*AGREEMENT ON THE CONSERVATION OF AFRICAN-EURASIAN MIGRATORY WATERBIRDS*

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*"Migratory waterbirds and people - sharing wetlands"*

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# PRELIMINARY REPORT ON THE SITE NETWORK FOR WATERBIRDS IN THE AGREEMENT AREA, 1st EDITION

## Introduction

Article IV of the Agreement text introduces the AEWA Action Plan, which is attached as Annex 3 to the Agreement. According to Paragraph 7.4 of the AEWA Action Plan, the Agreement Secretariat, in coordination with the Technical Committee (TC) and the Parties, shall prepare a series of international reviews on the implementation of the Action Plan. These reviews shall be prepared at different frequencies, as per paragraph 7.5, and shall be submitted to the Meeting for the Parties (MOP) for consideration. Amongst these seven international reviews is the Review on the networks of sites used by each population, including reviews of the protection status of each site as well as of the management measures taken in each case (aka Site Network Report – SNR).

In 2011 the Secretariat commissioned the 1st edition of the SNR (SNR1) to Wetlands International. Funding was kindly provided by the Federal Office for Environment (FOEN) of Switzerland to complement resources available from the Wings over Wetlands (WOW) project. The work was commissioned in accordance with Terms of Reference developed and approved by the TC at its 9th Meeting in April 2009. At its 10th Meeting in September 2011, the TC considered and agreed on a methodology for prioritisation of sites for designation and management proposed by Wetlands International.

The TC reviewed two drafts of the report and agreed that additional time would be needed to further develop this important paper in order to address some issues related to underlying data quality and types of data presentation and to submit the final SNR1 to MOP6. Nevertheless, the TC decided that the current advanced draft shall be submitted to MOP5 as a preliminary report for information to the Contracting Parties.

In the forthcoming triennium, the Contracting Parties and the other Range States, within an adequate consultation timeframe, shall fully engage in verifying and updating information on site designation and management derived from the master data sources used for SNR1. In the meantime, the Contracting Parties shall address priority designation and management issues as outlined by this preliminary report whenever these are based on complete/correct underlying information.

## Action requested from the Meeting of the Parties

The Meeting of the Parties is invited to note the preliminary Report on the Site Network for Migratory Waterbirds in the Agreement Area and take its tentative conclusions and recommendations into account in the decision making process.

# PRELIMINARY REPORT ON THE SITE NETWORK FOR WATERBIRDS IN THE AGREEMENT AREA, 1st EDITION

April 2012

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## GLOSSARY

AEWA - African-Eurasian Migratory Waterbird Agreement
CMS - Convention on Migratory Species
CSN - Critical Site Network
GEF - Global Environmental Facility
IBA - Important Bird Area
MOP - Meeting of the Parties
SPA - Special Protection Areas
UNEP - United Nations Environmental Programme
WDPA - World Database on Protected Areas
WOW - Wings Over Wetlands: the African-Eurasian Flyway Project

## Executive Summary

Paragraph 7.4 of the AEWA Action Plan requires the Agreement Secretariat to prepare a series of international reviews on the implementation of the Action Plan, including the report on the site network for waterbirds in the Agreement area. Until the creation of the Critical Site Network Tool, this task has not been reviewed by the previous MOPs.

This project used the information brought together in the Critical Site Network Tool together with updated information on the protection status of Critical Sites to assess what proportion of each waterbird population (listed in Table 1 of the AEWA Action Plan) was covered by the Critical Site Network. This was then compared with the coverage provided to the Critical Site Network by various site protection instruments.

The review concluded that 85% of the AEWA populations have at least one Critical Site identified for that population in either the breeding or non-breeding season, but only 61% have Critical Sites identified in both seasons (page 22). The proportion of AEWA populations covered by the Critical Site Network generally reflects their distribution patterns. Populations of various waterbird families tend to have higher coverage in the non-breeding season than in the breeding season, reflecting their general tendency to congregate in the non-breeding season and disperse when breeding. The exceptions to this pattern are herons *Ardeidae* and gulls and terns *Laridae* which breed colonially and tend to be more dispersed in the non-breeding season; consequently higher proportions of the populations within these families are covered by the Critical Site Network in the breeding season than in the non-breeding season. Families that are congregatory during both the breeding and non-breeding seasons have the highest coverage. These include the flamingos *Phoenicopteridae*, pelicans *Pelicanidae*, cranes *Gruidae* as well as ducks, geese and swans *Anatidae.* Families which have populations with more dispersed distribution in certain seasons tend to have a lower proportion of the population covered by the Critical Site Network in that season. Thick-knees *Burhiniidae* and divers *Gaviidae* have low coverage by the Critical Site Network throughout the year (Figure 6).

On average, the coverage of AEWA populations by various types of protected areas is only 55% of that covered by the Critical Site Network (Figure 16). 19 populations with a substantial proportion of their population in the Critical Site Network in at least one of the season (i.e. over 10%) are not covered by any protected areas in that season (Table 8 and Table 9).

This average coverage of the populations can be explained by the finding that only half of Critical Sites have most or all of their area designated (Figure 7). However, there are significant geographic differences; in North and Southwestern Europe as well as in Central Europe where the Birds Directive applies around two thirds of the Critical Sites have most or all of their area designated, while in Africa and Southwest Asia this applies to less than one third of the Critical Sites (Figure 8). Comprehensive and appropriate management plans have been reported from only 3% of the Critical Sites, 6% are reported to have management plans that are outdated or not comprehensive (Figure 13). Necessary management measures for the site are reportedly being implemented at only 1% of the Critical Sites, 8% of Critical Sites are reported to have substantive conservation measures and a further 5% has some limited conservation measures in place (Figure 14).

Almost two thirds of the Critical Sites identified are in Europe and only one third in the rest of the Agreement area, which strongly suggests that there might still be significant gaps in the identification of internationally important sites (Figure 11).

Most of the protected Critical Sites are covered by some kind of national designations. The most common international instrument under which Critical Sites are designated is the EU Birds Directive, followed by the Ramsar Convention. It is important to note, however, that 78% of the Ramsar Sites in overlap with Critical Sites have been designated in the three European AEWA subregions and overlap with SPAs (Figure 11). Despite the fewer sites being designated under the Ramsar Convention, it offers 'adequate' coverage for 68 AEWA populations in the breeding season and 172 in the non-breeding season, while the Birds Directive offers 'adequate' coverage for 43 and 107 populations respectively. This finding highlights that the conservation afforded by the Birds Directive is geographically limited and the conservation of flyway-scale protection of the Critical Site Network requires complementary instruments (Figure 28).

The identification of Critical Sites and the assessment of their conservation have been primarily based on population data and protected area information that is held in the international databases maintained by

BirdLife International, the UNEP World Conservation Monitoring Centre and Wetlands International. This information critically depends upon both regular national updates and data management capacity at international level to maintain up-to-date international overviews. Information concerning designation and management of site networks is sparse, highly dispersed in various datasets and was sometimes inaccessible to the project. Revisions by national experts were received only in minority of cases (see page 15).

Based on the above, the report makes the following recommendations:

### Improving coverage of AEWA populations by different designation types

1. Designation of the Critical Sites through national and international instruments could substantially increase the proportion of each AEWA population afforded some degree of protection.
2. Conservation measures focusing on important sites should be complemented with broad habitat conservation measures and it would be useful to develop habitat conservation strategies in Africa and Southwest Asia similar to those presented in the book *Habitats for Birds in Europe*[1].

### Addressing geographic information gaps in site identification, designation and management

3. Parties, Range States and other stakeholders should conduct gap filling surveys in poorly known areas, in particular which were identified during the subregional consultations conducted under the Wings Over Wetlands and WetCAP projects, to assess their international importance.
4. Gap filling surveys should focus initially on identifying key sites for globally threatened bird species not included into the Critical Site Network.
5. At the national level, increasing the proportion of Critical Sites with appropriate management and conservation measures in place would be of considerable benefit to AEWA populations.
6. Parties should develop and implement national action plans for filling gaps in designation and management of internationally important sites to make progress towards establishing a coherent flyway network by 2017. The prioritized country profiles presented in Annex 3, the Critical Site Network Tool, available wetland inventories and other appropriate sources of information could inform the development of such action plans. This activity would also contribute to reaching the long-term target set out under the 'Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance of the Convention on Wetlands'.
7. The WOW Partnership, that includes AEWA, BirdLife International, the Ramsar Convention, the UNEP World Conservation Monitoring Centre and Wetlands International, could provide assistance in developing such action plans and could increase management capacity able to address the specific ecological requirements of migratory waterbirds through the implementation of the Flyway Training Programme developed under the Wings Over Wetlands Project as a contribution to the Plan of Action for Africa.
8. A Plan of Action similar to the Plan of Action for Africa should be developed also for Southwest Asia.
9. Parties, acting as donors in international development co-operation should provide assistance to the establishment of a comprehensive and coherent flyway network of protected and managed sites that fulfill the joint objectives of AEWA, the Convention on Biodiversity, the Ramsar Convention on Wetlands and other international treaties.

### Improving data availability

10. Parties to AEWA should consider making reporting on designation, management planning and conservation action part of the national reporting process.
11. The WOW Partnership should make every effort to keep the Critical Site Network Tool up-to-date in order to provide decision-makers with key information to support their conservation planning.

[1] Tucker and Heath 1997. Habitats for Birds in Europe: a conservation strategy for the wider environment. BirdLife International, Cambridge, UK. (BirdLife Conservation Series No. 6)

12. Parties should implement monitoring schemes that monitor the state, pressure and responses at internationally important sites for waterbirds, maximising the synergies with the monitoring of sites designated under the Ramsar Convention and the EU Birds Directive.

