal mudflats during low tide. Whilst this is relatively easy in open wetland habitat, mangrove sites like the Bijagós Archipelago in Guinea-Bissau pose a real challenge. There sampling of densities during low water and extrapolation according to total available foraging habitat is the only way to estimate total numbers.

The Wadden Sea Flyway Initiative also involves transfer of knowledge and training of local parties to enhance wetland conservation and bird monitoring.

Besides their strong intrinsic value, birds are considered good ecological indicators for the status of wetland areas, as they have a top position in food webs and their abundance is relatively easy to monitor. Monitoring and research activities are thus essential to assess the quality of wetlands and follow the fate of bird populations using the East Atlantic Flyway. They describe their status and explore the causes and backgrounds of population changes and assess the potential impact of environmental pressures. As a result, pressing issues are revealed and can help to prioritise conservation measures.

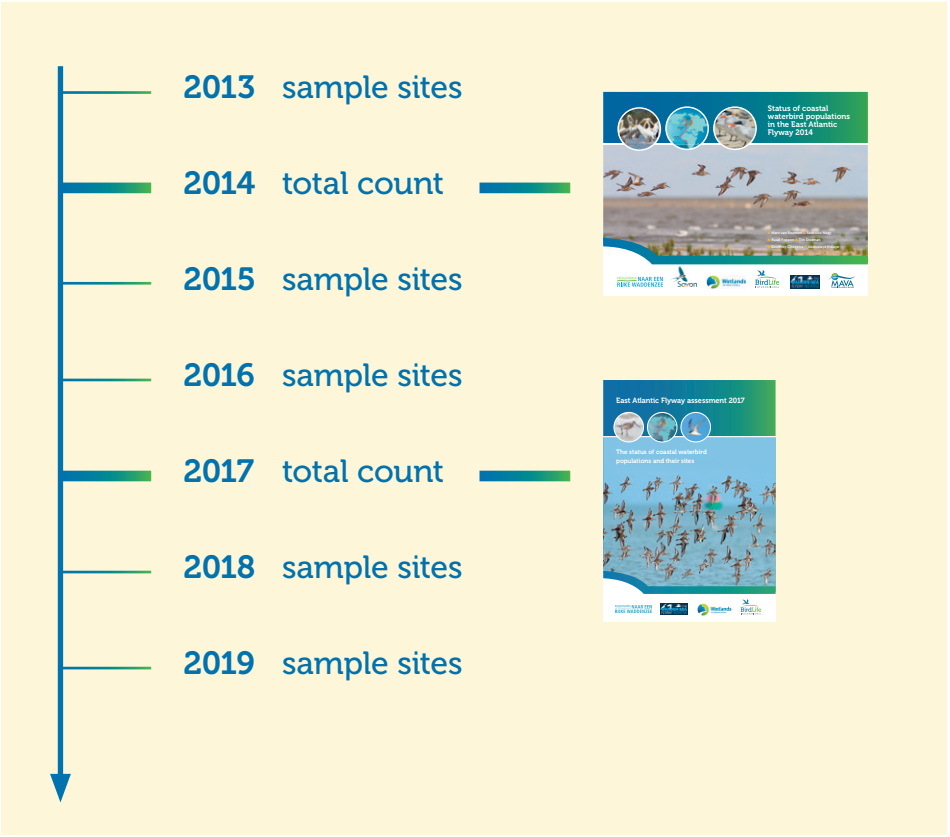
Monitoring of numbers and distribution of waterbirds has a long tradition, going back to the establishment of the International Waterbird Census (IWC) by Wetlands International in the 1960s. In the Wadden Sea the TMAP has been operating for nearly 30 years now. Such long-term datasets are essential to provide a sound context for the data collected at present. In addition, the Important Bird and Biodiversity programme of BirdLife International has promoted the monitoring of environmental pressures.

