wings over wetlands

The UNEP-GEF African-Eurasian Flyways Project

THE CRITICAL SITE NETWORK:

Conservation of Internationally Important Sites for Waterbirds in the African-Eurasian Waterbird Agreement Area

gef UNEP WETLANDS INTERNATIONAL BirdLife INTERNATIONAL AEWA BfN UNOPS Ramsar UNEP WCMC

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ISBN:
978-90-81741613

Reproduction:

Produced by:

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Glossary

AEWA	African-Eurasian Migratory Waterbird Agreement
CSN	Critical Site Network
IBA	Important Bird Area
GEF	The Global Environment Facility
IUCN	The World Conservation Union or International Union for the Conservation of Nature
IWC	International Waterbird Census
RLI	Red List Index
RSIS	Ramsar Sites Information Service
SSG	Site Support Group
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WBDB	World Bird Database
WDPA	World Database on Protected Areas
WOW	Wings Over Wetlands project

Contents

INTRODUCTION - 07

CRITICAL SITE NETWORKS FOR WATERBIRDS IN THE AEWA REGION - 15

THREATS TO THE CRITICAL SITE NETWORK - 20

CONSERVATION SOLUTIONS - 22

ENDNOTES & REFERENCES - 34

Suggested citation:
Wings Over Wetlands UNEP-GEF African-Eurasian Flyways Project. 2011. The Critical Site Network: Conservation of Internationally Important Sites for Waterbirds in the African-Eurasian Waterbird Agreement area. Wetlands International, Ede, the Netherlands and BirdLife International, Cambridge, UK.

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Publisher:

Cover photo:
Flock of flamingos and other waterbirds in a tranquil lagoon

Additional photography:
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Acknowledgements:
We would like to sincerely thank all the many people who have volunteered their time and contributed to our knowledge of waterbirds and their sites by submitting their monitoring data to Wetlands International and BirdLife International over the years.

We would also like to thank everyone who had input into developing the methods for Critical Site identification and all those who helped to shape the development of the CSN Tool by commenting on earlier versions. Thanks to Dr David Kleijn of Alterra, Center for Ecosystem Studies for allowing us to adapt and use Fig. 17 and to Phil Taylor for producing Fig. 5.

We are very grateful to all the photographers who have kindly provided us with excellent images for this publication.

1. Introduction

This publication aims to provide an overview of the Critical Sites identified for waterbirds in the African-Eurasian region through the Wings Over Wetlands (WOW) project. It highlights the importance of Critical Sites for the populations they hold, the threats facing these sites and their current protection status. Case studies illustrate different approaches to achieving effective conservation for migratory waterbirds.

WOW Steering Committee and part of the project team - © Camillo Ponziani

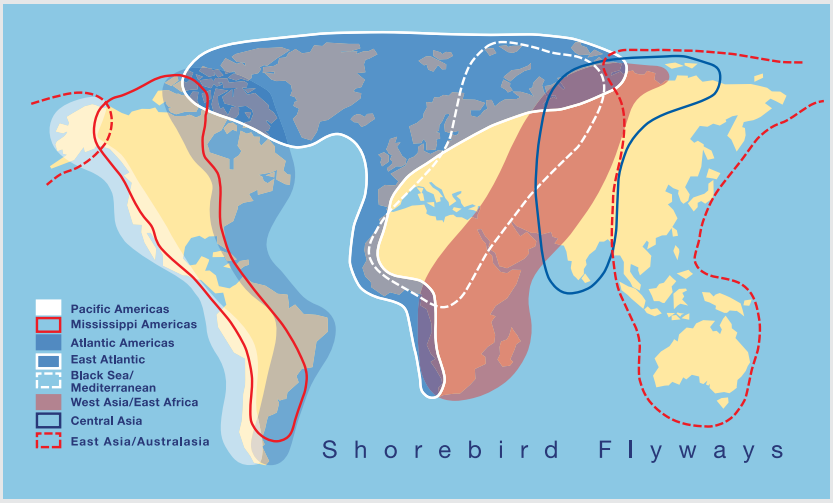
About WOW

The WOW project has been the largest international wetland and waterbird conservation initiative ever to take place in the African-Eurasian region. The project aim was to improve the conservation of migratory waterbirds by conserving the network of Critical Sites upon which they depend in the area of the African-Eurasian Migratory Waterbird Agreement (AEWA). Wings Over Wetlands has been a US$ 12 million initiative funded by The Global Environment Facility, the German Government, the United Nations Environment Programme (UNEP) AEWA Secretariat and many other donors.

The project has been a joint effort between Wetlands International, BirdLife International, UNEP-AEWA, the German Federal Agency for Nature Conservation, the Ramsar Convention on Wetlands, United Nations Office for Project Services, UNEP-World Conservation Monitoring Centre and a range of other local partners in Africa and Eurasia. The aims of WOW have been addressed through several different components aimed at: improving access to information through developing the Critical Site Network planning and management tool (CSN Tool), strengthening decision-making and technical capacity of practitioners, improving communication, enhancing the availability and exchange of information and demonstrating best practice.

The flyway approach

Waterbirds travel vast distances, crossing many countries and often entire continents during their annual migration cycles along 'flyways' that connect breeding, staging and non-breeding areas. Their life cycles illustrate the connectivity and interdependence of ecosystems across the globe. Many waterbirds are reliant upon critical wetland sites which are also vital to local people. A functioning network of such sites is key to the flyway approach and complementary local, national and international conservation action is essential to maintain healthy waterbird populations and conserve critical wetlands along these flyways.



The eight broad flyways of waders/shorebirds – © International Wader Study Group

Such an approach requires concerted management effort along the entire flyway, ensuring that Critical Sites function effectively as a network, and are managed to maintain healthy ecosystems which meet the needs of waterbird populations as well as providing key services to local people.

AEWA and the Ramsar Convention on Wetlands outline the requirements and provide guidelines for achieving effective management of flyway site networks. The CSN Tool which has been developed under the WOW project will help them meet these aims.

The Critical Site Network Tool

The CSN Tool (accessible through the WOW website: www.wingsoverwetlands.org/csntool) is one of the major outputs of the WOW project. It is a new open-access online resource to support the conservation of 294 species of waterbirds and the important sites upon which they depend in Africa and Western Eurasia. It is designed to help a range of different users (from site managers to national authorities and international organisations) to access information on waterbirds and the sites they use, and the information is analysed and presented from a flyway perspective to provide an overview essential for effective conservation management and decision making. The CSN Tool supports both AEWA and the Ramsar Convention on Wetlands. It is also relevant to the European Union's Birds Directive and the Bern Convention's Emerald Network.

Black-crowned Night Heron (Nycticorax nycticorax) - © istockphoto.com

The CSN Tool brings together information held in four databases used for international waterbird and wetland conservation:

World Bird Database (WBDB):

The WBDB is managed by BirdLife International and stores information on all of the world's bird species and the key sites identified for their conservation (Important Bird Areas - IBAs).

For more information please visit: **www.birdlife.org/datazone/home**

International Waterbird Census (IWC) Database :

The IWC Database is maintained by Wetlands International and includes over 25,000 sites of importance to waterbirds. It contains the most complete waterbird count data available in the African-Eurasian region and other flyways.

For more information please visit: **www.wetlands.org/IWC**

Ramsar Sites Information Service (RSIS):

The RSIS provides data on wetlands designated as Wetlands of International Importance under the Ramsar Convention, generally called Ramsar sites. Wetlands International manages the database for the Ramsar Convention on Wetlands.

For more information please visit: **www.wetlands.org/rsis**

World Database on Protected Areas (WDPA):

The WDPA provides the most comprehensive dataset on protected areas worldwide and is managed by UNEP-WCMC in partnership with the International Union for Conservation of Nature World Commission on Protected Areas and the World Database on Protected Areas Consortium.

For more information please visit: **www.wdpa.org**

Structure

The CSN Tool brings together a number of separate datasets in one web mapping system which is based on the ESRI ArcGIS platform. This system provides a robust and scalable architecture to deliver both spatial and non-spatial data over the web to a large number of users and also provides a rich user interface. The technology that is used is separated into the database component, the delivery of that data over the web (through web services) and the user interface itself. The database that has been used is ArcSDE running on Microsoft SQL Server 2008 and this holds all of the data that is used in the website. An ArcGIS server delivers this data over the internet and the user interface has been designed and implemented in Adobe Flash, one of the most widely used platforms for rich internet applications. One of the benefits of using this kind of architecture is that services can be integrated from other sources such as Flickr and Panoramio image services and CSN data can be delivered into other client tools like Google Earth and ArcGIS Desktop.

Trends in waterbird populations in the AEWA region

The CSN Tool provides support to conservation decision-making in the AEWA region. This supports is much-needed given the deteriorating situation for waterbirds on this flyway. The most recent AEWA conservation status report (Delany *et al.* 2008) showed that overall the trend status of waterbirds in the Agreement area worsened between 1999 and 2006. In the AEWA region as a whole, of populations covered by the Agreement with known trends, nearly twice as many showed decreasing trends as increasing trends (Fig. 1a). In the part of the Agreement Area in Asia, the situation was much worse; in 2006 55% of populations were known to be decreasing, five times as many as known to be increasing (Fig.1d).

The state of knowledge of waterbird population size is improving; in 2006 estimates were available for 98% of the 521 waterbird populations covered by the AEWA Agreement, but the quality of many of the estimates remained low and no population trend estimates were available for about one third of these populations. In general the quantity and quality of waterbird population estimates and trends is considerably higher in Europe, particularly in northern and western Europe, than in the rest of the AEWA region.

In the most recent AEWA conservation status report, families with a high proportion of their populations (50% or more) showing decreasing trends were, in descending order: penguins, boobies, shoebill, skimmers, oystercatchers, coursers & pratincoles, crakes & rails, cranes, grebes, plovers, and divers. Families with a high proportion (100% to 35%) of unknown population trends were, in descending order: thick-knees, divers, plovers, crakes & rails, coursers & pratincoles, gulls & terns and herons & egrets. Families in both categories (i.e. having a high proportion of populations with unknown trends, and a high proportion of those with known trends in decline) are perhaps most in need of baseline information and these were: divers, plovers, crakes & rails, and coursers & pratincoles.

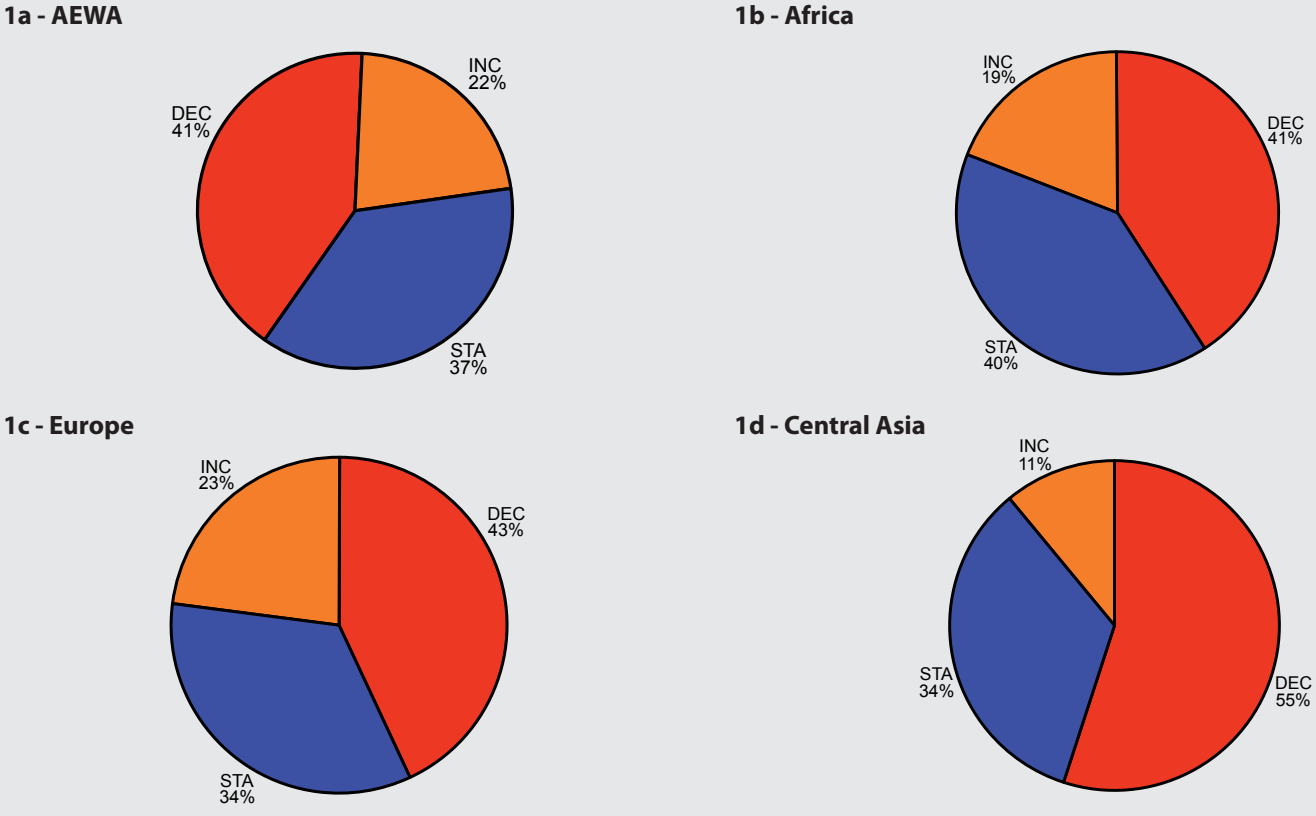


Figure. 1: Overall trend (STA =stable, INC=increasing, DEC=decreasing) for populations with known trend in: a) the AEWA region (n=364 populations), b) Africa (n=275), c) Europe (n=237), and d) Central Asia (n=115).