## Acknowledgements

We would like to thank the AEWA Focal Points and BirdLife International partners and contacts who have contributed to checking, updating and improving the protection and other data on Critical Sites through this project. We are grateful for the use of protected area information from the World Database on Protected Areas and provision of additional protected area information from the secretariats of international instruments. The UNEP World Conservation Monitoring Centre has provided invaluable assistance to the project by hosting the Critical Site Network Tool.

We also gratefully acknowledge the many people who have volunteered their time and gathered the waterbird and site monitoring information upon which much of this analysis is based, through their contributions to the International Waterbird Census of Wetlands International and the Important Bird Area identification and monitoring process of BirdLife International.

## Introduction

Article IV of the Agreement text introduces the AEWA Action Plan, which is attached as Annex 3 to the Agreement. Paragraph 7.4 of the AEWA Action Plan requires the Agreement Secretariat in coordination with the Technical Committee and the Parties to prepare a series of seven international reviews on the implementation of the Action Plan. These reviews shall be prepared at different frequencies, as per paragraph 7.5, and shall be submitted to the Meeting for the Parties (MOP) for consideration.

Amongst these seven international reviews is the Report on the site network for waterbirds in the Agreement area. This matter has not been reviewed and presented to previous MOPs. The 3rd session of MOP3 in paragraph 6 of Resolution 3.11, requested the Technical Committee urgently to implement the international context reviews specified in paragraph 7.4 of the Action Plan which will provide future Meeting of Parties with context on these issues.

The purpose of the report is to provide the national administrative authorities of AEWA with a strategic overview of:

a) the knowledge of the extent and distribution of sites of international importance[2] for and used by each of the species on the Agreement;
b) the extent to which these sites of international importance are statutorily or otherwise designated under relevant international processes;
c) the extent to which internationally important sites are subject to directed management for the purposes of the conservation of the waterbirds for which they are internationally important; and
d) instances where populations of waterbirds depend on key unprotected sites of importance, the loss of which would be of significance for the population concerned (for example unprotected 'bottleneck' sites, or unprotected sites in migration corridors of restricted geographical extent).

The Terms of Reference for the review has defined the tasks as follows:
The contractor shall carry out a review to deliver the objectives above, in particular:

i) providing a brief introductory overview of the context of flyway-scale networks and their significance for migratory waterbird populations, including a brief synthesis from existing literature of the implications of key site loss for a small sample of migratory waterbirds (possible examples include Bewick's Swan, Red Knot and an African and/or quarry species);
ii) identifying, for each of the 235 species listed by the Agreement until 2008 and currently included into the Critical Site Network tool developed under the WOW project, the network of internationally important sites used (whether or not these are subject to protection) and accordingly the best estimate of the proportion of each flyway population using this network of sites of international importance;
iii) identifying which of the sites identified at i) above have national or international designations and accordingly the best estimate of the proportion of each flyway population protected at this network of designated sites;
iv) identifying which of the sites identified at ii) above have active and ongoing management measures or plans aimed at the conservation of the species which they have been identified for;
v) providing country profiles – a list of all identified sites in order of priority for tackling gaps in designation and management;
vi) assessing to what extent the existing site network is comprehensive and coherent;
vii) summarising key conclusions by geographic region and for each waterbird family in the form of key messages for AEWA Contracting Parties;
viii) making recommendations for additional means of addressing information gaps identified especially with respect to knowledge of sites of international importance; and
ix) assessing the coherence and comprehensiveness of existing international site networks in relation to the site network objectives of AEWA.

Information and conclusions of this review will assist Contracting Parties in planning and taking appropriate measures in order to address issues with the sites identified on their territory belonging to the network of

[2] Sites of international importance defined using the criteria for the identification of the Critical Site Network established under the UNEP-GEF AEWA Flyway (Wings Over Wetlands) Project in consultation with the AEWA Technical Committee:
(http://wow.wetlands.org/Portals/1/documents/communication/wow_csn_tool_flyer_june_2010.pdf)

sites of international importance for AEWA populations, such as gaps in statutory or other designations, including internationally and lack of adequate management. This will contribute to reaching target 1.2 of the AEWA Strategic Plan 2009-2017: "*A comprehensive and coherent flyway network of protected and managed sites, and other adequately managed sites, of international and national importance for waterbirds is established and maintained, while taking into account the existing networks and climate change*".

## Flyway-scale site networks and their significance for migratory waterbird populations

The preambles to the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) recognises "*...that migratory waterbirds are particularly vulnerable because they migrate over long distances and are dependent on networks of wetlands that are decreasing in extent and becoming degraded through non-sustainable human activities, as is expressed in the Convention on Wetlands of International Importance, especially as Waterfowl Habitat, 1971*". Therefore, the Agreement requires contracting parties to conserve internationally and nationally important sites for migratory waterbirds and encourages Contracting Parties *"... to give special protection to those wetlands which meet internationally accepted criteria of international importance"*.

## Why site networks are so important for migratory waterbirds?[3]

Many waterbird species travel vast distances, crossing hundreds or thousands of kilometres often across many countries and often several continents during their annual migration cycles between their breeding and non-breeding areas. Migration is a form of adaptation to seasonal environments that support the species ecological requirements only during certain periods and occur from the arctic tundra to tropical savannas all over the globe.

According to Weller[4], the functional requirements of the annual life cycle that often involve and may induce mobility include:

(i) meeting individual body maintenance requirements despite seasonal changes of climate and physiological requirements;
(ii) specific habitat requirements related to breeding, moulting or wintering;
(iii) obtaining essential nutrients for egg laying;
(iv) foraging for food for young on breeding areas;
(v) seeking isolation and protection during post-breeding moulting periods (especially for those species that become flightless);
(vi) locating areas rich in maintenance food during migration and wintering to replenish fat reserves.

Food supplies and habitat conditions vary most markedly in strongly seasonal environments and birds time their migration to be present during the periods of abundance of food or when habitat conditions matching their ecological requirements for the particular life cycle stage. Because various migratory bird species, or even different populations of the same species, have different adaptations to such seasonal changes, a large variety of migration strategies can be observed amongst waterbirds. In case of some populations, all individuals migrate every year (obligate migrants) while in case of some others individuals migrate only when conditions (e.g. food, weather) turn unfavourable to them (facultative migrants). In general, obligate migration occurs in populations whose food supplies in breeding areas are predictably absent in winter and all main aspects of the migration process is under firm internal control. Obligate migrants often leave their breeding areas well before food supplies collapse and while they have ample opportunity to accumulate body reserves for the journey. They also tend to migrate long distances. In case of facultative migrants the same individual may migrate in one year but not in others. However, many species tend to switch from obligate to facultative mode during their journeys. Arctic-nesting geese need to leave the Arctic before survival becomes impossible, but their movements become more variable in timing and extent once they reach suitable wintering areas. Species that exploit highly sporadic habitats or food resources show little or no year-to-year consistency in their movements. Such nomadic species are typically associated with wetlands in arid regions.

[3] This and the following chapter is largely based on Newton, I. (2008) *The migration ecology of birds.* Academic Press, London, UK. Further information and training materials are available in the Flyway Training Kit, which is available in English, French, Arabic and Russian at the WOW project's website: http://wow.wetlands.org/CAPACITYBUILDING/FLYWAYTRAININGPROGRAMME/WOWTrainingResources/tabid/1688/language/en-US/Default.aspx

[4] Weller, M. (1999) *Wetland Birds: Habitat Resources and Conservation Implications*. Cambridge University Press, Cambridge, UK

Contrary to most land-birds that are more dispersed throughout the year, waterbirds tend to congregate at least in some stages of their annual cycle. Many fish eating species breed colonially because of the benefits of colonial breeding in reducing the risk of predation either through selecting predator free breeding places and/or through fending off predators communally. Other waterbirds, however, are often dispersed during the breeding season, but may congregate at various stages of the non-breeding season. *Anatidae* species tend to moult in large flocks at predator free areas and Arctic geese often migrate north to their breeding areas to benefit from the presence of unexploited food resources. Several tern species also tend to concentrate at some moulting sites, such as the Black Tern *Chlidonias niger* on the Ijselmeer in the Netherlands.

Birds have developed a wide variety of strategies to complete the journey between their breeding and non-breeding areas. Some species migrate with active flight such as geese, swans, ducks and shorebirds. They use their fat reserves accumulated prior to the migration and replenished during the journey to enable the completion of the next phase of the journey. Some populations minimise the time spent on migration, which gives them the longest possible time to spend at the breeding, moulting or wintering site, but requires large fuel stores that permit long non-stop flights (time minimising strategy). This is a particularly useful adaptation if suitable stop over sites, like the large mudflats used by the Red Knot *Calidris canutus* and Bar-tailed Godwit *Limosa lapponica*. Populations of these species tend to be highly congregatory at the few suitable staging and wintering sites and are, therefore, highly sensitive to negative changes at these sites. The alternative strategy is to reduce transport costs by keeping fat loads small and flying only short distances, refuelling as necessary. This is an appropriate strategy wherewhere birds can stop and feed almost anywhere (energy minimising strategy). The Common Sandpiper *Actitis hypoleucos* and the Green Sandpiper *Tringa ochropus* are typical examples of this strategy. Species following this strategy tend to be less congregatory and consequently their populations are less sensitive to changes at individual sites, but will still be affected by widespread habitat changes.

Soaring birds, such as cranes, storks and pelicans, exploit thermal currents to gain height. This requires less energy than active flight. Therefore, these species are less dependent on feeding conditions at key sites along their migration route. However, soaring birds are more affected by the geography of their migration routes and entire populations might be forced through certain bottlenecks such as straits and passes around or through high mountains where they are highly vulnerable to some localised threats such as unsustainable exploitations, powerlines and windfarms.