The WSFI builds upon these existing frame-works and long-term datasets. Monitoring activities and capacity-building projects carried out so far have added the flyway perspective to Wadden Sea monitoring and support local monitoring incentives in order to improve survey coverage. For many years, the (changes in) total population size of several waterbird species using the East Atlantic Flyway was poorly known as only a part of their range was covered. Expansion of surveys in African wetlands and other areas has now improved the knowledge on the status of many of these species and has also made it possible for the first time to determine long-term changes in their numbers, and compare those with changes in abundance in the Wadden Sea (see chapter 4 for examples). Furthermore, several research activities are going on in which in-depth knowledge of demographic drivers and interactions between birds and food resources are collected (see example in Figure 2).

photo: Tim Dodman

The intensified monitoring along the East Atlantic Flyway started in 2013 and consists of an annual count of at least a number of sample sites in each country, complemented by a comprehensive total count of all key sites once every three years to assess total population size and distribution (Figure 4).

Since 2012, the WSFI is also engaged in capacity-building for enhancing conservation and sustainable management of wetlands, participatory awareness and community-based site activities at local and regional levels in 12 African countries.




▲ **Figure 4.** Survey schedule for the East Atlantic Flyway monitoring since 2013. Data delivered by WSFI not only provide input for the tri-annual flyway assessments, but also serve the Quality Status Reports of the Trilateral Wadden Sea Cooperation and other international frameworks like the International Waterbird Census (IWC) from Wetlands International, the Conservation Status Review from AEWA and the national reports for the EU Bird Directive.

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# Summary of key findings of the East Atlantic Flyway Assessment 2017 in comparison to the Wadden Sea

The total count of the East Atlantic Flyway in January 2017 was carried out in 33 countries - 11 in Europe and 22 in Africa (Figure 5). A large network of national and regional organisers coordinated more than 1500 observers. When looking at trends in numbers retrieved from all available data, the majority of waterbird populations show a favourable trend, either increasing or stable (Figure 6). Moderate declines account for 23% of all populations. For short-term trends over the past 10 years, the situation is more uncertain, as short-term fluctuations confound a reliable and significant trend estimate. However, species showing positive long-term trends have also tended to increase over the past 10 years, and many species with a long-term decreasing trend further went down in recent years.

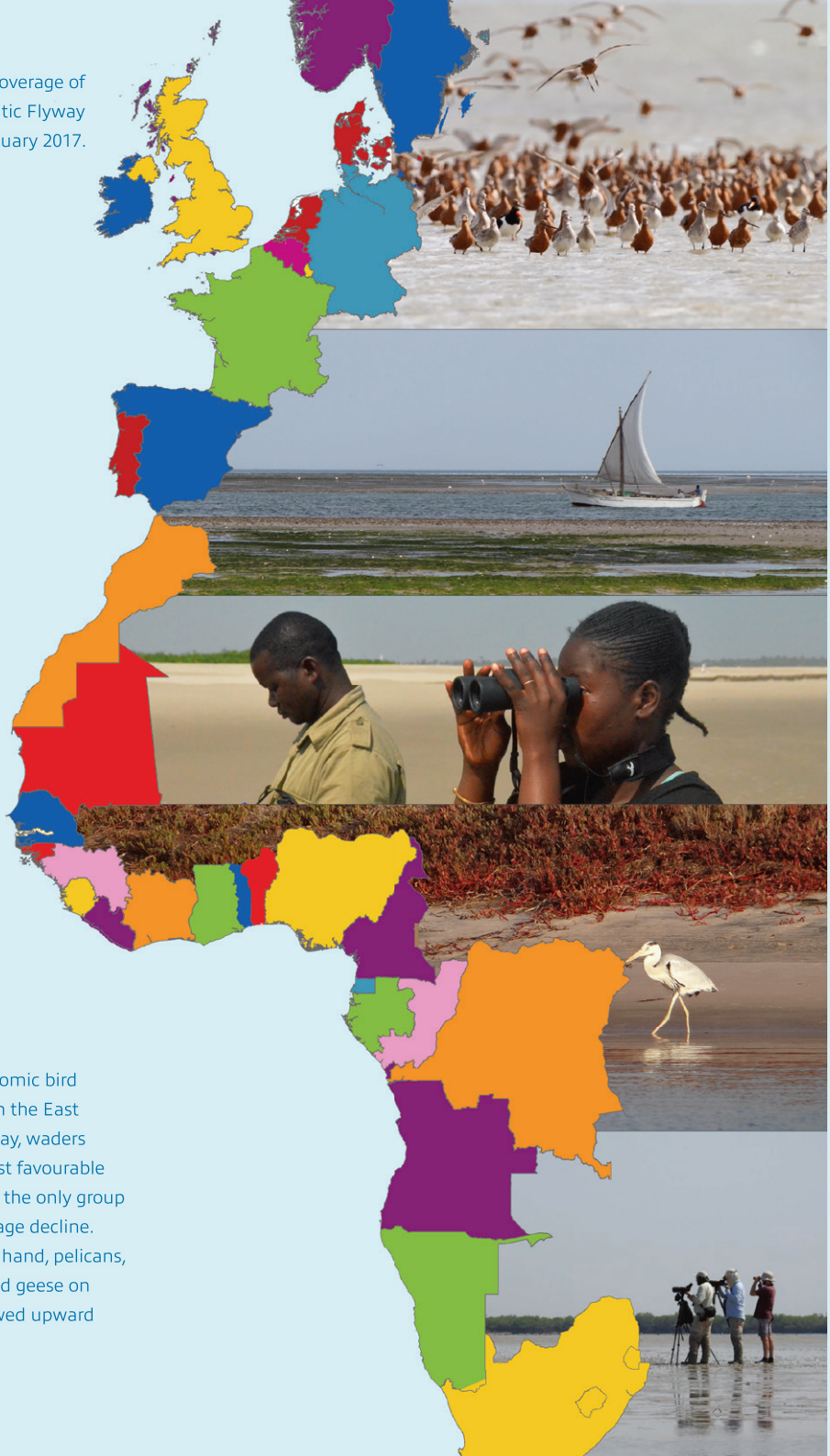
Species in decline share a number of similar characteristics: they use intertidal flats for feeding, depend on benthic food and breed in the Arctic. Waders breeding in the Siberian Arctic show the least favourable trends, whilst they are also highly susceptible to issues like climate change, interplaying with their tight migration strategies (see example in Figure 2).