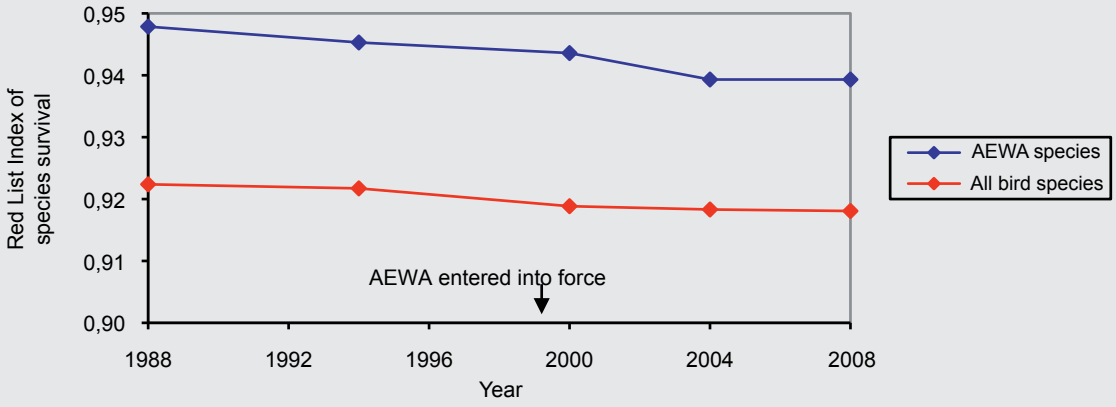


Figure. 2: Red List Index of species survival for species listed on AEWA Annex 2 in 2008 (n=234 species recognised by BirdLife and IUCN), showing the proportion of species expected to survive in the near future without additional conservation action. An RLI value of 1.0 equates to all species being categorised as Least Concern, and hence that none are expected to go extinct in the near future. An RLI value of zero indicates that all species have gone extinct. AEWA Annex 1 describes the agreement's area; Annex 2 lists the waterbird species to which the agreement applies.

Conservation status of African-Eurasian waterbirds

The most recent Red List[1] index (RLI) calculated by BirdLife for AEWA-listed species in 2008 showed that, overall, AEWA species were less threatened than all birds, perhaps not surprising given that migrants overall tend to be less threatened than non-migrants (Kirby *et al.* 2008). However the status of AEWA species had deteriorated faster (i.e. the RLI slope is steeper), indicating that this subset of migrants is being particularly impacted by threatening processes, in particular the loss and degradation of their wetland habitats. The flattening of the graph during 2004-2008 is no cause for complacency; it may partly represent an artefact of delays in knowledge and further deteriorations in the status of some AEWA species during 2004–2008 may yet be reported, driving a decline in the RLI slope for this period.

The CSN Tool includes not only the 235 migratory species listed on AEWA Annex 2 at the start of the WOW project, but also 59 other waterbird species (many of them resident or intra-African migrant species) found within the AEWA area. Of the total of 294 waterbird species covered by the CSN Tool, 38 are globally threatened and a further 18 Near Threatened according to the IUCN Red List (BirdLife International 2010). During the course of the WOW project, one WOW species was declared extinct. Alaotra Grebe *Tachybaptus rufolavatus* was restricted to a tiny area of east Madagascar. The species declined rapidly after carnivorous fish were introduced to the lakes in which it lived. This, along with the use of nylon gill-nets by fisherman which caught and drowned birds, is believed to have driven the species to extinction.

Garganey (Anas querquedula) - © Sunil Singhal

Shoebill (Balaeniceps rex) classified as Vulnerable on the IUCN Red List - © istockphoto.com

The resident Alaotra Grebe listed as extinct in 2010 - © Chris Rose

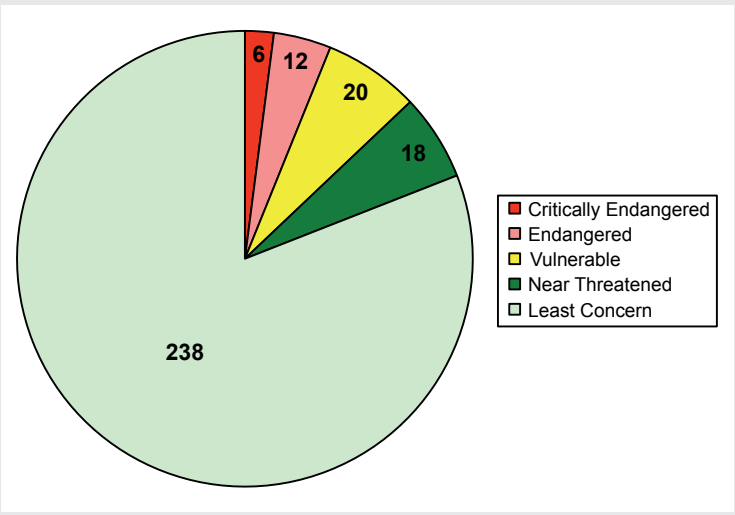


Figure. 3: Proportion of all WOW species (n=294) assigned to different IUCN Red List categories in the 2010 assessment. Labels show number of species.

The six Critically Endangered WOW species Madagascar Pochard *Aythya innotata*, Northern Bald Ibis *Geronticus eremita*, Dwarf Olive Ibis *Bostrychia bocagei*, Siberian Crane *Grus leucogeranus*, Sociable Lapwing *Vanellus gregarius* and Slender-billed Curlew *Numenius tenuirostris* could follow the Alaotra Grebe to extinction if conservation efforts are not successful.

Black Crowned-crane is undergoing rapid population decline - © M. Kuhn

Considerable conservation effort is rightly being invested in attempts to save Critically Endangered waterbird species. Early detection of declines and timely action to address the causes of declines will be key to preventing more waterbird species from reaching this perilous position. Like many other waterbird species Black Crowned-crane *Balearica pavonina* has undergone a rapid population decline that is predicted to continue into the future, primarily due to habitat loss and trapping for domestication or illegal international trade. As part of the 2010 IUCN Red List assessment, this species was moved to a higher threat category, from Near Threatened to Vulnerable. More effective conservation of the network of sites on which such species depend will play a key part in improving their status in the future.

Siberian Crane classified as Critically Endangered on the IUCN Red List - © bigstockphoto.com

Critical Site Networks for Red Knot (Calidris canutus)

Red Knots in the AEWA region belong to two subspeciifc populations – C. c. *islandica* and C. c. *canutus*. The long distance migration strategy of Red Knots means that despite travelling very long distances between Siberia and South Africa they concentrate at relatively few sites along their routes. Both populations are heavily reliant upon the Wadden Sea as a stopover site. This vast site which stretches from the coast of the Netherlands up the coast of Germany and into Denmark is one of the largest coherent areas of tidal flats in the world and qualifies as a Critical Site for at least 34 different populations of waterbird. Despite being protected under national protected area systems as well as being a Ramsar site, UNESCO World Heritage Site and Special Protection Area under the Birds Directive, the Wadden Sea is threatened by human activities. Large scale fisheries, growing tourism, military training, industrial developments, intensive farming, and the effects of climate change, are damaging this fragile ecosystem and the populations of many bird species that rely upon it are in decline (BirdLife International 2009).

Further south a very high percentage of the *canutus* population spends the non-breeding period at Banc D'Arguin in Mauritania, a Critical Site for 28 populations of waterbird and the focus of a WOW demonstration project[2] aimed at addressing threats to the site.

Red Knot, like many long distance migrants has astounding flexible physiological adaptations to its migratory life cycle. It is able to increase its heart and pectoral muscle mass and decrease its intestinal mass in readiness to depart and reverse this process once it reaches its destination.

The Critical Site Networks for the two African-Eurasian populations of Red Knot displayed in the CSN Tool.

Red Knots flock with other shorebirds - © Chris Gomersall (rspb-images.com)

Red Knots flying over water - © istockphoto.com

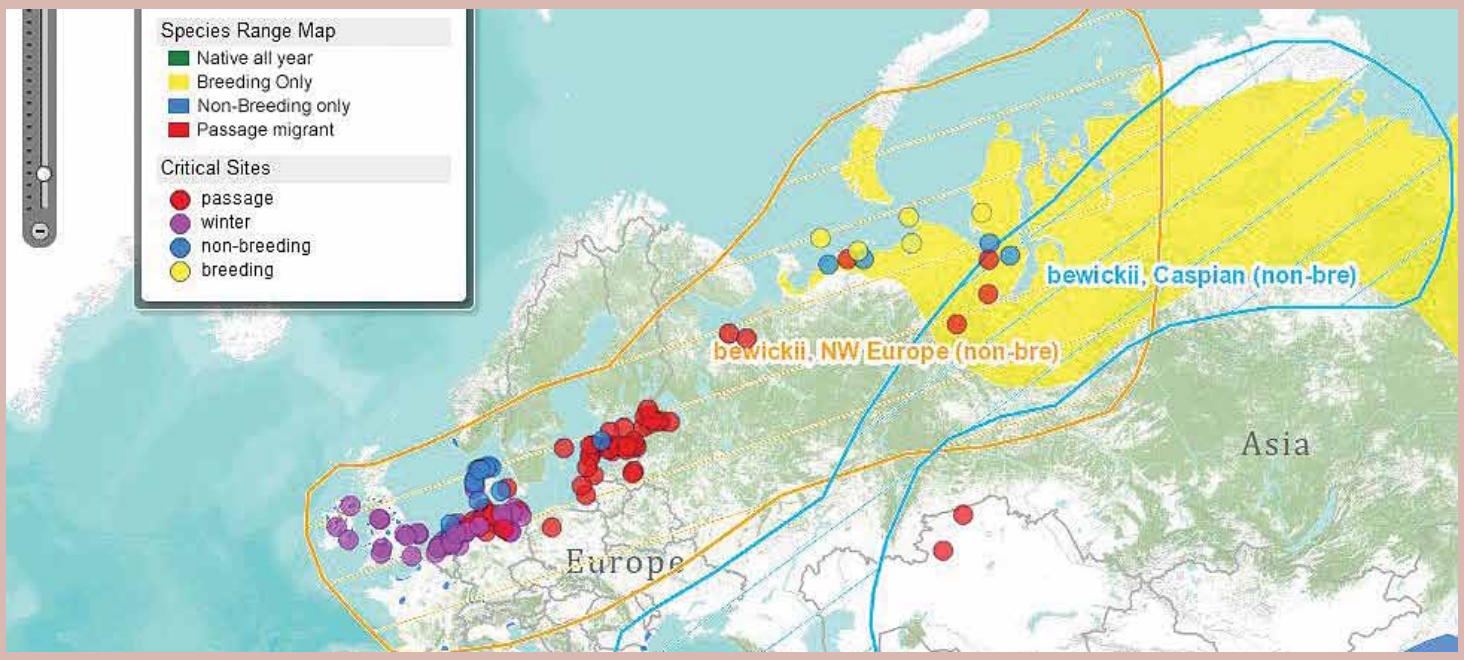
'The Long Journey' – demonstrating a practical approach to flyway conservation

The Bewick's Swan[3], *Cygnus columbianus bewickii* breeds adjacent to shallow lakes and pools on the Arctic tundra. Birds breeding in European Russia from the Kanin peninsula to the Urals mainly spend the non-breeding period in North-West Europe, particularly in the UK and the Netherlands and in smaller numbers in Belgium, Germany, Denmark, Ireland and France.