The examples above illustrate that for stable populations of migratory waterbirds to be sustained, they require a series of patches of suitable habitats distributed appropriately between their breeding and wintering areas in a configuration that enables them to survive their annual journey in sufficiently good condition to breed successfully. There is considerable evidence that there are carry-over effects for individuals such that breeding success will be negatively impacted if they arrive on the breeding grounds in poorer condition.

As relatively high proportions of migratory waterbird populations congregate in a relatively small number of sites, conservation efforts targeting their key sites can substantially contribute to maintaining or restoring populations to favourable conservation status. Waterbird species that concentrate on a small number of sites might be highly vulnerable to habitat loss and factors that may cause mass mortality (e.g. through man-made threats such as unsustainable resource use, poorly-located or designed windfarms and powerlines, oil pollution, poisoning, botulism, etc.). The International Wader Study Group has developed a generic framework (Box 1) that can be also applied for other migratory waterbird populations to inform flyway-level conservation planning.

## What are the implications of losing key sites?

The growth of bird populations is limited by density dependent factors, i.e. available resources such as food and suitable breeding habitat and by density in-dependent factors such as predation, accidental mortality, etc.. In the case of a resident population uniformly distributed through an area of habitat, population declines would be expected to be roughly proportional to the area of habitat loss.

In the case of migrants, however, the situation is more complicated. The effect of habitat loss on the population would depend upon where in the migratory cycle population limitation was occurring. If the population was limited by factors operating on its wintering ground, the loss of winter habitat would cause a proportional reduction in population size. However, in this scenario, loss of breeding habitat might well have

no discernable effect on population numbers up to the point where a density-dependent decline in breeding success might set in. Likewise, if the population were limited by factors operating on the breeding grounds, loss of breeding habitat might cause a proportional decline in the breeding population, but loss of wintering habitats would have no effect.

Even for quite well studied species, research is often only conducted during one part of the migratory cycle. However the main conclusion from the model illustrated above is that knowledge of the response within just the breeding or wintering area is not sufficient to assess the effect of loss of habitat/ reduced food availability. Assessing the impact requires knowledge of factors operating in both breeding and non-breeding areas, the consequence of habitat or food loss being greatest for the season in which density dependence is greatest. It is important to note, however, that the above only applies if populations are limited by density dependent factors and not if the population is kept under carrying capacity by density-independent factors (e.g. additional mortality caused by human-induced threats). In that case, the limitation by the density independent factor may outweigh the importance of habitat loss.

Population levels can also be influenced by conditions experienced during migration, especially because migrating birds require more food than usual and therefore density dependent factors like competition are exacerbated on staging areas where individuals concentrate in large numbers during a restricted time period. The potential for population limitation on staging areas is especially high in case of waterbirds which have only a limited number of suitable refuelling sites in many regions. However, the quality of the stop-over sites depends not only on food availability, but also on factors that affect feeding such as predation, disturbance etc.

Events at stop-over or wintering sites may affect not only the birds' migratory performance, but also their subsequent reproduction and survival (carry-over effects) with potential population level consequences. Usually, individuals that arrive at the breeding areas earlier occupy the best habitats and show higher

**Box 1. Topics for which information is needed to put in place flyway-scale waterbird conservation**

**Basic biology**

a. Where are the sites used?
b. What is the ecology and population dynamics of the waterbird species?
c. What life-history characteristics influence how flyways are used by populations?
d. What role does each site play in the annual cycles of each species?
e. How is each site related to the usage of other sites in the flyway?
f. What features of each site determine how it is used?

**Threats and opportunities**

a. What pressures threaten continued usage of each site?
b. What are current constraints on site use by waterbirds?
c. How can be, and are, sites modified, and what are the consequences of these modifications?
d. How can this knowledge be best used to develop and implement flyway conservation programmes?

**Conservation actions**

a. What level of conservation law provision exists in different countries along a flyway?
b. How can this conservation law be used to deliver national actions and international co-operation?
c. How does site-based conservation fit into the broader needs of dispersed species?
d. How can the flyway conservation needs of waterbirds be linked with the sustainable use and development of their habitats?
e. How can conservation provision for waterbird flyways be enhanced, especially where weak?

breeding success while later arriving individuals are relegated to poorer habitats or may even fail to occupy a territory. In turn, the success of their breeding attempt may influence their performance their survival and speed during the subsequent migration to wintering areas. For example, female Brent Geese *Branta bernicla* that fed on high quality salt marshes in spring in the Netherlands accumulated more body fat and were more likely to return with young in the following autumn than those females that fed on less nutritious agricultural grasslands.

The flyway approach to the conservation of waterbirds recognises that waterbird populations are intimately affected by positive and negative changes at key sites across their entire flyway. Therefore, every range state has a unique responsibility to contribute to the maintenance or restoration of the favourable conservation status of migratory waterbird populations through ensuring any use of populations passing through their country is sustainable and by maintaining their habitats, including their key sites, in good condition.

# Methodology

## Identifying internationally important sites

Under the WOW project the latest available data in the databases of BirdLife International and Wetlands International were drawn together. In 2010, the internationally important sites for waterbird populations in the AEWA region were identified to support the implementation of AEWA and of the Ramsar Convention.

The criteria for identifying these internationally important sites (called Critical Sites under the WOW project) is based on the methodology of 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. The CSN Criteria were 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 breeding and non-breeding stages of the annual cycle).

A site was identified as 'critical' if it fulfils at least one of the two CSN criteria:

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.

Further detail of the criteria and methodology for applying them, along with definitions of terms can be found in the user guide of CSN Tool[5]. The CSN criteria will be applied periodically to the updated data held in Wetlands International and BirdLife's databases.

The analysis in this report is restricted to Critical Sites identified for those 235 species listed on AEWA Annex 2 at the inception of the WOW project. In addition to these 235 species, the CSN Tool contains data and Critical Sites for non-migratory and intra-continental migrant species which belong to a 'waterbird family' (as defined by the Ramsar Convention) that are primarily associated with wetland habitats (as defined by Ramsar) and occur within the AEWA area.

The CSN Tool covers the area within the geographic boundary of the Africa-Eurasian Migratory Waterbird Agreement (AEWA). The underlying data have been restricted by this boundary rather than by country boundaries so that where the AEWA boundary bisects a country, only information from those sites occurring within the boundary are included on the map or in the underlying data analysis.

## Calculating proportion of the population using the the Critical Site Network

Ideally, the true proportion of the population using a network of sites throughout their annual cycle could be estimated using data from synchronised counts from each stages of the annual cycle from all sites relevant in that stage. The international importance of a site for a population in a given season is usually estimated by dividing the size of the population at the site by the latest estimate of the size of the whole flyway or biogeographic population.

In reality, however, synchronised waterbird counts take place at flyway-scale only during the mid-winter counts under the International Waterbird Census, but the coverage of even that scheme is not yet constant in all countries over the years. Data available in international site inventories, such as the Important Bird Area books (that is stored in the WBDB), Ramsar Information Sheets (describing Ramsar Sites), Natura 2000 Standard Data Sheets (describing Special Protection Areas under the EU Birds Directive) contain only aggregated data (average, minimum and maximum) for several years and mostly collected in different years.

In addition, to assess the proportion of a population using the site network in various stages of the annual cycle, unambigous information on the functional use (e.g. breeding, moulting, staging, etc.) of the site would

[5] http://dev.unep-wcmc.org/csn/default.html#state=home

be also necessary. Unfortunately, the functional use of the site is not recorded consistently in the international datasets.

Furthermore, numbers are only available for populations qualifying a site as internationally important. Data on other species not occuring at the site in internationally important numbers are often not-recorded consistently. However, conservation measures are also usually directed towards the species the site has been selected for, as it is stipulated by the requirements of the Article 6 of the EU Habitats Directive also applicable for Special Protection Areas.

A related issue is that various populations of the same species may overlap at their breeding or wintering grounds, but it is often not possible to divide the numbers between the populations without further investigations. Therefore, birds in such overlapping populations were allocated to the population with the higher thresholds present at the site in the given season.

Using these approaches presents the following problems:
1. Site-level and population-level estimates do not necessary refer to the same time period.
2. Data from various stages during the 'non-breeding' season had to be lumped. The consequence of this that summing up the proportions of the populations at site level can result in multiple counting of the birds using a series of sites to reach their non-breeding grounds.
3. Similarly, birds may use different sites for breeding in different years and adding up the proportions at site level may result in overestimating the proportion of the population covered by the network.

Therefore, it was impossible to accurately estimate the proportion of populations using the site network based on the available data and within the available time and budget for this project. Instead, the approach was taken to present 'coverage' as an index of the population using the site network recognising that such an index reflects not only the proportion of the population using the site network, but also the 'connectivity' of the site network. The index has a higher value if there is a large number of sites the population occurs in qualifying number and if higher percentages of the birds occur at individual sites (Figure 1).