photo: **Peter de Boer**

▸ Coordinated high tide roost counts need a careful preparation.

photo: **Arnold Meijer**

**Figure 5.** Coverage of the East Atlantic Flyway count in January 2017.



Of all taxonomic bird groups within the East Atlantic Flyway, waders show the least favourable trends, being the only group with an average decline. On the other hand, pelicans, flamingos and geese on average showed upward trends.

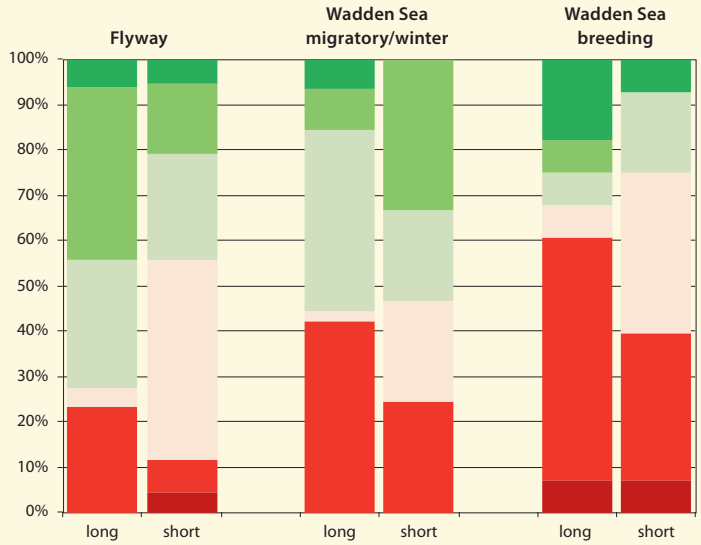



**Figure 6.** Summary of the fate of bird populations in the East Atlantic Flyway, compared with trends for migratory birds and breeding birds in the Wadden Sea. Trends are shown for the long-term (long, i.e. since the start of the monitoring series) and short-term (short, last 10 years). Shown is the proportion of species in each category (source: East Atlantic Flyway Assessment 2017 and Wadden Sea Quality Status Report 2017).



The results of the overall flyway assessment put a global perspective to the trends in numbers recorded in the Wadden Sea, as retrieved by the TMAP. For breeding birds, the latest Quality Status Report showed that out of 29 species for which trends could be assessed, 17 (59%) have gone down in numbers since 1991 (Figure 6), some even with an accelerating rate of decline over the last 10 years. Migratory birds fare better, but still include 19 declining populations (42%) (Figure 6).