Bewick's Swan, a species in decline in North-West Europe - © istockphoto.com

Conditions are often severe at the start of the breeding season, so the survival and reproductive success of breeding birds is highly dependent on the fat reserves they can carry with them from the non breeding and stop-over sites, but such large birds cannot carry large fat reserves without jeopardising their ability to fly. Replenishing fat reserves on arrival at the breeding grounds takes a relatively long-time, but the Bewick's Swans only have a short window of opportunity to return to their breeding grounds, lay eggs, incubate them and raise offspring before the onset of the Arctic winter. Therefore, the species has evolved a migration strategy which involves individuals making only one major stop in the north-eastern part of the Baltic on southward migration, while on northward migration the birds make an additional stop at the White Sea to return to the breeding grounds in good condition.

The Bewick's Swan population wintering in North-West Europe has suffered a severe decline since the mid-1990s despite the fact that the non-breeding sites in Western Europe and the Baltic countries are well protected. At the Critical Sites Haapsalu Bay (part of Väinameri supporting 75% of the population) and the Nemunas Delta Regional Park in Lithuania (supporting 3% of the population), management activities were supported by the Wings Over Wetlands project. However, the protection of stop-over and breeding sites in Russia still needs to be improved. The Long Journey Project[4] has applied the principles of flyway conservation promoted by AEWA and the WOW project. The project combined the development of a species action plan with collaboration between managers of key sites along the flyway. It also included developing a management and action plan for a critical stopover site, the Berezovye Islands of Vyborg Bay in Russia. This was achieved with the assistance of Dutch experts in facilitating management planning, the involvement of multiple stakeholders and the establishment of good working relationships between Dutch and Russian site managers, leading to long-term collaboration and ongoing exchange of experience between them.

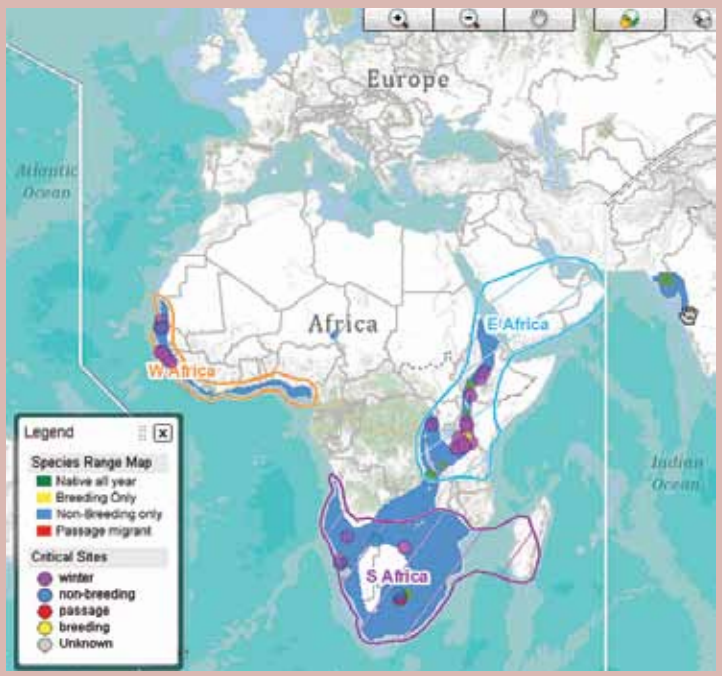


The Critical Site Networks for the two populations of Bewick's Swans displayed in the CSN Tool.

Greater White-fronted Geese (Anser albifrons) - © bigstockphoto.com

Critical Sites under threat – The Lesser Flamingo

Flocks of several hundred thousand Lesser Flamingo *Phoeniconaias minor* feeding on the alkaline-saline lakes of the Great Rift Valley in East Africa provide one of the most impressive wildlife spectacles in the world and help to support local economies through ecotourism. However despite this apparent abundance the species is classified as Near Threatened because its population is declining and it depends on very few breeding sites, which are threatened by human activity. Lake Natron in Tanzania is by far the most important breeding site for this species, as it is the only breeding site for the East African population and also represents >75% of the species' global population. Despite its importance this Critical Site recently came under renewed threat from a proposed soda ash plant and local communities, institutions, NGOs and the international community are still struggling to avert the threat. In the past when Lake Natron was unsuitable because of flooding the flamingos bred instead at Magadi Pan in Kenya, and Lake Nakuru was also used. Protection of Critical Site Networks for each population is essential to allow birds to move between sites when local environmental conditions become unfavourable. This kind of flexibility will become even more important in the face of future climate change. Protection of the Critical Sites that each population uses outside the breeding season is also very important to securing the future of the species. The CSN Tool allows decision-makers to visualise protection status of sites providing a basis for prioritising conservation action.



Critical Site Networks for the three Lesser Flamingo populations displayed in the CSN Tool.

The Flamingos of Lake Natron a site under threat - © istockphoto.com

2. Critical Site Networks for waterbirds in the AEWA region

Identifying Critical Sites

Which are the most important sites for waterbird populations in the AEWA area? This is an important question to answer if site conservation effort is to be directed appropriately and efficiently. Under the WOW project the latest available data on bird populations at sites in the AEWA region were drawn together from the databases of BirdLife International and Wetlands International and, in 2010, criteria were applied to identify Critical Sites. The methodology used was similar to that already applied in identifying Ramsar Sites and IBAs, i.e. involving the application of quantitative criteria based on the most recent available knowledge of the sizes and trends of bird populations in the area. However, dedicated CSN Criteria have been developed, derived from the relevant Ramsar and IBA criteria in order to address the project's particular focus (i.e. identification of networks of Critical Sites for populations during those stages of their annual cycles when the site-based conservation approach is effective).

A site has been identified as 'critical' if it fulfils at least one of the two CSN criteria[5]:

CSN criterion 1: The site is known or thought regularly or predictably to hold significant numbers of a population of a globally threatened waterbird species.

CSN criterion 2: The site is known or thought regularly or predictably to hold >1% of a flyway or other distinct population of a waterbird species.

The CSN criteria will be applied every four years to the updated data held in Wetlands International and BirdLife's databases.

Location of the Critical Sites in the AEWA region

In 2010, 3087 Critical Sites were identified within the AEWA region for 559 populations of 244 waterbird species[6]. The number of Critical Sites identified per country ranged from 0 to 198. Countries with the highest number of Critical Sites identified were Russia, Germany, UK, Spain, France and Iran (all with more than 100 Critical Sites identified). Clearly this reflects monitoring effort and data availability rather than solely a genuine hierarchy of importance of countries for waterbirds, underlining the need for more widespread waterbird monitoring across the entire AEWA region. The importance of Critical Sites for the populations they hold varies, with 64% of the Critical Sites holding 1-10% of any population in entire AEWA region.

The importance of Critical Sites for the populations they hold varies, with 64% of the Critical Sites holding 1-10% of any population in a given season and only 11% of Critical Sites supporting more than 10% of any individual populations.

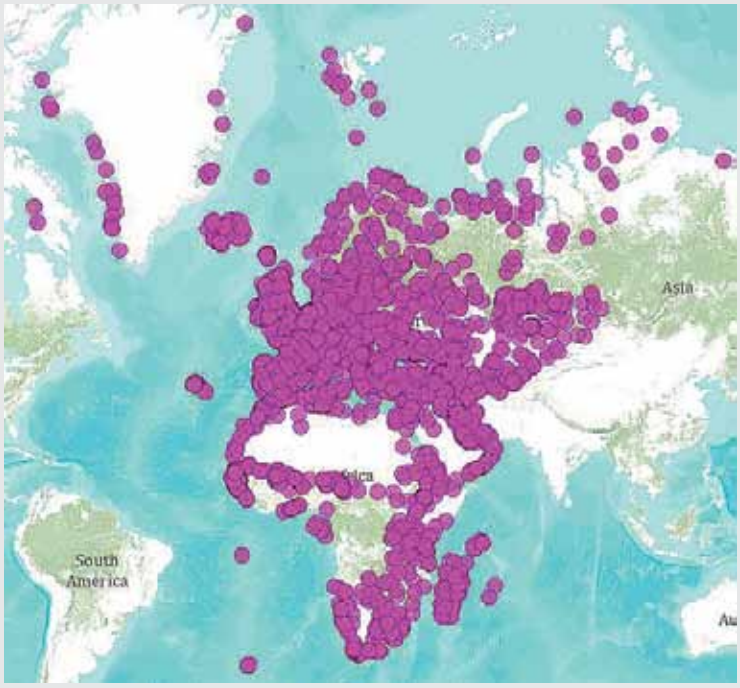


Figure. 4: The Critical Sites identified for waterbirds in the AEWA region in 2010.

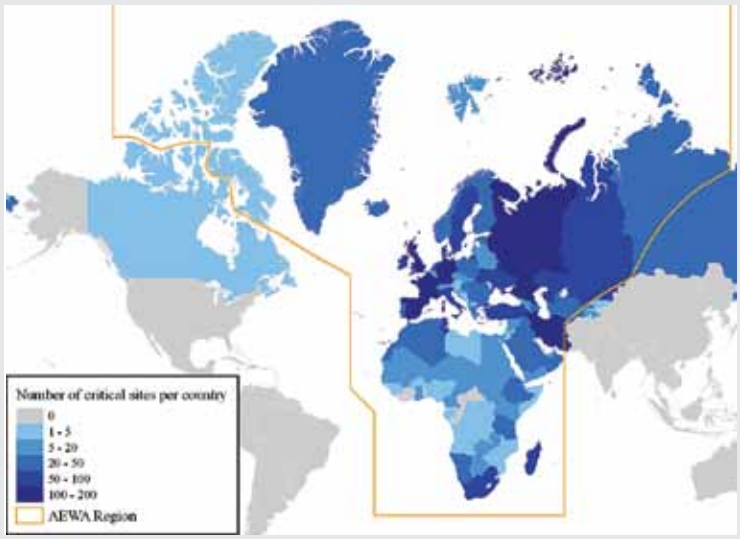


Figure. 5: Map of the AEWA region showing number of Critical Sites identified per country.

Critical Sites vary in the number of qualifying species with 44% qualifying for only one species, 21% for two species and 10% for three species. The remaining 25% of sites qualify for between 4 and 49 species (Fig. 6). Sixty five percent of the Critical Sites identified for a single species hold more than 1% of the relevant flyway population and 8 sites include the majority of the population. The remaining sites identified for a single species have been identified either for Globally Threatened species under CSN criterion 1 or because 1% of the population exceeds 20,000 individuals.

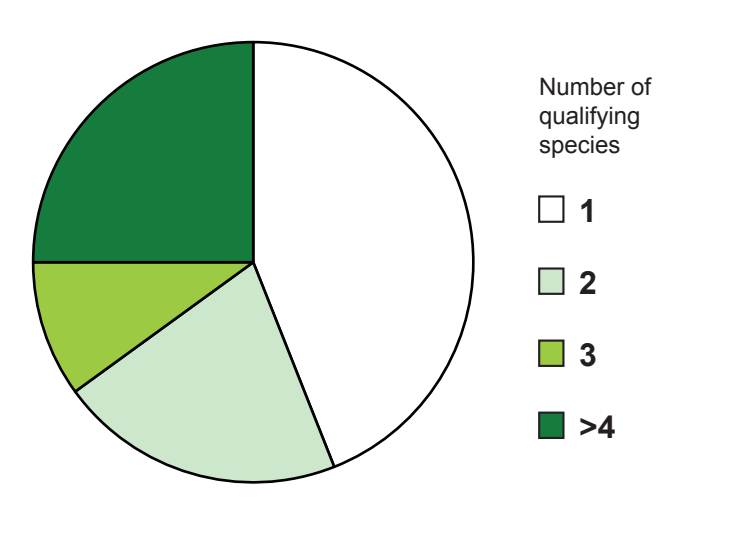


Figure. 6: Percentage of Critical Sites displayed by number of qualifying species

Level of coverage of populations by the CSN

'Coverage' of a population by the CSN refers to what percentage of the total known population[7] is captured by the CSN in a given season. The average coverage of populations by the CSN tends to be lower during the breeding season than during passage or non-breeding. This is likely to reflect features of species ecology, since many waterbirds disperse to breed and therefore do not attain 1% thresholds for critical site identification in breeding areas.