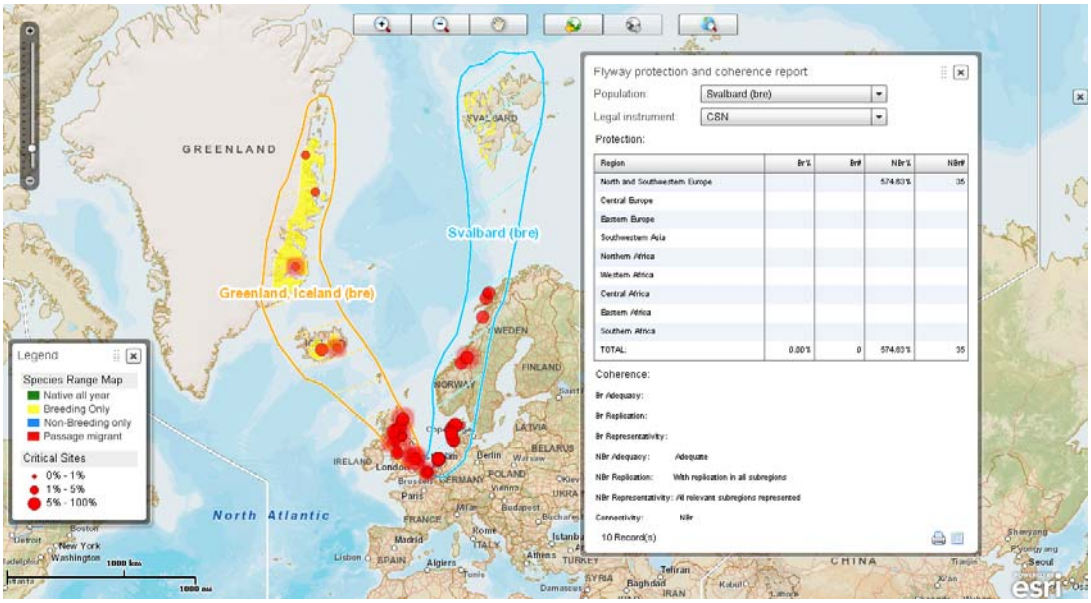



**Figure 1 The site network for Pink-footed Goose *Anser brachyrhynchus* illustrates that the Svalbard population concentrates on a series of staging sites in Norway and Denmark before reaching the wintering grounds in the Netherlands and Belgium. The map shows that each of these sites holds a significant (>5%) percentage of the population sequentially. However, the aggregated total coverage exceeds 500%, which is clearly biologically not realistic. However, it can be interpreted as an .**

Based on the considerations above the following method was used to calculate the proportion of the different populations using the Critical Site Network:
1. Numbers presented at each site were converted to individuals using a factor of three to convert data given in breeding pairs, territorial males or breeding females. Data for populations in lower

than the threshold at a Critical Sites were not included into the calculations of the coverage of the site networks because this data is not available uniformly across the AEWA region.

2. For the purpose of estimating the proportion of the population covered by the Critical Site Network in the non-breeding season, counts comprised all estimates of 'passage' and 'non-breeding'/ 'wintering' birds were aggregated into the 'non-breeding'. Estimates of populations considered 'resident' at Critical Sites were allocated to both breeding and non-breeding categories.
3. The proportions at site level were estimated by dividing the estimated size of the local population by the size of the flyway or biogeographic population provided in the 4th edition of the Waterbird Population Estimates.
4. Across the entire CSN for a population these percentage figures from individual Critical Sites were then summed to arrive at a figure for the percentage of the total population captured within the CSN in both breeding and non-breeding seasons.

## Gathering information on site designation and management

Information on site designation, management planning and conservation action were collected through the following steps:

1. Where possible, GIS layers were obtained from the World Database on Protected Areas (WDPA) and elsewhere for boundaries of sites covered by international designations (e.g. Ramsar Convention, Birds Directive etc.). These were overlaid against the Critical Sites for which site boundaries were available to provide a first cut of international designation information for Critical Sites, country by country. National designation information (from a previous GIS overlay and improved by BirdLife International national partners) held in the BirdLife World Bird Database was also overlaid with the Critical Sites to provide a first cut of national designation information for Critical Sites.
2. In order to improve on this and to obtain further national – level information on designation, management and action at Critical Sites, the results of step 1 were sent to AEWA Focal Points and BirdLife Partners for all countries in which Critical Sites had been identified. The information was sent in the form of a 'questionnaire' approved by the AEWA Technical Committee, along with guidance and background information.
3. The information supplied by AEWA Focal Points and BirdLife Partners was checked, clarified with respondents where necessary, and incorporated into the WBDB. The data were then supplied to the programmer, Andrew Cottam, for incorporation into the CSN Tool and generation of data tables for analysis.

The response rate to the questionnaire was relatively low from AEWA Focal Points and higher from BirdLife Partners and contacts.

Questionnaires were sent to the AEWA Focal Points of 99 countries, in which Critical Sites had been identified, and 64 BirdLife partners or other BirdLife country contacts in the AEWA region. Contributions were received from 11 AEWA Focal Points or government contacts and 26 BirdLife Partners or contacts (Table 1). A number of reminders were sent and there was ongoing dialogue with many respondents to try to address any inconsistencies in the data.

**Table 1 AEWA Focal Point and BirdLife International partner contributions to checking/ updating country site protection information.**

| **Country contributions to checking/ updating protection information received from:** | |
|---|---|
| **BirdLife Partner or contact** | **AEWA Focal Point or government contact** |
| Botswana | Croatia |
| Bulgaria | Denmark |
| Burundi | Egypt |
| Canada | Estonia |
| Cyprus | Ghana |
| Denmark | Macedonia |
| Ghana | Namibia |
| Greece | Netherlands |
| Greenland (to Denmark) | Poland |
| Iran, Islamic Republic of | Slovakia |
| Iraq | Ukraine |
| Ireland | |
| Jordan | |

| | |
|---|---|
| Kazakhstan | |
| Kenya | |
| Montenegro | |
| Nigeria | |
| Russia | |
| Slovenia | |
| South Africa | |
| Switzerland | |
| United Republic of Tanzania | |
| Turkey | |
| Uganda | |
| Uzbekistan | |
| Zambia | |

## Data quality

Given the relatively low number of responses to the request for checking/ updating the national information, for many countries the analysis conducted will be based on existing information, which may be out-of-date or contain inaccuracies. In particular where no information was available on site designation, the analysis will be reliant on the GIS overlay of protected area boundaries from the WDPA with Critical Site boundaries. Any inaccuracies in the recorded geographic location or lack of availability of digitised site boundaries is likely to result in inaccuracies, such as sites appearing to be undesignated when in fact designations do apply.

The identification of Critical Sites upon which this analysis is based took place in 2010 and this list will be reassessed at least at 4 yearly intervals, with updates of other underlying data layers annually. It is possible therefore that countries may have more up-to-date information than currently appears in the CSN Tool and therefore in this analysis. The process of update relies upon new information on sites or populations being submitted to Wetlands International as part of the International Waterbird Census or Birdlife International as part of the IBA update process. Once submitted the data must go through a number of checks and processes before being incorporated in the databases of Wetlands International or BirdLife which provide the source of the data in the CSN Tool; some delay is therefore to be expected before updated information is available in the CSN Tool.

## Calculating designation statistics

For some analyses it was necessary to calculate the percentage of the population covered by protected areas. In these cases, the assumption was made that the proportion of the population covered by designation at a site was proportional to the area of that site falling under designation. In this way, if the mean number of individuals recorded at a site was 80, and half of the site was designated, we would assume that 40 individuals were covered by designation.

For analyses requiring the number of sites in a protected area network, a 50% cut off was used such that if more than 50% of a Critical Site is covered by the particular form of designation it is considered designated, if less than 50% it is considered undesignated.

Of course neither method above is ideal given that waterbird populations are unlikely to be uniformly distributed throughout a Critical Site. One could also argue that more, or less conservative thresholds could be used for considering a site designated. It is important to be aware of these methodologies when interpreting some of the results. For example use of a 50% cut-off in some of the designation analysis means that it is possible for a population to be, for example, 10% covered by designation (under analyses using method a), yet appear to have no designated sites (under analyses using method b). In reality numbers of birds might occur at 20 different sites, all of which are less than 50% designated. These are compromise methodologies, but they have the advantage that they can be consistently applied to what is a very large data-set, in the absence of more detailed information.

## Prioritizing sites for filling gaps in designation and management

The AEWA Strategic Plan also aims to improve the conservation status of waterbirds and their populations by establishing and maintaining a comprehensive and coherent network of protected and managed sites of international and national importance. For practical data availability reasons, this review focuses only on sites that meet the criteria for the Critical Sites, which forms the most important subset of all internationally important sites. Although, eventually, all Critical Sites should be designated and properly managed, it is usually not possible to designate and set up a management regime for all of them at the same time. Some sites might already be adequately protected and managed, while others might still remain insufficiently designated or protected.

Under this project country profiles were developed to highlight gaps in designation and management of Critical Sites. The aim of prioriting Critical Sites was to assist countries in addressing these gaps in order of the conservation importance of the site. but eventually all Critical Sites should ideally be designated and have adequate conservation and management measures in place. It should be noted that comparison of this information across countries is unlikely to be informative, because of variability in availability of information.

A prioritization method which aims to assist the improvement of the conservation status of waterbird populations covered by AEWA should consider the following factors:

- *Irreplaceability* of the site. The irreplaceability (or uniqueness) of a site is the degree to which spatial options for conservation are lost if the site and its biodiversity are lost. Sites that hold the entire population of one or more species would have a higher irreplaceability than sites that hold only a few individuals of an otherwise widely distributed species. Hence, the summed proportion of populations qualifying the site indicates well its irreplaceability.
- *Vulnerability of the population*. This concerns the extinction risk of the populations and it is inversely related to the favourable conservation status of the population, i.e. the ultimate aim of AEWA. In the context of the Agreement, the vulnerability of a population is expressed through its listing in Table 1 of the AEWA Action Plan.
- *Vulnerability of the site*. It concerns the risk of diminishing capacity of the site to support the species dependent on it. Unfortunately, site vulnerability is a dynamically changing attribute of the site and there is only insufficient data available to measure it objectively. However, *site designation and management* is a strategy required by the AEWA Action Plan to address vulnerability proactively, by addressing risks through regulation of human activities and through active management activities.