From the overall comparison of trends between the flyway and the Wadden Sea, breeding birds in the Wadden Sea clearly stand out as a group with many downward trends. For several single species, the flyway assessment points at contrasting developments. For instance, negative trends in breeding Pied Avocet and Common Ringed Plover (*hiaticula* subpopulation) disagree with overall positive trends at flyway level, implicating less favourable breeding conditions in the Wadden Sea.

At the same time also a number of species is doing worse in the Wadden Sea during migration or wintering than at the flyway level, such as Eurasian Wigeon, Eurasian Oystercatcher and Dunlin. In contrast, Northern

photo: Sylvan Puijman

◂ Pied Avocet shows one of the most pronounced differences between trends in numbers at flyway level and trends in numbers in the Wadden Sea, both for breeding and migratory birds. TMAP-data show that breeding birds at many sites suffer from the lack of breeding success.

photo: **Arnold Meijer**



▲ Eurasian Oystercatcher is one of the most abundant birds in the Wadden Sea. It is among the species for which both breeding and wintering numbers in the Wadden Sea have declined in past decades. The species has declined at the flyway level as well, but at a lower rate than in the Wadden Sea.

▶ Northern Pintail is one of the species for which numbers in the Wadden Sea show a distinct increase compared to numbers at the flyway level. This trend may have been triggered by the overall warmer winters, stimulating the birds to stay at more northern latitudes.

Pintail, Grey Plover, the *canutus* population of Red Knot, the *taymyrensis* population of Bar-tailed Godwit and Eurasian Curlew show more positive trends in the Wadden Sea than at the flyway level.

Compared to earlier assessments, trends among benthic feeders seem to have improved in the Wadden Sea, with fewer species showing pronounced downward trends recently. The *islandica* population of Red Knot was in fast decline in the Wadden Sea in the 1990s but now shows signs of recovery. The *canutus* population of Red Knot is occurring in stable numbers in the Wadden Sea, but declining at the flyway level.

photo: **Glenn Bartley / Agami**

photo: **Peter de Boer**

# 5 From monitoring to conservation

Together with the Banc d'Arguin in Mauritania, the Bijagós Archipelago in Guinea-Bissau is one of the key sites for wintering migratory waterbirds in West Africa. The area has been proposed for designation as a World Heritage Site and receives support from a range of partners, including the MAVA Foundation AMBI and the WSFI, to work towards achieving this status.

**VISION OF THE WADDEN SEA FLYWAY INITIATIVE:**

Migratory birds find lasting refuge along the East Atlantic Flyway from northern breeding areas to their key Wadden Sea stopover and to the African coastline, and inspire and connect people for future generations.

Sharing and transferring knowledge is one of the key activities of the WSFI to strengthen local monitoring and conservation work.

Evidence-based conservation benefits from the input from well-developed long-term monitoring schemes and outcomes of dedicated research projects. Therefore, these instruments are considered an important basis in achieving WSFI goals and evaluating the targets of the Wadden Sea Cooperation. But in addition, the WSFI has also embarked on the call from the World Heritage committee to seek a more general approach in wetland bird conservation, by mutually supporting sustainable and long-term conservation of the East Atlantic Flyway and connecting migratory waterbirds to people. This is addressed in numerous projects focusing on awareness-raising for wetland conservation and capacity-building for local management and monitoring activities.

The East Atlantic Flyway Assessments in 2014 and 2017 revealed that among all migratory waterbirds, waders feeding on intertidal mudflats and relying on benthic food resources showed the least favourable

photo: Menno Hornman

trends in numbers. Those species that undertake long distance flights between their African wintering sites and Arctic breeding areas in Siberia, and stopover in the Wadden Sea seem to be under extra pressure from the rapid changes in the Arctic due to climate change. These species benefit from high quality and undisturbed feeding habitats and suitable high tide roosts, enabling them to buffer the climate change effects. However, there may be direct conflicts with human use of their feeding areas and disturbance on high tide roost by e.g. leisure and sport activities.