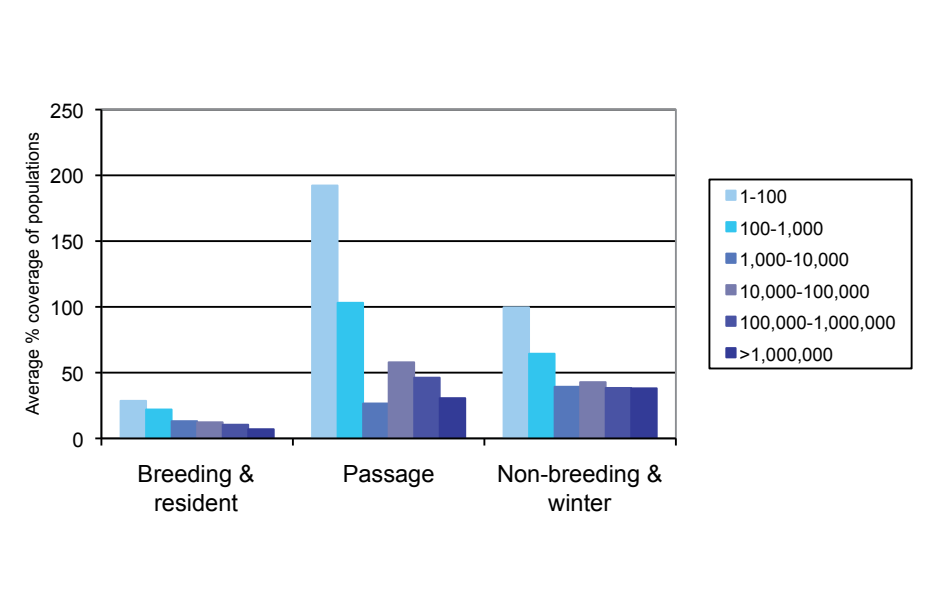


Figure. 7: Average percentage coverage of populations of different sizes by the CSN during different seasons.

Smaller populations of fewer than 1,000 individuals tend to be better covered by the CSN than larger populations. This probably reflects the fact that many of these smaller populations are globally threatened and therefore a large proportion of sites at which they occur qualify as Critical Sites under criterion 1. Above a population size of 1,000 individuals coverage by the CSN appears to be more strongly influenced by the degree of congregatory behaviour of the species concerned and by the level of knowledge we have about existence of critically important sites.

When percentage coverage is broken down by family, waterbird families tend again to be better covered by the CSN during the passage and non-breeding periods than during the breeding season. In general, the coverage of soaring bird families such as storks, pelicans and cranes is very high because they tend to concentrate at a chain of key sites leading up to geographic bottlenecks such as the Straits of Gibraltar, Messina, Bosporus and Gaza. The coverage of the network declines once they disperse at the non-breeding grounds. The coverage of long-distance migrant, Arctic-breeding geese and swans also tends to be very high with 14 out of the 20 best covered populations belonging to the family Anatidae, reflecting their highly congregatory behaviour during the non-breeding season. Herons and divers are generally poorly covered by the CSN because outside of the breeding period their roosting and feeding groups are generally too small to meet 1% population thresholds, especially in Africa. Flamingos are better covered during the non-breeding period than during the breeding season because only a small proportion of the population breeds each year.

Populations poorly covered by the CSN tend to be those with a dispersed distribution, with individuals often occurring solitarily, such as Common Snipe *Gallinago gallinago*, Great Bittern *Botaurus stellaris* and Corncrake *Crex crex* (Table 1). This dispersed occurrence means that threshold numbers of 1% of the population are unlikely to occur at any one site and indeed indicates that site-based conservation might not be the most appropriate tool for their conservation. However, the cryptic behaviour of some of these species, the inaccessibility of their habitats and knowledge-gaps may also play a role.

Common Snipe, a widespread species in the region - © istockphoto.com

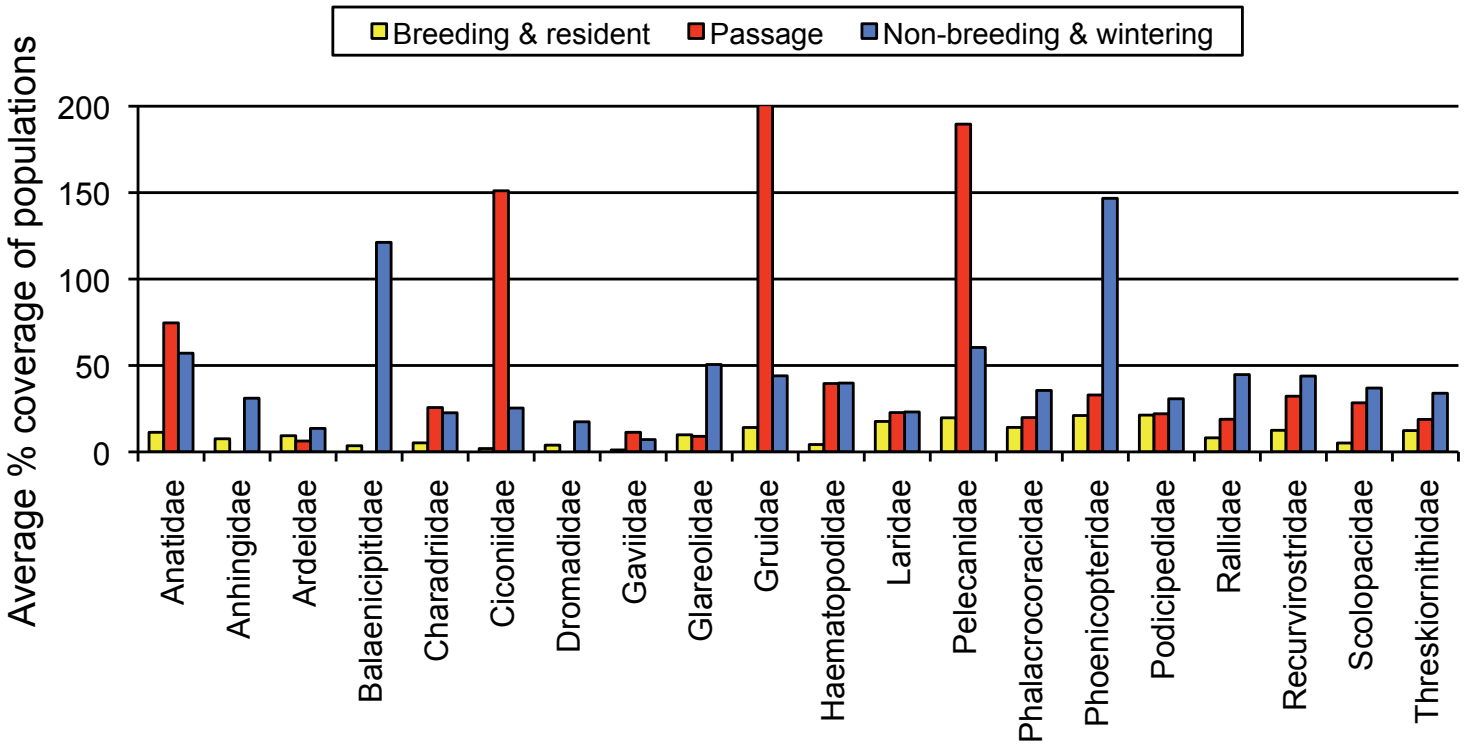


Figure. 8: Average percentage coverage of waterbird populations belonging to different families by the CSN.

Population[8]	Breeding	Resident	Passage	Non-Breeding
Gallinago gallinago faeroeensis		1.7		1.7
Eudromias morinellus, Asia (bre)		1.6		1.6
Vanellus spinosus, SE Europe, Asia Minor			1.6	1.6
Rissa tridactyla tridactyla Greenland (bre)	1.6			1.6
Crex crex, C & E Europe, Asia (bre)	1.5			1.5
Sterna bengalensis emigrata			1.4	1.4
Porzana parva parva	1.4			1.7
Gallinago gallinago gallinago, Europe (bre)	1.2			1.2
Glareola nuchalis nuchalis			1.2	1.2
Anous stolidus stolidus	1.1			1.1
Botaurus stellaris stellaris, W & Central Asia (bre)	1.0			1.0
Glareola pratincola pratincola, SW Asia (bre)	0.9			0.9
Charadrius dubius curonicus, W, Central Europe, NW Africa (bre)		0.9		0.9
Larus hyperboreus leuceretes	0.9			0.9
Anser erythropus, C & E Siberia		0.3	0.5	0.8
Anas capensis, S Africa			0.6	0.6
Sterna bergii velox, Persian Gulf & Indian Ocean (bre)	0.6			0.6
Gallinago media, Scandinavia (bre)	0.4			0.4
Larus glaucoides glaucoides	0.4			0.4
Botaurus stellaris capensis	0.3			0.3
Porzana porzana, W & NW Europe (bre)	0.1	0.0		0.1
Crex crex, W & NW Europe (bre)	0.1			0.1

Table 1: Populations poorly covered by the CSN in different seasons. Percentages represent the percentage of the estimated population captured within the CSN in a given season.

Top Critical Sites

Summing (or aggregating) the percentages[9] of each population for which the site has been identified as critical can be used to give a crude measure of the site's importance relative to other sites. Most Critical Sites (51%) have an aggregated percentage of less than 10% of the waterbird populations they hold, but some hold much higher aggregated percentages and the top 20 of these sites are listed below (and illustrated in Fig. 9 in relation to their protection status).

Clearly given the importance of these sites for a large number of populations, their effective conservation is paramount to maintaining healthy waterbird populations in the AEWA region and any deterioration in these sites could have a negative impact on large numbers of species.

The number of species for which a site qualifies as a Critical Site shows a strong positive correlation with the aggregated percentage coverage of populations at that site (Fig. 10), indicating that those sites which support a high diversity of waterbird species also tend to be important in terms of the population percentage they hold. In other words good sites tend to support both a broad diversity of species and large populations of those species.

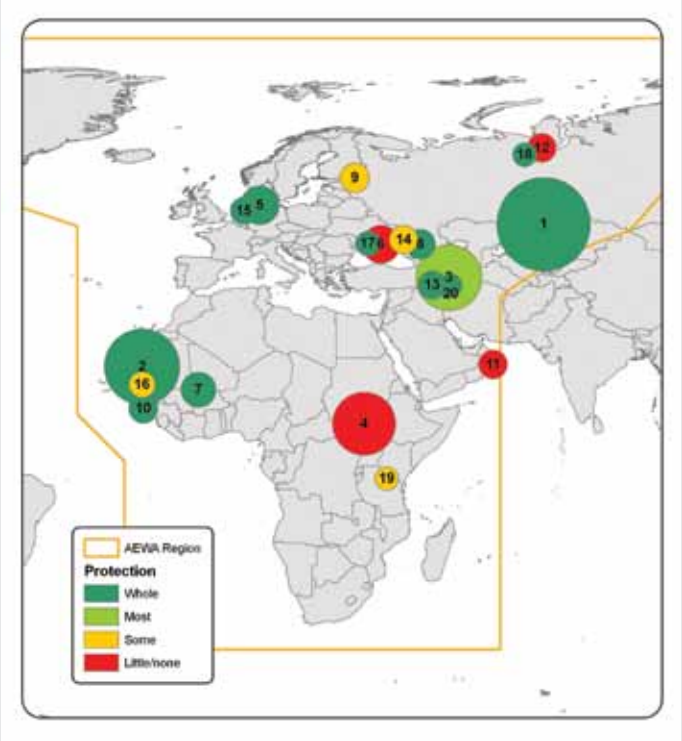
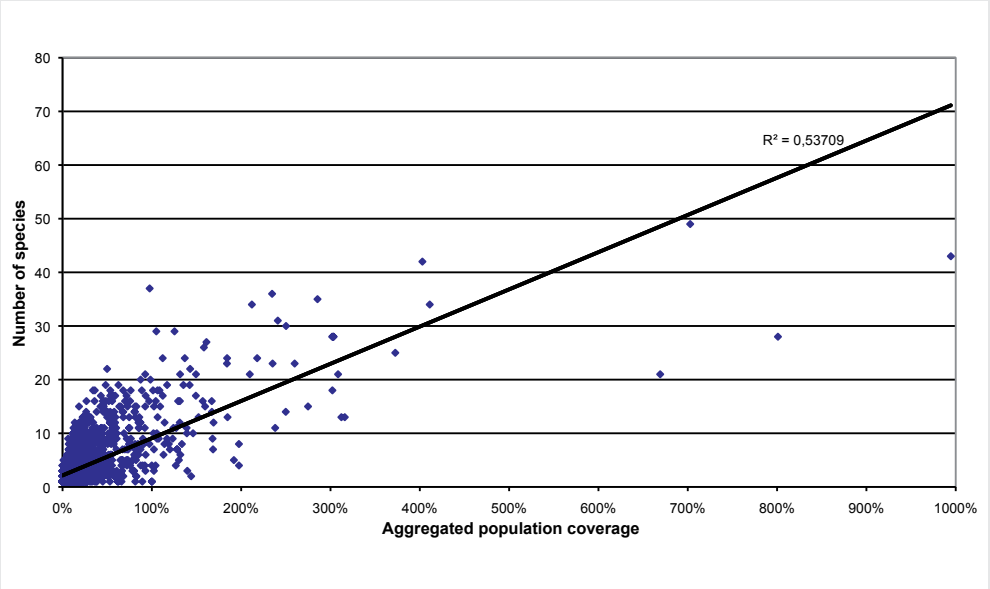


Figure. 9: The 'Top 20' Critical Sites holding highest aggregated percentages of the populations they are identified for displayed by their protection status. Aggregated percentage is presented by sized dots and follow site names listed in Table 2.