A score can be calculated for each site using Equation (1) below, which takes into account (i) the gaps in designation and management, (ii) the irreplaceability of the site and (iii) the vulnerability of the populations it is important for:

(1) $$P_k = R_k \cdot \sum \left( \frac{n_{ik}}{N_i} \cdot W_i \right)$$

Where:

$P_k$: is the priority score for the site $k$;
$R_k$: is the inverted response score for the site $k$ (see proposed values in Table below);
$n_i$: is the number of individuals of population $i$ at site $k$;
$N_i$: is the size of population $i$ according to the Waterbird Population Estimate 4;
$W_i$: is the weight for population $i$ based on its conservation status (see proposed weight values in Table below);

A higher priority score should represent a site with higher conservation value and with less satisfactory designation and management. Sites with satisfactory designation and management would have a priority score of 0 (regardless of their conservation value), indicating that they are not a priority for filling gaps in this respect. It is expected that, if designation and management of Critical Sites improves, more and more sites will receive a 0 score, i.e. cease to be priority for filling gaps. On the other hand, the system also can detect and highlight situations when the situation deteriorates, e.g. management plans become out of date or when resource or capacity limitations negatively affect site management[6]. The equation would highlight the importance of those sites which have little or no conservation measures, but hold large proportions of several populations. Everything else being equal, sites important for more vulnerable populations would have a higher ranking than the ones for less vulnerable populations.

**Box 2. Scoring conservation response in the IBA monitoring framework**

Three complementary measures of response – the levels of (1) formal designation for conservation, (2) management planning and (3) implementation of conservation action (see Note 13) – are scored, as follows:

| **Conservation designation** | **Score** |
|---|---|
| Whole area of IBA covered by appropriate conservation designation (>90%) | 3 |
| Most of IBA covered (including the most critical parts for the trigger species) (50–90%) | 2 |
| Some of IBA covered (10–50%) | 1 |
| Little/none of IBA covered (<10%) | 0 |

| **Management planning** | **Score** |
|---|---|
| A comprehensive and appropriate management plan exists that aims to maintain or improve the populations of qualifying species | 3 |
| A management plan exists but it is out of date or not comprehensive | 2 |
| No management plan exists but the management planning process has begun | 1 |
| No management planning has taken place | 0 |

| **Conservation action** | **Score** |
|---|---|
| The conservation measures needed for the site are being comprehensively and effectively implemented | 3 |
| Substantive conservation measures are being implemented but these are not comprehensive and are limited by resources and capacity | 2 |
| Some limited conservation initiatives are in place (e.g. action by LCGs) | 1 |
| Very little or no conservation action is taking place | 0 |

The IBA is assigned an overall response status score based on the summed status scores for the three different action types as follows:

| **Summed action scores** | **IBA action status score & its description** |
|---|---|
| 8–9 | 3 High |
| 6–7 | 2 Medium |
| 2–5 | 1 Low |
| 0–1 | 0 Negligible |

Calculating response scores is based on the response score of the IBA Monitoring methodology (see Box 2) which is far the simplest and least demanding system measuring protected area efficiency. As Box 2 shows, more conservation measures would result in higher scores. Hence, using the response scores in their original form would not result in an index with the desired properties. To this end, we assign to each score their inverted value see Table 2.

**Table 2 Conversion of response scores to inverse response scores**

| Response score | Description | Inverted response score |
|---|---|---|
| 3 | High | 0 |
| 2 | Medium | 1 |
| 1 | Low | 2 |
| 0 | Negligible | 3 |

Assigning 0 value to sites with a High level of response ensures that they will be not listed as priority sites for gap filling and will appear at the bottom of the list with a priority score 0.000.

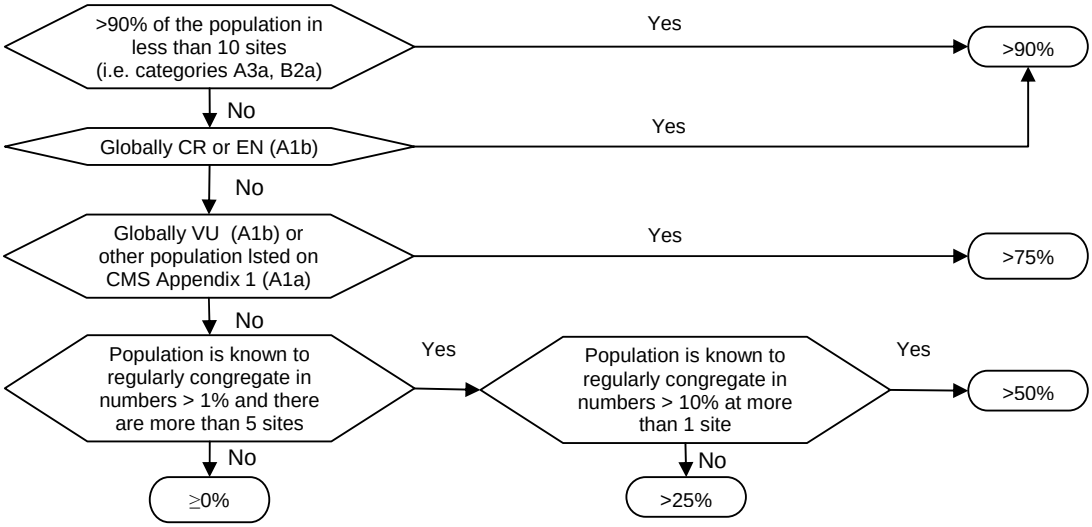
[6] At times of financial crisis, when budget cuts are expected to have an impact of site management, the formula can also inform national decision-making processes in identifying sites where cuts would have the most significant impact.

**The weighting factor ($W_i$) in the equation ensures that higher priority is given to populations with less favourable conservation status in AEWA Table 1, see**
Table 3. Such weighting would ensure that populations listed on Appendix 1 of CMS, of globally threatened species and very small populations would get a higher priority than larger populations and follow the logic of Table 1 of the AEWA Action Plan.

**Table 3 Weighting factors according to the conservation status of the population**

| AEWA Table 1 category | Weighting factor |
|---|---|
| A1a | 4 |
| A1b | 4 |
| A1c | 4 |
| A2 | 3 |
| A3 | 3 |
| B1 | 2 |
| B2 | 2 |
| C1 | 1 |

The remaining part of the formula ensures that the proportion of the populations occurring at the site is also taken into account in the prioritisation process. A worked example is presented in Annex 1.




## Assessing comprehensiveness and coherence of the site network

Owing to the limitations of data availability in order to assess comprehensiveness and coherence of the site network, the Critical Sites were used as a benchmark against which to compare other existing international site networks such as the Ramsar Sites, Special Protection Areas, etc.
Assessment of network coherence focused on the following elements:

- *Adequacy*: i.e. what proportion of the network is covered by the Critical Site Network (coverage) and how much of this is actually under various protection regimes. To reflect the specific conservation objectives of AEWA the assessment of adequacy takes into account the following factors:
    - the *congregatory* nature of the population: i.e. the less congregatory a population the lower relative coverage (by the CSN/ protection) is needed because (a) fewer sites would meet the criteria for international importance and (b) a larger proportion of the population would use nationally important sites and habitat networks in the wider countryside.
    - the *vulnerability* of the population: i.e. the more vulnerable a population the more important it would be that suitable networks of sites and habitats are maintained and protected and the population is more likely to be already restricted in its distribution. Hence, site-based conservation can be considered more appropriate. It should be noted that population size is already being considered as a factor of vulnerability in Table 1 of the AEWA Action Plan.
- **Figure 2 Thresholds for assessing the adequacy of coverage considering vulnerability and congregatory nature of the population.**

When assessing adequacy, population coverage was aggregated for each of the breeding and non-breeding seasons. Owing to the fact that populations may move between breeding, stop-over or non-breeding sites depending on temporary conditions or during their migratory journey, the resulting figures should be interpreted as indices of geographic concentration of the population in the site network rather than an accurate estimate of the coverage of the population by the site network in a given season. We suggest using the thresholds presented in Figure 2 to decide whether there are substantial gaps in the CSN itself or in designation. It is important to emphasise that this process only aims at assessing the coherence of the benchmark and it does not affect the expectation that Critical Sites are being considered as a minimum set of sites that meet the conditions for the application of to Article 3.2.2 of the AEWA Action Plan.

*Connectivity*: i.e. the extent to which the network includes sites in all those stages of the annual cycle when the site based approach is appropriate. For the matter of simplicity, it has been assumed that the definitions of the AEWA populations provide an adequate framework because sites within the range of the same population are connected to some degree and there is no need for finer assessment of connectivity at this stage. Because of data limitations, the seasonal use of sites will be assessed in breeding and non-breeding seasons.

- *Replication*: this provides a (crude) measure of resilience of the network, based on the assumption that populations are less vulnerable if there are multiple sites protected for the population in a given

season. Number of sites can be obtained from the dataset. Because there is no objective methodology to define how much replication would be sufficient, we will only highlight those populations where there is no replication. Because the CSN has been used as a baseline, a region was assessed for replication if at least one CSN site has occurred in it.

- *Representativity*: i.e. the extent to which the geographic variation in the population is captured in the site network. Again, the CSN was used as baseline and subregions with at least one Critical Sites were to be assessed whether they are represented in the given protected area network.

Results of the analysis for each designation type (i.e. CSN as benchmark, all designation types together, Ramsar Site, SPA, OSPAR, HELCOM, national designations) are summarised for each population on the Critical Site Network Tool and it facilitates generation of summaries at the level of populations or by flyways.