Another group of birds for which the flyway assessment points to an unfavourable status is those species breeding in the Wadden Sea. The salt marshes, coastal wetlands, dune areas and beaches in the area provide specific habitats for coastal breeding birds. However, many of these birds suffer from poor breeding success. Common causes for breeding failures are high predation risk, losses due to flooding by summer storms and issues with food provisioning. Beach-breeding birds locally suffer from leisure activities. Most of the coastal breeding birds are used to periodic losses as a result of the dynamic conditions in which they usually settle to breed. However, species like Eurasian Oystercatcher, Pied Avocet and Arctic Tern have experienced poor reproduction rates over a long series of years and, as a consequence, have continued to decrease.

This has prompted a number of activities within the trilateral cooperation. Besides active management carried out for beach-breeding species, e.g. on the Wadden



photo: Harvey van Diek

When occurring at the wrong spot and at the wrong time, sports activities like kite surfing may disturb large flocks of roosting birds at their high tide roosts.

For the trilateral 'Breeding birds in trouble' project various measures are undertaken or planned to improve breeding habitat for coastal breeding birds, as shown here for a breeding site directly behind the seawall in Groningen, The Netherlands.

photo: Kees Koffijberg

Sea Islands, predation issues have been addressed in the framework of the 'Breeding birds in trouble' project and the activities in the Dutch Wadden Sea by the Programme Towards a Rich Wadden Sea. These initiatives intend to improve habitat quality for breeding birds, or provide new breeding opportunities, thereby making habitats less attractive, or less accessible for ground predators. Regarding predation risk, it should be noted that the Wadden Sea Islands are an important refuge for breeding birds, as they are naturally free of most of the ground predators. Measures to improve habitat quality for coastal waders are also undertaken in a number of EU LIFE projects, e.g. LIFE Limosa and Wiesenvogel LIFE in Germany. Many of these projects have only started recently, and the ongoing monitoring activities will reveal how bird populations will respond.

In African wetlands, international conventions like AEWA and Ramsar are important frameworks to improve wetland and wetland bird conservation. The WSFI therefore works closely together with these organisations in order to yield as much synergies as possible. In this context, transfer of knowledge and skills is an important way forward to achieve sustainable wetland management. Only by improving wetland conservation at flyway level, birds using the Wadden Sea will benefit as they can rely on the entire chain of wetlands during their annual cycle.

# Further reading

**Wadden Sea Flyway Initiative**
www.waddensea-secretariat.org/flyway

**East Atlantic Flyway Assessment 2017**
www.waddensea-worldheritage.org/resources/east-atlantic-flyway-assessment-2017

**Wadden Sea Quality Status Report 2017**
https://qsr.waddensea-worldheritage.org/

**Glossary:**

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| AEWA: | Agreement on the Conservation of African-Eurasian Migratory Waterbirds |
| AMBI: | Arctic Migratory Birds Initiative |
| CAFF: | Conservation of Arctic Flora and Fauna |
| Ramsar: | Ramsar Convention on Wetlands |
| TMAP: | Trilateral Monitoring and Assessment Programme |
| WSFI: | Wadden Sea Flyway Initiative |



The total flyway count of 2017 was coordinated by Sovon Vogelonderzoek Nederland, Wetlands International and BirdLife International, commissioned by Programme towards a Rich Wadden Sea (PRW). This monitoring is part of The Wadden Sea Flyway Initiative (WSFI) and made possible by the Dutch Ministry for Agriculture, Nature and Food Quality, Life IP Flyway, Vogelbescherming Nederland, The World Wide Fund (WWF), Wetland Bird Survey (WeBS, UK), Common Wadden Sea Secretariat (CWSS), MAVA foundation, Nationalparks Vadehavet (Denmark), Niedersachsen and Schleswig Holstein (Germany).

The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supported the capacity- building part of the WSFI with almost 25 local and regional projects in 10 African countries.


United Nations
Educational, Scientific and
Cultural Organization
The Wadden Sea
World Heritage Site
since 2009


WADDEN SEA
WORLD HERITAGE


THE
WADDEN SEA
FLYWAY INITIATIVE


Common
Wadden Sea
Secretariat


Ministerie van Landbouw,
Natuur en Voedselkwaliteit


Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety


LIFE IP
Deltanatuur