Country	Site number & name	Number of qualifying populations	Aggregated percentage population coverage
Kazakhstan	1. Korgalzhyn State Nature Reserve	43	995
Mauritania	2. Banc d'Arguin National Park	28	801
Azerbaijan	3. Gizilagach State Reserve	49	703
Sudan	4. Sudd (Bahr-el-Jebel system)	21	669
Germany	5. Schleswig-Holstein Wadden Sea National Park	34	411
Ukraine	6. Syvash Bay	42	403
Mali	7. Lac Débo - Lac Oualado Débo	25	373
Russia	8. Lake Manych-Gudilo	13	316
Russia	9. Berezovye islands of Vyborg Bay	13	312
Guinea-Bissau	10. Arquipélago dos Bijagós	21	308
Oman	11. Barr al Hikman	28	304
Russia	12. Lower Ob'	28	303
Iran	13. Lake Uromiyeh	18	302
Russia	14. Delta of the River Don	28	302
Netherlands	15. Wadden Sea	35	285
Senegal	16. Djoudj wetlands	15	275
Ukraine	17. Yagorlyts'ka and Tendrivs'ka Bays	23	260
Russia	18. Dvuob'ye	30	250
Tanzania	19. Lake Manyara National Park	14	250
Iran	20. Anzali Mordab complex	31	241

Table 2: Top 20 Critical Sites according to aggregated percentage coverage of the populations occurring at each site.



Of course aggregated percentage is a crude measure of a site's importance and all Critical Sites are valuable to the populations they hold. Many other factors affect the 'value' of a site for waterbirds. Even sites critical for only one or two populations can be vital for those populations and even sites holding only a relatively small percentage of a population may play a key role by, for example, providing the only stop-over opportunity in a large geographic area.

Figure. 10: Relationship between aggregated percentage population coverage and the number of species for which the site qualifies as 'critical'.

Great Bittern, a species poorly covered by the CSN - © Gábor Simay

Lesser White-fronted Goose (Anser erythropus) classified as Vulnerable on the IUCN Red List - © Tim Faasen

3. Threats to the Critical Site Network

Primary threats to the site network

There are undoubtedly many threats to the CSN. These threats are not currently recorded systematically throughout the network, but there are some data on threats to those Critical Sites that are also BirdLife IBAs (Fig. 11). These data represent only about one third of Critical Sites and it should be noted that threat data have been recorded for many more sites in Europe than in other parts of the AEWA region. The top threats recorded overall as having a high impact on Critical Sites are recreation / tourism, disturbance to birds, aquaculture / fisheries, agricultural intensification / expansion, unsustainable exploitation, industrialization / urbanization and infrastructure.

In the Middle East (Fig.12), agricultural intensification / expansion, disturbance to birds and unsustainable exploitation are all identified as important threats, while in Europe, recreation / tourism, disturbance to birds and aquaculture / fisheries emerge as the most important threats. In Central Asia, disturbance again emerges as a key threat, along with aquaculture / fisheries and agricultural intensification / expansion. 'Threat data have been recorded for relatively few sites in Africa, but disturbance once more appears as a key threat, along with aquaculture / fisheries and recreation / tourism.

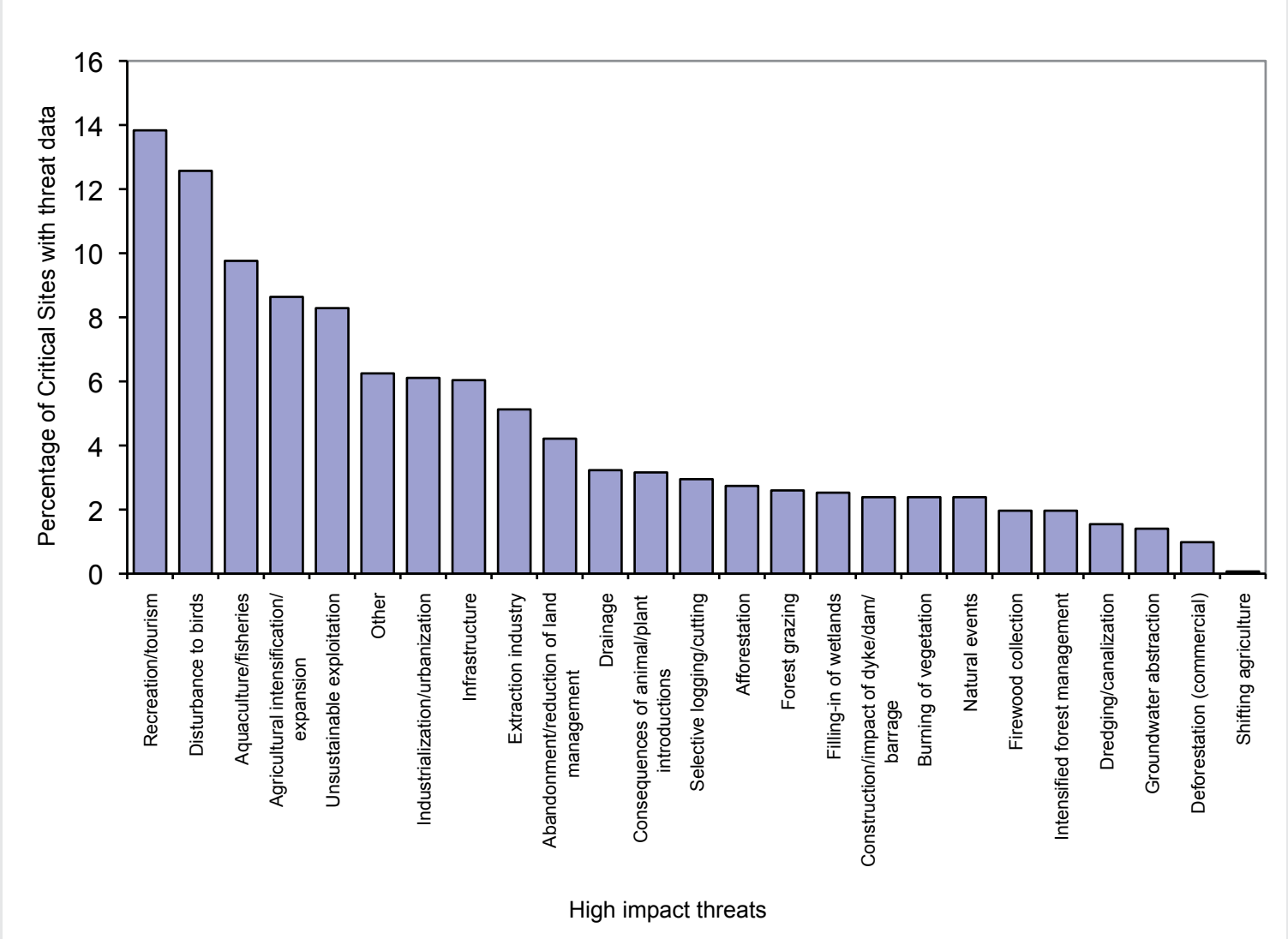


Figure. 11: Of those Critical Sites with threat data (n=1424), percentage with threats of different types recorded as having high impact on the site. Analysis from IBA data in the WBDB.

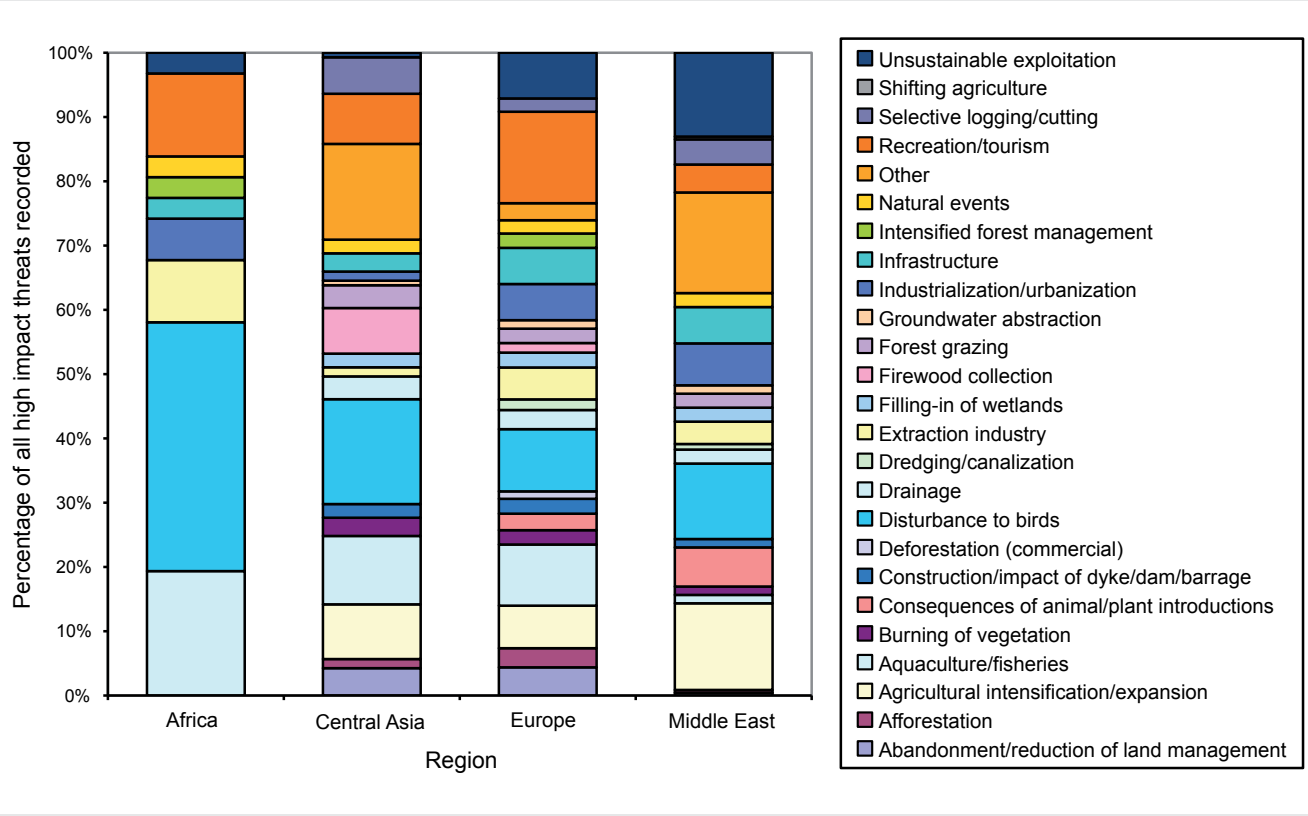


Figure. 12: Regional comparison of high impact threats recorded at Critical Sites. Number of sites with high impact recorded in Africa(n=19), Central Asia (n=58), Europe(n=640) and Middle East (n=97). Analysis from IBA data in the WBDB.

Disturbance of birds is a key threat impacting Critical Sites throughout the AEWA region. Little Tern (Sterna albifrons) - © Chris Gomersall (rspb-images.com)

Agricultural intensification is an important threat to Critical Sites, particularly in the Middle East and Central Asia. - © David Wootton (rspb-images.com)

While some bird populations can support harvesting if carried out sustainably, unsustainable exploitation remains a threat to many Critical Sites and the waterbird populations they support, in all parts of African-Eurasia. - © Ward Hagemeijer

Industrialisation, urbanisation and infrastructure development threaten Critical Sites throughout the AEWA region. In many countries coastal wetlands are seen as wasteland suitable for reclamation and development. - © David Davies

4. Conservation solutions

One size does not fit all

There are many possible approaches to achieving effective conservation of waterbirds in the African-Eurasian region and for many species employing a number of different approaches in combination offers the best chance of maintaining or achieving favourable conservation status.