# Results

## Network of internationally important sites for waterbird populations covered by the Agreement

There have been 3,047 Critical Sites identified by the WOW Project in 2010 (Figure 3).

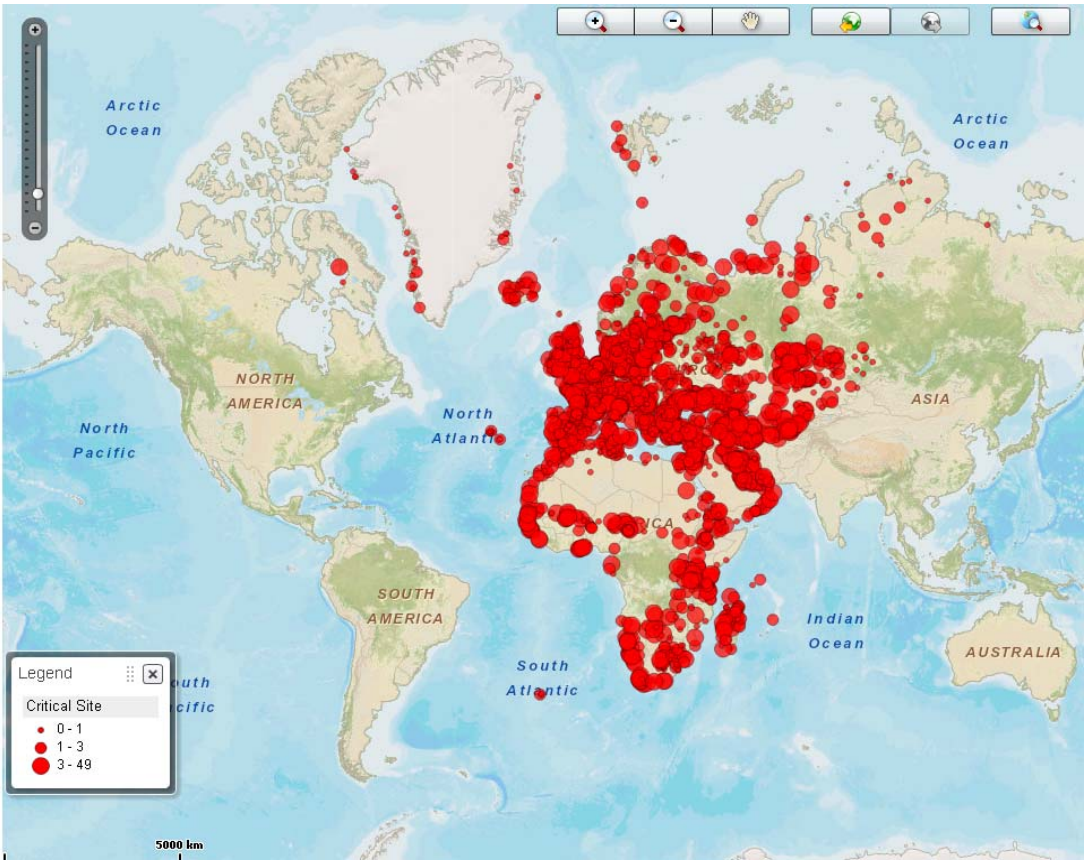



**Figure 3 Critical Sites identified in 2010 for populations listed on Table 1 of the AEWA Action Plan**

## Coverage of AEWA populations by the Critical Site Network

Annex 2 presents the total coverage for each AEWA population by the Critical Site Network and by various national and international designation types.

The Critical Site Network includes qualifying sites for 357 AEWA populations (68%) in the breeding season and 421 populations (80%) during the non-breeding season. The Critical Site Network covers 454 populations (85%) at least one of the seasons and 324 (61%) populations are covered by qualifying sites in both seasons.

Populations that do not have qualifying Critical Sites in any of the seasons are listed in Table 4. Many of these species are dispersed throughout the year, e.g. the Jack Snipe *Lymnocryptes minimus* or the Woodcock *Scolopax rusticola*. Some of the species concerned are congregatory in the non-breeding season, but a smaller population may winter in the same area as a larger conspecific population and the sites have been assigned to the larger population. A good example for this is the Greenland population of Dunlin *Calidris alpina arctica.* However, there are also genuine knowledge gaps such as in case of the Eastern African population of Grey Crowned-crane *Balearica regulorum*, which was only listed as Vulnerable in 2009 and sites qualifying under the lower threshold associated with this listing are yet to be identified. Although Critical Sites have not been identified specifically for the populations in Table 4, many of them do occur in

Critical Sites identified for other populations in numbers that do not meet the CSN criteria for being internationally important. However, as already mentioned in the Methodology section, no comprehensive dataset is available to estimate the coverage of the network for non-trigger species. Thus, the assessments in this report somewhat underestimate the overall coverage of the populations. However, this approach can be justified by the fact that under some conservation instruments (e.g. the EU Birds Directive) conservation measures are linked to the species for which the site has been designated.

Table 5 lists 97 populations that have no Critical Sites in the breeding season, but have qualified non-breeding sites. Many of these populations are either dispersed during the breeding season or have very high 1% thresholds that exceed the size of the largest known colonies. However, there are also populations with important knowledge gaps as in case of the Siberian Crane *Grus leucogeranus,* the West African population of the Lesser Flamingo *Phoeniconaias minor* or the populations of the Grey and Black Crowned-cranes *Balearica regulorum and B. pavonina* listed below.

Table 6 lists 33 populations which do not qualify any Critical Sites in the non-breeding season but do qualify in the breeding season. Typically, this group includes populations of gulls and terns that breed colonially and disperse to seaa during the non-breeding season, but it also includes populations that overlap with larger populations in the non-breeding season, e.g. the Turkish populations of the Common and Demoiselleie Cranes *Grus grus* and *G. virgo* and populations with significant knowledge gaps.

## Table 4 AEWA populations not qualifying any Critical Sites

*Gavia stellata*, Caspian, Black Sea & East Mediterranean (win)
*Gavia arctica suschkini*, Central Siberia/Caspian
*Egretta gularis schistacea*, North-east Africa & Red Sea
*Ixobrychus sturmii*, Sub-Saharan Africa
*Ixobrychus minutus payesii*, Sub-Saharan Africa
*Ixobrychus minutus minutus*, C & E Europe, Black Sea & E Mediterranean/Subsaharan Africa
*Ixobrychus minutus minutus*, West & South-west Asia/Sub-Saharan Africa
*Nycticorax nycticorax nycticorax*, Sub-Saharan Africa & Madagascar
*Ardea melanocephala*, Sub-Saharan Africa
*Ardea cinerea cinerea*, West & South-west Asia (bre)
*Ardea cinerea cinerea*, Sub-Saharan Africa
*Ciconia ciconia ciconia*, Southern Africa
*Clangula hyemalis*, Iceland & Greenland
*Anas hottentota*, Lake Chad Basin
*Thalassornis leuconotus leuconotus*, West Africa
*Alopochen aegyptiacus*, West Africa
*Anas capensis*, Lake Chad basin
*Balearica regulorum gibbericeps*, Eastern Africa (Kenya to Mozambique)
*Rallus aquaticus korejewi*, Western Siberia/South-west Asia
*Gallinula chloropus chloropus*, Europe & North Africa
*Gallinula chloropus chloropus*, West & South-west Asia
*Aenigmatolimnas marginalis*, Sub-Saharan Africa
Sarothrura boehmi, Central Africa
*Crecopsis egregia*, Sub-Saharan Africa
*Sarothrura elegans elegans*, NE, Eastern & Southern Africa
*Rallus caerulescens*, Southern & Eastern Africa
*Sarothrura elegans reichenovi*, S West Africa to Central Africa
*Burhinus senegalensis senegalensis*, West Africa
*Burhinus senegalensis inornatus*, North-east & Eastern Africa
*Pluvianus aegyptius aegyptius*, West Africa
*Glareola nuchalis liberiae*, West Africa
*Glareola cinerea cinerea*, SE West Africa & Central Africa
*Pluvianus aegyptius aegyptius*, Eastern Africa
*Pluvianus aegyptius aegyptius*, Lower Congo Basin
*Gallinago media*, Western Siberia & NE Europe/South-east Africa
*Lymnocryptes minimus*, Western Siberia/SW Asia & NE Africa
*Lymnocryptes minimus*, Northern Europe/S & W Europe & West Africa
*Numenius phaeopus alboaxillaris*, South-west Asia/Eastern Africa
*Numenius phaeopus phaeopus*, West Siberia/Southern & Eastern Africa
*Numenius arquata suschkini*, South-east Europe & South-west Asia (bre)
*Tringa nebularia*, Western Siberia/SW Asia, E & S Africa
*Tringa ochropus*, Northern Europe/S & W Europe, West Africa
*Tringa ochropus*, Western Siberia/SW Asia, NE & Eastern Africa
*Calidris alpina arctica*, NE Greenland/West Africa
*Calidris maritima maritima*, NE Canada & N Greenland (breeding)
*Gallinago stenura*, Northern Siberia/South Asia & Eastern Africa
*Scolopax rusticola*, Western Siberia/South-west Asia (Caspian)
*Scolopax rusticola*, Europe/South & West Europe & North Africa
*Tringa hypoleucos*, West & Central Europe/West Africa
*Charadrius dubius curonicus*, West & South-west Asia/Eastern Africa
*Vanellus lugubris*, Southern West Africa
*Vanellus leucurus*, Central Asian Republics/South Asia
*Vanellus superciliosus*, West & Central Africa
*Vanellus coronatus xerophilus*, South-west Africa
*Vanellus coronatus coronatus*, Central Africa
*Pluvialis apricaria altifrons*, Northern Siberia/Caspian & Asia Minor
*Vanellus lugubris*, Central & Eastern Africa
*Pluvialis fulva*, North-central Siberia/South & SW Asia, NE Africa
*Vanellus senegallus solitaneus*, South-west Africa
*Vanellus senegallus senegallus*, West Africa
*Vanellus albiceps*, West & Central Africa
*Charadrius marginatus mechowi/tenellus*, Inland East & Central Africa
*Charadrius marginatus mechowi*, West Africa
*Charadrius forbesi*, Western & Central Africa
*Charadrius tricollaris tricollaris*, Southern & Eastern Africa
*Vanellus coronatus coronatus*, Eastern & Southern Africa
*Sterna anaethetus melanopterus*, W Africa
*Sterna anaethetus antarctica*, S Indian Ocean