The protected area approach

Since many waterbird species are congregatory at some stages of their annual cycle, and the same sites are often important for many different waterbird species, ensuring that all Critical Sites for waterbirds meeting the Ramsar criteria 5 or 6 are safeguarded across the African-Eurasian region is one very important conservation tool. A number of different Multilateral Environmental Agreements specifically address site protection. The Ramsar Convention requires Contracting Parties to designate at least one site for inclusion in the List of Wetlands of International Importance, but they are expected to designate additional "suitable" wetlands for the List, on the basis of their international significance in terms of ecology, botany, zoology, limnology or hydrology, as measured by reference to the Convention's Criteria for Identifying Wetlands of International Importance. The Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance of the Convention on Wetlands (Ramsar, Iran, 1971)[10] sets long-term targets for the Ramsar List in relation to each criterion.

In accordance with the provisions of the Convention on the Conservation of Migratory Species of Wild Animals, the AEWA requires the Parties to identify sites and habitats for migratory waterbirds occurring within their territory and encourage the protection, management, rehabilitation and restoration of these sites and to coordinate their efforts to ensure that a network of suitable habitats is maintained or, where appropriate, re-established throughout the entire range of each migratory waterbird species concerned[11]. The AEWA Action Plan[12] requires the Parties to establish protected areas, especially at sites which meet internationally accepted criteria of international importance[13], for the conservation of habitats important for the populations listed in Table 1 of the Action Plan, and to develop and implement management plans for these areas. Although the AEWA Action Plan does not provide any further guidelines concerning the criteria for site selection, the AEWA Conservation Guidelines #3[14] establish a clear link to the relevant Ramsar criteria.

The Natura 2000 network is an ecological network made up of Special Protection Areas and Special Areas of Conservation set up by the European Community through the Birds and Habitat Directives. To implement the network outside the European Union the Bern Convention established the Emerald network. With the political support of the Council of Europe, the Bern Convention developed the Pan-European Ecological Network, in which the EU's Natura 2000 programme and the Emerald network of Areas of Special Conservation Interest established in the countries that are not EU members, co-exist.

The Convention on Biological Diversity requires that Parties should establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity and develop guidelines for the selection, establishment and management of such areas. Parties are also required to regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use. They should also promote the protection of ecosystems and promote environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering protection of these areas. At the Nagoya Biodiversity summit in October 2010, a target was established to expand the existing protected area network to include 17 % of terrestrial and inland water areas and 10 % of marine and coastal areas.

Common Pochard (Aythya ferina) - © Ivaylo Zafirov

For migratory species the flyway approach is key to addressing connectivity of sites and comprehensiveness of site coverage. Protecting 17% of terrestrial inland water area will be ineffective if it leaves large geographic areas unprotected, fails to provide stepping stones where birds can stop, rest and refuel at intervals within the physiological limits of migrating species, or only protects species during particular seasons. In addition, protecting an adequate network of sites will be key to supporting adaptation to a changing climate and allowing species sufficient flexibility as they respond to a barrage of different threats. To achieve the conservation benefits of site protection, national and international authorities must ensure that protection on paper translates into protection on the ground. To this end monitoring is key; not only monitoring of bird populations, but monitoring the state of the habitats and the severity of threats facing the site. Regular monitoring facilitates early detection of any deterioration and appropriate action can then be taken promptly.

However, the protected area approach is not appropriate for all species; some waterbird species at some or all stages of their annual cycle are too dispersed for conservation of individual sites to be an effective tool. In these cases landscape-scale conservation measures or other tools will be required to achieve effective conservation.

Only around one quarter of all Critical Sites are thought to be wholly designated as protected areas and 42% are thought to have little or no protection at all (Fig. 13).

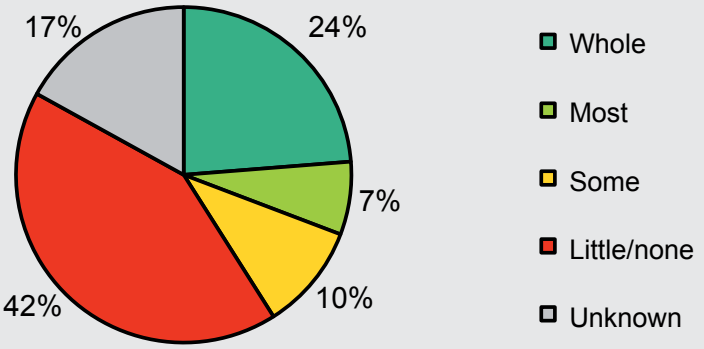
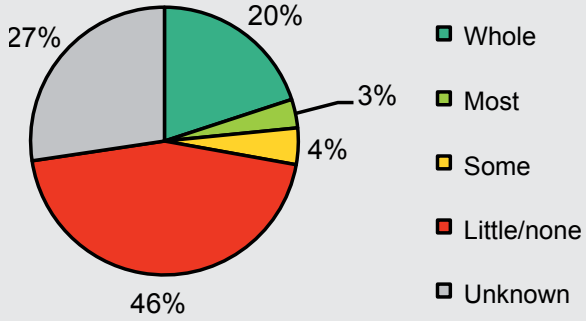


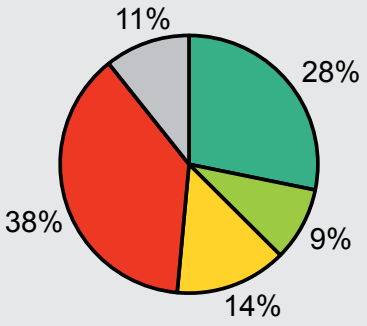
Figure.13: Protection status of all Critical Sites in the AEWA region (analysis from the WBDB, drawing on the WDPA[15]).

Many Critical Sites are currently unprotected by any designation and many of those which appear to be protected may not be properly protected on the ground. Alarmingly despite the great importance of the 'top 20' Critical Sites for waterbirds, some of these sites appear to have little or no protection in place (see Fig. 9, and this needs to be addressed as a matter of urgency).

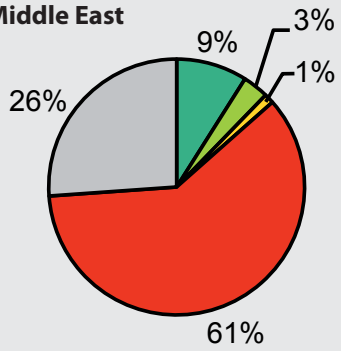
14a - Africa



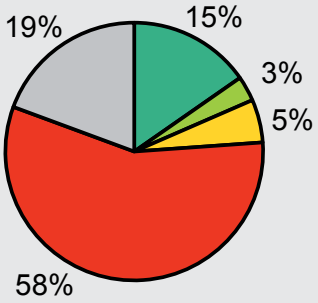
14b - Europe



14c - Middle East



14d - Central Asia



Figures. 14a-d: Protection status of all Critical Sites in AEWA presented by region. Analysis from the WBDB drawing from the WDPA[15].

Brent Geese (Branta bernicla) - © istockphoto.com

Black-tailed Godwit (Limosa limosa) - © Daniel Bergmann

The degree of apparent protection of Critical Sites varies between the regions with more than a third of the Critical Sites in Europe being wholly or mostly protected compared with about a quarter of Critical Sites in Africa. In fact the protection of Critical Sites in Europe may be more complete than this given that there are known gaps in the WDPA in relation to European site designations. Only 18% of Central Asian sites are wholly or mostly protected while the situation is worse in the Middle East with only 12% of sites being mostly or wholly protected. Even in Europe where protection is relatively good more than one third of sites appear to have little or no protection and in Central Asia and the Middle East around 60% of Critical Sites have little or no protection. The legal protection status of Critical Sites identified (at least in part) for globally threatened birds is worse than the overall situation with more than half of them having little or no protection (Fig. 15). However the presence of very small numbers of individuals may qualify a site as critical for a globally threatened bird and unless particularly important for other bird species also, many of these sites might not be considered by National authorities as a priority for protection.

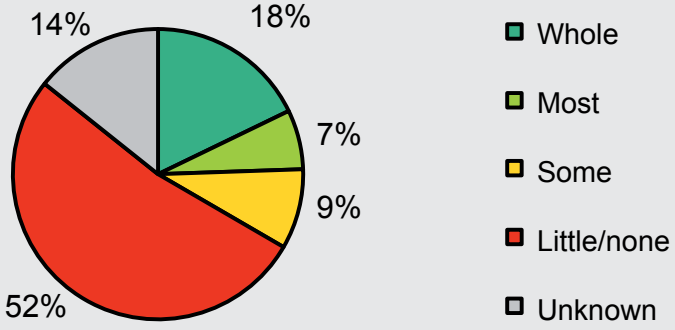


Figure. 15: Protection status of all Critical Sites identified for globally threatened bird species under CSN criterion 1. Analysis from the WBDB drawing from the WDPA.

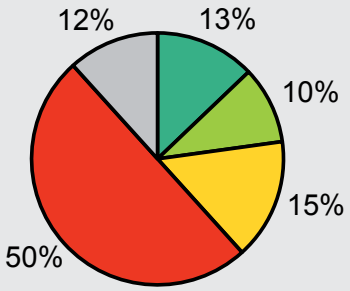
Common Redshank (Tringa totanus) - © Gábor Simay

Common Goldeneye (Bucephala clangula) - © www.sxc.hu

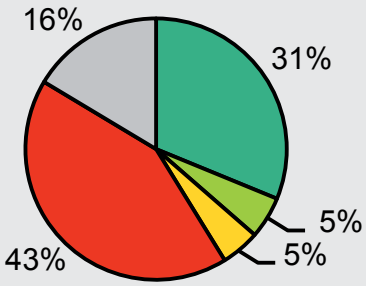
However, the picture is not uniform across the different regions (Fig. 16). Levels of protection for European Critical Sites for globally threatened birds are probably underestimated and according to the WDPA, less than 40% of Critical Sites are wholly or mostly designated as protected areas. Whereas in Africa, 50%, in Central Asia, 64% and in the Middle East, 70% of Critical Sites for globally threatened birds appear to have little or no protection, and this certainly warrants further investigation.

Grey-headed Gull (Larus cirrocephalus) - © Mieke Vandenabeele

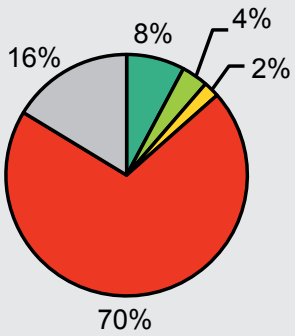
16a - Africa



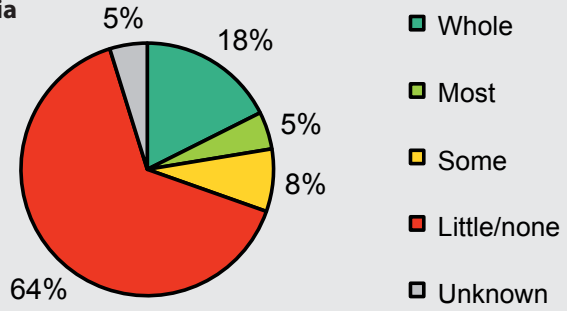
16b - Europe



16c - Middle East



16d - Central Asia



Figures. 16a-d: Protection status of all Critical Sites identified for globally threatened birds in AEWA presented by region. From the WBDB drawing from the WDPA.

Pygmy Cormorant (Phalacrocorax pygmeus) - © Gábor Simay

Local action for Critical Sites: The Lake Qarun Site Support Group

Local communities can play a vital role in the conservation of the CSN. For example, a grassroots conservation group in Egypt has successfully brought to an end the dumping of building waste at one of the country's key wetlands. Lake Qarun Protected Area, in northern Egypt, is an important non-breeding and staging site for migratory waterbirds. The area is an IBA and a Critical Site for Slender-billed Gull *Larus genei* throughout the year and hosts an important population of Black-necked Grebe *Podiceps nigricollis* in the non-breeding period. Unfortunately, unregulated tourist development along the southern shores of the lake is threatening some of the area's best waterbird habitats.