## Table 5 AEWA populations for which Critical Sites have only been identified in the non-breeding season

*Gavia adamsii*, Northern Europe (win)
*Gavia stellata*, North-west Europe (win)
*Tachybaptus ruficollis ruficollis*, Europe & North-west Africa
*Ardea purpurea purpurea*, Tropical Africa
*Ardea purpurea purpurea*, East Europe & South-west Asia/Sub-Saharan Africa
*Bubulcus ibis ibis*, Southern Africa
*Ardeola rufiventris*, Tropical Eastern & Southern Africa
*Ciconia nigra*, Central & Eastern Europe/Sub-Saharan Africa
*Ciconia abdimii*, Sub-Saharan Africa & SW Arabia
*Ciconia ciconia ciconia*, Central & Eastern Europe/Sub-Saharan Africa
*Leptoptilos crumeniferus*, Sub-Saharan Africa
*Plegadis falcinellus falcinellus*, Sub-Saharan Africa (bre)
*Threskiornis aethiopicus aethiopicus*, Iraq & Iran
*Phoeniconaias minor*, West Africa
*Phoenicopterus roseus*, Eastern Africa
*Mergellus albellus*, Western Siberia/South-west Asia
*Sarkidiornis melanotos melanotos*, Southern & Eastern Africa
*Nettapus auritus*, West Africa
*Anas capensis*, Southern Africa (N to Angola & Zambia)
*Anas erythrorhyncha*, Eastern Africa
*Anas erythrorhyncha*, Madagascar
*Anas hottentota*, Eastern Africa (south to N Zambia)
*Aythya fuligula*, Western Siberia/SW Asia & NE Africa
*Aythya marila marila*, Western Siberia/Black Sea & Caspian
*Melanitta nigra nigra*, W Siberia & N Europe/W Europe & NW Africa
*Dendrocygna bicolor*, West Africa (Senegal to Chad)
*Bucephala clangula clangula*, North-west & Central Europe (win)
*Plectropterus gambensis gambensis*, West Africa
*Alopochen aegyptiacus*, Eastern & Southern Africa
*Bucephala clangula clangula*, Western Siberia/Caspian
*Oxyura maccoa*, Eastern Africa
*Dendrocygna bicolor*, Eastern & Southern Africa
*Plectropterus gambensis gambensis*, Eastern Africa (Sudan to Zambia)
*Dendrocygna viduata*, Eastern & Southern Africa
*Cygnus olor*, North-west Mainland & Central Europe
*Cygnus columbianus bewickii*, Northern Siberia/Caspian
*Anser albifrons albifrons*, Northern Siberia/Caspian & Iraq
*Plectropterus gambensis niger*, Southern Africa
*Dendrocygna viduata*, West Africa (Senegal to Chad)
*Anser albifrons albifrons*, Western Siberia/Central Europe
*Anser anser anser*, NW Europe/South-west Europe
*Anser brachyrhynchus*, Svalbard/North-west Europe
*Balearica pavonina ceciliae*, Eastern Africa (Sudan to Uganda)
*Grus grus*, Western Siberia/South Asia
*Grus leucogeranus*, Iran (win)
*Balearica pavonina pavonina*, West Africa (Senegal to Chad)
*Balearica regulorum regulorum*, Southern Africa (N to Angola & S Zimbabwe)
*Sarothrura ayresi*, Southern Africa
*Amaurornis flavirostris*, Sub-Saharan Africa
*Porphyrio alleni*, Sub-Saharan Africa
*Gallinula angulata*, Sub-Saharan Africa
*Himantopus himantopus himantopus*, Sub-Saharan Africa (excluding south)
*Recurvirostra avosetta*, Eastern Africa
*Glareola nuchalis nuchalis*, Eastern & Central Africa
*Glareola ocularis*, Madagascar/East Africa
*Calidris canutus islandica*, NE Canada & Greenland/Western Europe
*Limosa lapponica taymyrensis*, Western Siberia/West & South-west Africa
*Limosa lapponica lapponica*, Northern Europe/Western Europe
*Calidris minuta*, N Europe/S Europe, North & West Africa
*Arenaria interpres interpres*, West & Central Siberia/SW Asia, E & S Africa
*Limosa lapponica menzbieri*, Central Siberia/South & SW Asia & Eastern Africa
*Philomachus pugnax*, Northern Siberia/SW Asia, E & S Africa
*Calidris ferruginea*, Western Siberia/West Africa
*Calidris alpina schinzii*, Iceland & Greenland/NW and West Africa
*Calidris canutus canutus*, Northern Siberia/West & Southern Africa
*Gallinago gallinago faeroeensis*, Iceland, Faroes & Northern Scotland/Ireland
*Calidris tenuirostris*, Eastern Siberia/SW Asia & W Southern Asia
*Tringa totanus ussuriensis*, Western Asia/SW Asia, NE & Eastern Africa
*Numenius phaeopus islandicus*, Iceland, Faroes & Scotland/West Africa
*Calidris alpina centralis*, Central Siberia/SW Asia & NE Africa
*Tringa erythropus*, Western Siberia/SW Asia, NE & Eastern Africa
*Tringa hypoleucos*, E Europe & W Siberia/Central, E & S Africa
*Tringa totanus robusta*, Iceland & Faroes/Western Europe
*Tringa totanus totanus*, Northern Europe (breeding)
*Tringa stagnatilis*, Eastern Europe/West & Central Africa
*Tringa nebularia*, Northern Europe/SW Europe, NW & West Africa
*Charadrius leschenaultii crassirostris*, Caspian & SW Asia/Arabia & NE Africa
*Pluvialis squatarola*, C & E Siberia/SW Asia, Eastern & Southern Africa
*Vanellus spinosus*, Black Sea & Mediterranean (bre)
*Vanellus vanellus*, Europe/Europe & North Africa
*Eudromias morinellus*, Asia/Middle East
*Charadrius asiaticus*, SE Europe & West Asia/E & South-central Africa
*Charadrius leschenaultii leschenaultii*, Central Asia/Eastern & Southern Africa
*Vanellus melanopterus minor*, Southern Africa
*Charadrius mongolus pamirensis*, West-central Asia/SW Asia & Eastern Africa
*Charadrius marginatus mechowi*, Coastal E Africa
*Charadrius pallidus venustus*, Eastern Africa
*Charadrius pecuarius pecuarius*, Southern & Eastern Africa
*Charadrius pecuarius pecuarius*, West Africa
*Charadrius hiaticula psammodroma*, Canada, Greenland & Iceland/W & S Africa
*Pluvialis apricaria altifrons*, Iceland & Faroes/East Atlantic coast
*Charadrius dubius curonicus*, Europe & North-west Africa/West Africa
*Rynchops flavirostris*, Coastal West Africa & Central Africa
*Sterna hirundo hirundo*, Western Asia (bre)
*Sterna vittata vittata*, P.Edward, Marion, Crozet & Kerguelen/South Africa
*Sterna saundersi*, W South Asia, Red Sea, Gulf & Eastern Africa
*Chlidonias hybridus sclateri*, Eastern Africa (Kenya & Tanzania)

## Table 6 AEWA populations for which Critical Sites have been identified only in the breeding season

*Podiceps grisegena grisegena*, Black Sea & Mediterranean (win)
*Botaurus stellaris capensis*, Southern Africa
*Botaurus stellaris stellaris*, South-west Asia (win)
*Botaurus stellaris stellaris*, C & E Europe, Black Sea & E Mediterranean (bre)
*Ardeola ralloides ralloides*, C & E Europe/Black Sea & E Mediterranean (bre)
*Ardeola ralloides ralloides*, West & South-west Asia/Sub-Saharan Africa
*Platalea leucorodia major*, Western Asia/South-west & South Asia
*Somateria mollissima borealis*, Svalbard & Franz Joseph (bre)
*Grus grus*, Turkey & Georgia (bre)
*Grus virgo*, Turkey (bre)
*Porzana parva parva*, Western Eurasia/Africa
*Crex crex*, Europe & Western Asia/Sub-Saharan Africa
*Sarothrura ayresi*, Ethiopia
*Rallus aquaticus aquaticus*, Europe & North Africa
*Glareola pratincola pratincola*, SW Asia/SW Asia & NE Africa
*Gallinago gallinago gallinago*, Europe/South & West Europe & NW Africa
*Gallinago media*, Scandinavia/probably West Africa
*Gallinago gallinago gallinago*, Western Siberia/South-west Asia & Africa
*Calidris alpina schinzii*, Baltic/SW Europe & NW Africa
*Phalaropus fulicarius*, Canada & Greenland/Atlantic coast of Africa
*Vanellus gregarius*, Central Asian Republics/NW India
*Sterna paradisaea*, Western Eurasia (bre)
*Larus hyperboreus hyperboreus*, Svalbard & N Russia (bre)
*Larus glaucoides glaucoides*, Greenland/Iceland & North-west Europe
*Larus fuscus intermedius*, S Scandinavia, Netherlands, Ebro Delta, Spain
*Xema sabini sabini*, Canada & Greenland/SE Atlantic
*Sterna vittata tristanensis*, Tristan da Cunha & Gough/South Africa
*Sterna anaethetus fuligula*, Red Sea, E Africa, Persian Gulf, Arabian Sea to W India
*Sterna fuscata nubilosa*, Red Sea, Gulf of Aden, E to Pacific
*Chlidonias hybridus hybridus*, Caspian (bre)
*Anous stolidus plumbeigularis*, Red Sea & Gulf of Aden
*Anous tenuirostris tenuirostris*, Indian Ocean Islands to E Africa
*Larus ichthyaetus*, Black Sea & Caspian/South-west Asia