In order to enhance conservation efforts at the lake, a Site Support Group (SSG) was established by Nature Conservation Egypt — a BirdLife Affiliate. The group's members are drawn from the local community and include amongst their number fishermen, school teachers, farmers and workers from the local salt extraction plant. The Lake Qarun Protected Area SSG has proved to be an important point of contact between the lakeside community and the Protected Area authority, as well as the Egyptian government. When one of the country's most powerful construction companies began dumping building waste on the lake shore, the SSG took photographic evidence to the Egyptian Environmental Affairs Agency. The dumping was ordered to stop, and bulldozers at work on a tourist development were pulled back from the shoreline. The developer has subsequently agreed to set aside an area of saltmarsh as a bird sanctuary and has cancelled plans for a hunting lodge.

Location of the Critical Site Lake Qarun displayed in the CSN Tool.

Slender-billed Gull - © Tim Faasen

Black-necked Grebe - © istockphoto.com

WOW Demonstration Projects

The WOW project has been supporting field projects at 11 demonstration sites located in 12 countries in Africa and Eurasia. These are all Critical Sites for waterbirds and the projects contribute to addressing the causes of current biodiversity loss at these sites, creating new opportunities for local communities to simultaneously sustain their livelihoods and benefit the environment. Many of the demonstration sites also function as a training ground where site managers can get hands on experience in best practice management.

The field projects themselves have made significant contributions to site-based and regional-level wetland conservation needs while breaking new ground in showcasing new ideas and methodologies needed for effective flyway-scale conservation.

Overview of the Project sites

1. Estonia - Haapsalu-Noarootsi Bays

Part of a larger Critical Site for numerous waterbird populations, a management plan has been developed at Haapsalu-Noarootsi Bays to integrate ecotourism activities, nature conservation measures and human activities at the local level.

2. Hungary - Biharugra Fishponds

This forms part of a Critical Site for waterbird populations including Greater White-fronted Goose, Greylag Goose *Anser anser* and Black-tailed Godwit. The project has introduced a 'nature friendly' fish-farming strategy that is benefiting both the environment and the local economy.

3. Lithuania - Nemunas River Delta

Nemunas River Delta is a Critical Site for Greylag Goose, Smew *Mergellus albellus*, Common Pochard and Whooper Swan *Cygnus cygnus* populations as well as other waterbirds. The project restored degraded wetlands, created new ecotourism facilities and established an education and research centre on migratory birds.

4. Mauritania - Banc D'Arguin National Park

This is one of Africa's most important wetlands and is a Critical Site for 27 waterbird populations including Greater Flamingo *Phoenicopterus roseus*, Eurasian Spoonbill *Platalea leucorodia* and many wader populations. The demonstration project here aimed at enhancing the economic status of the park by developing its ecotourism potential.

5. Niger - Namga-Kokorou Complex

A community-based management plan has been created in order to promote sustainable use of the wetlands and their products and the conservation of the wetlands from the encroaching sand dunes at this site, which is a Critical Site for a population of Comb Duck *Sarkidiornis melanotos*.

6. Nigeria - Hadejia-Nguru Wetlands

A Critical Site for Fulvous Whistling-duck *Dendrocygna bicolor*, White-faced Whistling-duck *Dendrocygna viduata*, Spur-winged Goose *Plectropus gambensis* populations and many other waterbirds, at times Hadejia-Nguru Wetlands supports over 400,000 non-breeding and staging waterbirds. The demonstration project here has enabled the local community to restore a significant tract of wetland habitat through the clearance of *Typha*, a native but highly invasive reed species.

7. Senegal & The Gambia - Saloum-Niumi Complex

The contiguous Delta du Saloum in Senegal and Niumi National Park within the Gambia are Critical Sites for numerous waterbirds including several gull and tern species. The demonstration project here has supported the development of an integrated trans-boundary management plan, in combination with environmental education and awareness-raising within local communities.

8. South Africa - Wakkerstroom Wetlands

The Wakkerstroom wetlands are part of the vast Grassland Biosphere Reserve (proposed), a Critical Site for numerous waterbird populations including Black-winged Lapwing *Vanellus melanopterus*, and the endangered White-winged Flufftail *Sarothrura ayresi*. The project has directly engaged all segments of the local community in the running of the site through a series of activities focusing on ecotourism and related local products.

9. Tanzania - Dar Es Salaam Wetlands

The coastal wetlands at Dar Es Salaam host critically important numbers of waterbird species in the non-breeding period including 2,000 Madagascar Pratincoles *Glareola ocularis* and 3,000 Roseate Terns *Sterna dougallii*. The project aimed to establish and operate a new wetland conservation and education centre.

10. Turkey - Burdur Gölü

This lake is the world's most important non-breeding site for the endangered White-headed Duck *Oxyura leucocephala*; in some years more than two-thirds of the global population congregates here and it has been identified as a Critical Site for populations of this species and 10 others. The project raised awareness about wetland conservation and sustainable water use throughout the local community.

11. Yemen - Aden Wetlands

The Aden wetlands are critical for populations of several species including Eurasian Spoonbill. The project implemented a recently developed management plan which identifies different stakeholders' rights and responsibilities in order to ensure the conservation of the area's natural resources.

Beyond protected areas: River basin management in the Inner Niger Delta

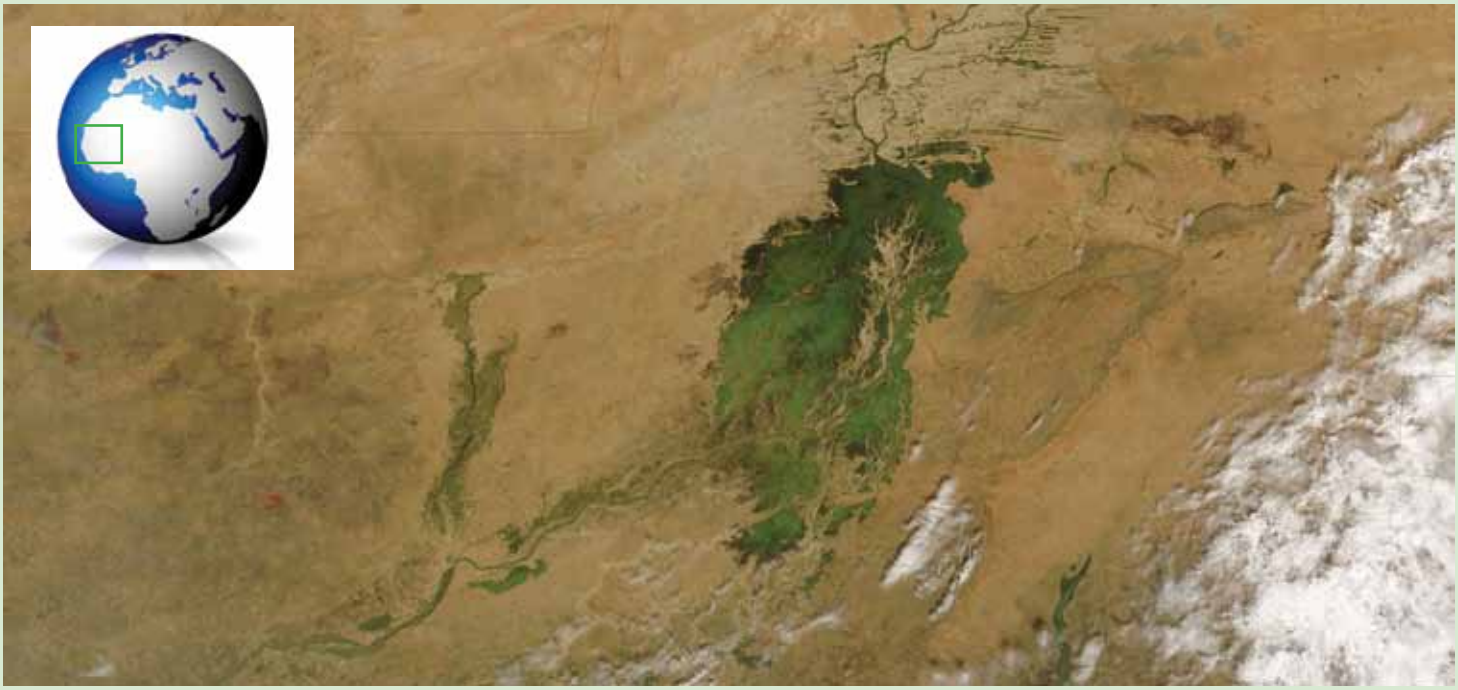
Critical Sites for waterbirds do not function in isolation of the wider environment. Instead, they depend on hydrological processes across entire ecoregions. Landscape-scale conservation is needed alongside site-scale approaches to safeguard these areas.

The Inner Niger Delta is located within the semi-arid Sahel savanna in central Mali. The area is a massive floodplain comprising permanent lakes and vast seasonally-flooded plains. The extent of wet-season flooding is determined by the inflow of water from the Niger and Bani Rivers. This in turn is governed by the volume of rainfall several hundred kilometres to the south. From July onwards, water levels rise rapidly, typically swelling by four metres in just 100 days. The floodwaters 'pulse' through the delta from the south- west. By the time they reach the north-eastern plains in November the waters will have already subsided in the south. In some years, the water level can peak a full six metres above its dry-season height. In extremely dry years, however, the floodwaters barely reach three metres. The area under water at any one time can exceed 25,000 km^2; however, in years of extreme drought, such as occurred in 1984, less than 5,500 km^2 can be flooded (Zwarts *et al.* 2009).

A number of Critical Sites have been identified within the Inner Niger Delta. Collectively, they support huge numbers of waterbirds — both resident species and migrants from across Eurasia, who time their arrival with the onset of the wet-season. The number of waterbirds that the delta can support is directly related to the extent of flooding during this period. In good years peak counts can include 900,000 Garganey, 300,000 Northern Pintail *Anas acuta*, 315,000 Cattle Egret *Bubulcus ibis*, 50,000 Purple Heron *Ardea purpurea*, 183,000 Squacco Heron *Ardeola ralloides*, 25,000 Glossy Ibis *Plegadis falcinellus*, 9,000 Gull-billed Tern *Sterna nilotica* and 3,500 Caspian Tern *S. caspia* (Zwarts *et al.* 2009).

The extent of flooding is also critical to local communities. The region is inhabited by more than a million people, many of whom rely on the floodplain for their livelihoods. The delta provides water for crop irrigation, verdant grazing land for livestock and is a major source of fish, with 60,000 - 120,000 tonnes landed annually (Zwarts and Diallo 2005).

Unfortunately, the river-basin ecosystem is at risk from external threats. Since the middle of the 20th century, several dams have been constructed upstream of the delta. The largest of these, the Selingue dam on the Niger River, became operational in 1982. This dam alone withholds 2 km^3 of water from the delta and has reduced the extent of flooding by 600 km^2 (5%). Additional dams have been proposed, including one at Djenné on the Bani River. Should these be built, it is calculated that the total loss of floodplain would rise to about 15-20%, or 2,500-3,000 km^2. A further 2.5% of floodplain has also been lost through the excessive extraction of water for large irrigation schemes (Zwarts and Grigoras 2005). Unless the management of upstream water reservoirs and irrigation regimes is altered, there is likely to be a permanent reduction in the extent of the Inner Niger Delta floodplain resulting in sizeable losses of waterbirds and negative impacts on local communities.



At its height the Inner Niger Delta, which incorporates several Critical Sites, represents a 25,000 km^2 shifting oasis for waterbirds within the otherwise arid Sahel (image from NASA).

Conservation in the wider landscape – the Migratory Soaring Birds project

Site-based conservation alone is insufficient to protect many migratory bird species, and sometimes conservation in the wider landscape is the best means of addressing threats. BirdLife recently launched the innovative 'Migratory Soaring Birds' project to tackle threats to soaring birds along the Rift Valley / Red Sea flyway, a key route of the Africa-Eurasia flyway system. The project is funded through the Global Environment Facility (GEF) and implemented by the United Nations Development Programme (UNDP) and will be carried out by BirdLife in collaboration with NGOs and government agencies in a number of key countries along the Rift Valley/ Red Sea flyway.

Over 1.2 million birds of prey and 300,000 storks migrate along this corridor between their breeding grounds in Europe and West Asia and the non-breeding areas in Africa each year. While these birds are relatively well conserved in Europe and valued in east and southern Africa as part of the game park experience, they receive very little conservation attention during their migration. Yet in some species 50-100% of their global or regional population pass along the route and through flyway "bottlenecks" in the space of just a few weeks and these large, highly visible slow-moving birds are susceptible to localised threats during migration, such as hunting and collision with wind turbines, which could have severe impacts on global populations.

The nature of the threats to soaring birds and their pattern of migration, means that their conservation can only be achieved by considering land-use beyond the boundaries of protected areas and by involving sectors other than conservation in implementation. The Migratory Soaring Birds project will ensure conservation is incorporated into the production sectors where the threats originate – primarily energy, agriculture, waste management, development and tourism. To address the threats, BirdLife will engage these sectors in meaningful conservation action, with conservation and biodiversity integrated with, rather than distinct from, the rest of the economy.

White Storks (Ciconia ciconia) on migration - © istockphoto.com

Glossy Ibis - © istockphoto.com

Little Stint (Calidris minuta) - © Gábor Simay

Species Action Plans: Sociable Lapwing

An international project, involving cooperation across three continents, is helping to save the Sociable Lapwing *Vanellus gregarius*, one of the world's most imperilled migratory birds. Initially a collaboration between BirdLife partners in the UK and Kazakhstan, the Sociable Lapwing Project has since expanded to encompass conservationists and researchers in Russia, Turkey, Syria, Sudan, India and Iraq.

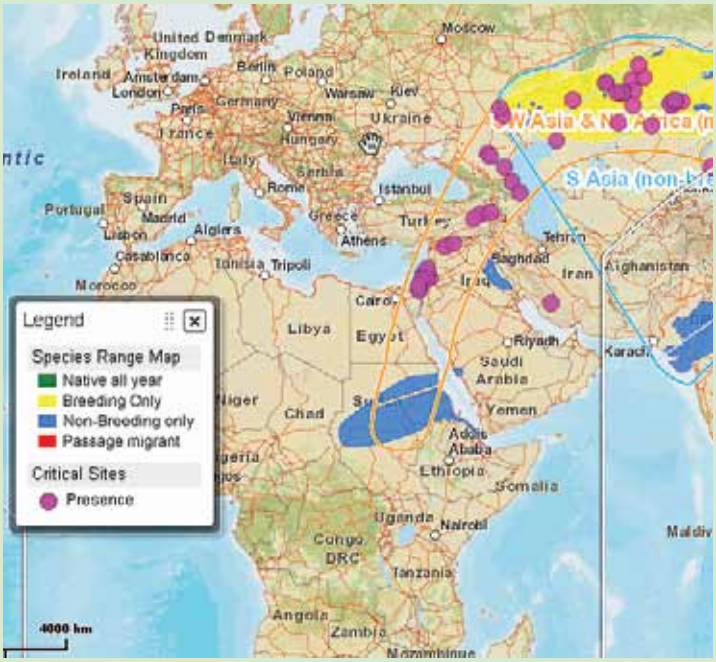
The Critically Endangered Sociable Lapwing breeds on the grassland steppes of northern and central Kazakhstan and south-central Russia. It passes through central Asia and the Middle East to non-breeding areas in Israel, Eritrea, Sudan and north-west India. The species underwent a precipitous decline of over 90% during the latter half of the 20th century. At one point, the global population was thought to number no more than 1000 pairs (Koshkin *et al.* 2010). Although the reasons for this decline were unclear, researchers suspected that breeding success was being compromised through predation and the trampling of nests by domestic livestock.

In response to the species' plight, a collaborative research project was begun by the Royal Society for the Protection of Birds (UK) and the Association for the Conservation of Biodiversity in Kazakhstan. In 2006, the project received financial support through the UK Government's Darwin Initiative and was expanded to include the BirdLife Partners in Turkey (Doğa Derneği), Russia (Russian Bird Conservation Union) and India (Bombay Natural History Society).

The research revealed important insights into the breeding ecology and migration of the Sociable Lapwing. Satellite-tracking showed that flocks from Kazakhstan migrate to Sudan via staging areas in Syria and Turkey. In 2007, individuals fitted with transmitters were tracked to Ceylanpinar in Turkey. When scientists caught up with them they found a single flock of 3,200 birds, suggesting that the population was substantially larger than previously thought. The satellite-tagged birds departed Turkey in late October, eventually arriving in central Sudan after a total trip of more than 8,000 km. The species had not been seen this far south in Africa for 20 years (Anon. 2008). In Kazakhstan, contrary to what was previously thought, research indicated that factors on the breeding grounds were not limiting the population size. Instead, it is now believed that hunting pressure on migration— particularly in the Middle East—is the most significant threat to the species.

As more and more insights into the Sociable Lapwing's migration have been revealed, the geographical scope of the project has widened. BirdLife Partners in Iraq (Nature Iraq) and Syria (Syrian Society for Conservation and Wildlife) are now active in monitoring Sociable Lapwings migrating through their territories, whilst in Sudan, conservationists from the Sudanese Wildlife Society are working to locate and protect the species' newly discovered non-breeding grounds.

The conservation of migratory birds depends on international collaboration and a coordinated conservation response across species' entire ranges. The Sociable Lapwing Project provides a model for how this can be achieved.



Location of the Critical Sites for the Sociable Lapwing displayed in the CSN Tool.

Sociable Lapwing - © Koshkin Maxim (www.rarebirdsyearbook.com)

Conserving the Critical Site Network – future directions

Identifying the Critical Site Networks for waterbird populations in the AEWA region has provided important information to help inform and prioritise conservation efforts, but considerable further work is required. Firstly there is an uneven spread of data availability in the AEWA region and while data for some countries / regions are fairly comprehensive and up-to-date, for other countries / regions data availability is poor. This reflects the very uneven pattern of monitoring effort demonstrated in Fig. 17 for IWC counts, with African sites being very poorly covered in comparison to European sites. In some countries there is regular waterbird monitoring at some sites, but these are a small subset of the important waterbird sites in the country.

In some countries there is no monitoring scheme running and, in others, important sites have not been monitored for 30 years. These are serious challenges that reflect the uneven distribution of resources and capacity across the AEWA region.

Secondly the Critical Site Networks that have been identified are incomplete; there are undoubtedly many as yet 'unknown' sites in the AEWA region that support significant numbers of waterbirds and which could qualify as critical for one or more populations. The longer term aim of establishing monitoring schemes in countries where none exists, or improving the spread / regularity of monitoring in poorly covered countries would certainly help to unearth some of these sites, but in the short term to identify these sites and evaluate them will require gap-filling surveys like those prioritised at regional workshops under the WOW project[16].

Even if the Critical Site Networks were complete, identifying them is just the first step; ensuring their effective conservation is the key task and as this report highlights, many Critical Sites are currently unprotected. Many more may be protected only on paper or not managed with the needs of the waterbird populations in mind. An important next step at the national level would therefore be to assess the Critical Site Networks identified for that country with a view to improving the protection of these sites under national, regional or international mechanisms. All Critical Sites should ideally be monitored regularly so that any declines in waterbird numbers or increases in threats to sites[17] can be detected and addressed.

Functioning networks of sites depend on functioning networks of people. Therefore, developing capacity of these networks of people is essential for the long-term success of flyway conservation at different levels. The WOW project has contributed to this by developing the 'Flyway Training Kit' and holding four sub-regional 'Training of Trainers' workshops across the AEWA region. The Flyway Training Kit consists of tailor-made training materials on topics related to the flyway approach and to migratory waterbird and wetland conservation. This resource is available in English, French, Arabic and Russian. In addition to the two comprehensive technical modules, the kit also includes practical materials for running a flyway training workshop, such as session notes, presentations and exercises. Training institutions and universities have started to use the material, which

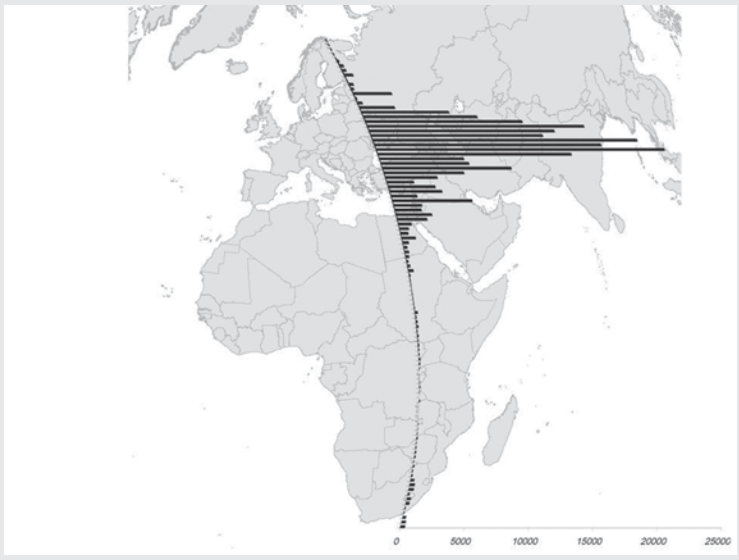


Figure. 17: Total number of IWC counts recorded per degree latitude (figure adapted with kind permission of David Kleijn).

is also available online[18]. The Flyway Training Kit is the first comprehensive training resource developed on flyway conservation and will enable a wide range of Critical Site managers and others to gain a better practical understanding of the role of migratory birds and the steps needed to manage them. The kit also introduces the CSN Tool, and courses based around the kit would include practical sessions on how to use the tool for conservation planning.

The WOW project has achieved significant progress towards improving the conservation of waterbirds in the AEWA region, and the CSN Tool is a valuable resource which will continue to support conservation planning and decision-making in the future. Improving the comprehensiveness of the CSN, its protection and its management are the challenges that lie ahead. The conservation of migratory waterbirds is a shared responsibility, and effective conservation and cooperation throughout the flyway will be key to improving the status of migratory birds. Innovative funding strategies will be needed with cross-regional collaboration to ensure that resources and capacity can be increased where they are needed most in the AEWA region.

The Flyway Training Kit is the first regional resource on flyway capacity building ever developed - © Umberto Gallo-Orsi

5. Endnotes & References

Endnotes

1. http://www.birdlife.org/action/science/species/global_species_programme/red_list.html

2. http://wow.wetlands.org/HANDSon/DEMONSTRATIONPROJECTS/tabid/119/language/en-US/Default.aspx

3. The common name used for the two Palearctic populations of Tundra Swan (*Cygnus columbianus*)

4. The Long Journey project was developed by the Dutch Government Service for Land and Water Management (DLG) with Wetlands International, the Leningrad State Regional Institute for Nature Conservation and the Leningrad State University with support from the BBI-MATRA Programme of the Dutch Ministry of Agriculture, Nature and Food Quality.

5. For further details on the CSN criteria see the User Guide on the help page of the CSN tool at: http://www.wingsoverwetlands.org/csntool

6. Critical Sites were not identified for all 294 WOW species because some species met neither criterion 1 (because they weren't globally threatened) nor criterion 2 (since they were sufficiently congregatory to meet 1% thresholds). For such species site-based conservation may not be the most appropriate means of achieving effective conservation.

7. Population estimates taken from Wetlands International (2006).

8. For common names of these species see CSN tool at: http://www.wingsoverwetlands.org

9. Aggregated percentage population coverage. A site that holds 10% of one population, 20% of a second population and 10% of a third population has an aggregated percentage population coverage of 10+20+10 = 40%, while a site that qualifies as critical for 40 populations holding 10% of each of these populations would have an aggregated percentage population coverage of 40 x 10 = 400%.

10. Adopted by Ramsar Resolution VII.11 (COP7, 1999) and amended by Resolutions VII.13 (1999), VIII.11 and VIII.33 (COP8, 2002), and IX.1 Annexes A and B (COP9, 2005).

11. AEWA Agreement text, Article III 2. (c) and (d). Available on http://www.unep-aewa.org/documents/agreement_text/agree_main.htm

12. AEWA Agreement text, Action Plan. Annex III, Article 3.2.1. Available on http://www.unep-aewa.org/documents/agreement_text/agree_main.htm

13. AEWA Agreement text, Annex III, Action Plan. Article 3.2.2. Available on http://www.unep-aewa.org/documents/agreement_text/agree_main.htm

14. AEWA Conservation Guidelines #3. Available at http://www.unep-aewa.org/publications/conservation_guidelines/pdf/cg_3new.pdf

15.The protection data currently held in the WDPA are incomplete re: EU site designations so it is likely that protection levels are underestimated in this analysis for European Critical Sites.

Gadwall (Anas strepera) - © istockphoto.com

16. http://wow.wetlands.org/LinkClick.aspx?fileticket=qGiI1eOQ4jU%3d&tabid=153&mid=801&language=en-US

17. BirdLife International has devised simple state, pressure, response methodology for monitoring sites, see http://www.birdlife.org/datazone/info/ibamonitoring

18. http://www.wingsoverwetlands.org/flywaytrainingkit/

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