Figure 4 shows the number and proportion of AEWA populations, by waterbird families, which are included into (or covered by) the CSN in the breeding season. The families that have the highest proportion of their populations within the Critical Site Network include four families that are represented only by a single population each. Amongst the families with more populations, the proportion of the populations with qualifying sites in the CSN is the highest in cormorants *Phalacrocoracidae*, pelicans *Pelecanidae,* oystercatchers *Haematopodidae*, grebes *Podicipedidae*, gulls and terns *Laridae* as well as in ibises and spoonbills *Threskiornithidae*. However, no sites qualify for thick-knees *Burhinidae* and only 15 of the 48 populations of plovers, 2 of the 6 loons and divers *Gaviidae* and 4 of the 11 pratincole *Glareolidae* populations are covered by qualifying sites in the breeding season.

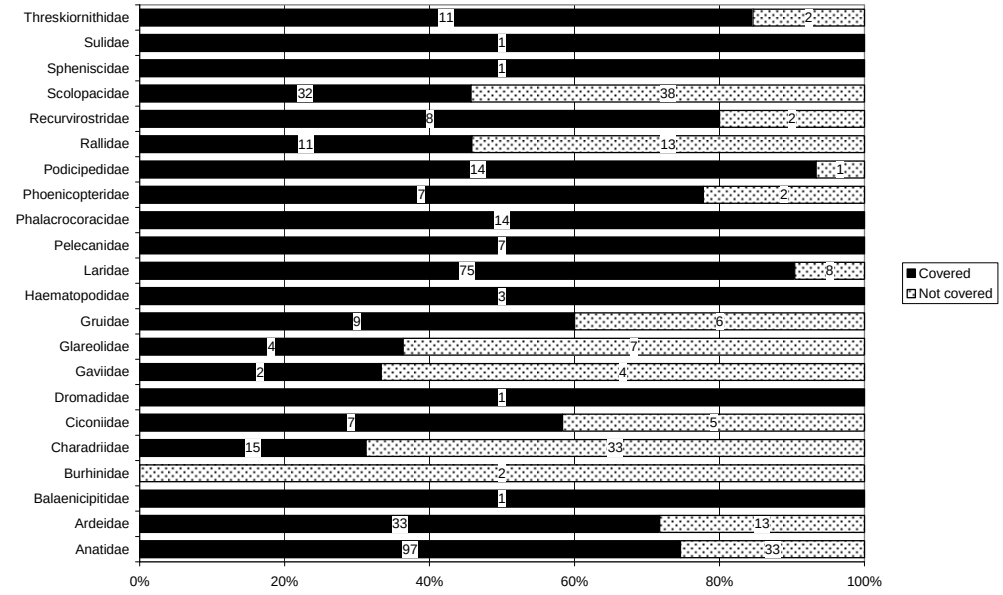



**Figure 4 Number and proportion of AEWA populations covered by the CSN in the breeding season by families**

Figure 5 presents the same information for the non-breeding season and, in general, a higher proportion of populations in all families that have internationally important sites identified for them. The only notable exceptions are the herons *Ardeidae* and the gulls and terns *Laridae* which both have less populations covered with qualifying sites in the CSN in the non-breeding season; this is not surprising sincesince these are colonially breeding species.

Figure 6 shows that, of all the waterbird families, on average, the highest coverage index is recorded for flamingos *Phoenicopteridae* in both the breeding and non-breeding seasons. This can be explained by their habit of breeding colonially in specialised habitats, and by their highly congregatory behaviour in the non-breeding season. High coverage of pelicans *Pelecanidae* and cranes *Gruidae* in the non-breeding season can be explained by their soaring migration which funnels them along narrow migration corridors. Likewise, ducks, geese and swans *Anatidae* use several stop over sites between their breeding and wintering areas and the proportions of the population at all of these sites add up to a high aggregated total.

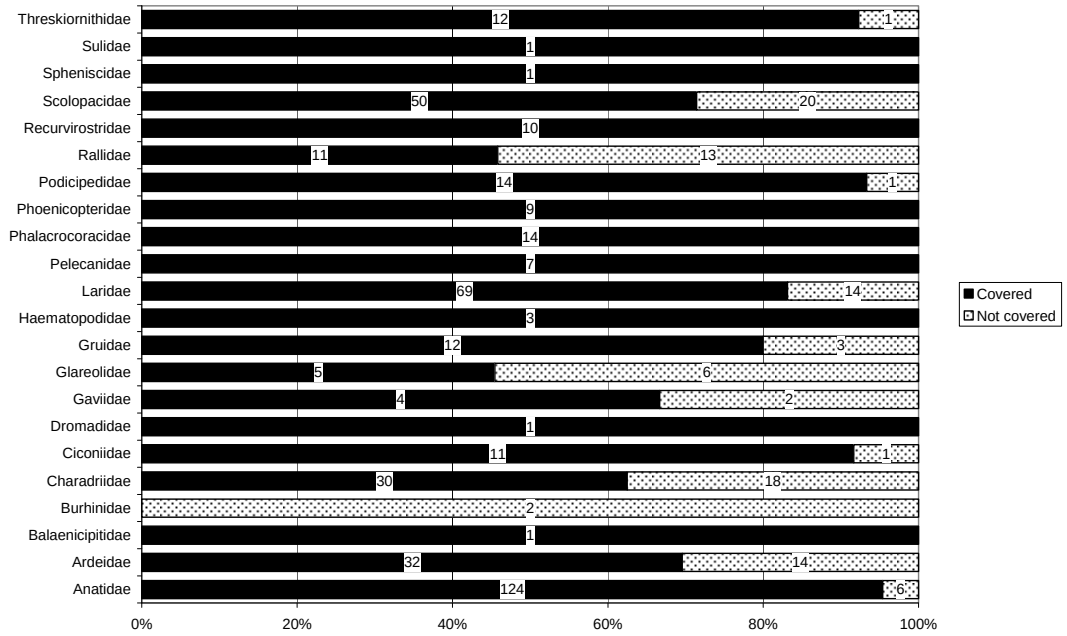



**Figure 5 Number and proportion of AEWA populations covered by the CSN in the non-breeding season**

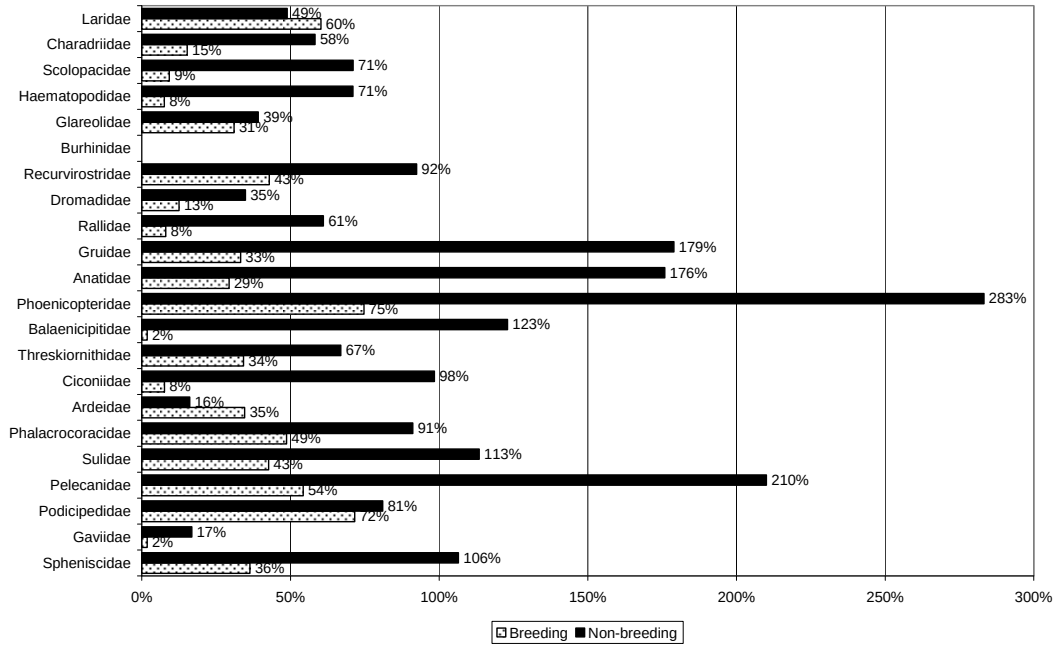



**Figure 6 Average coverage index of AEWA populations of waterbird families by the CSN**

## Designation of internationally important sites

Half of the Critical Sites have ‘most’ or the ‘whole’ of their area designated as protected areas, while the other half has only ‘some’ ,‘none/ unknown’ of their area covered by protected areas (Figure 7).

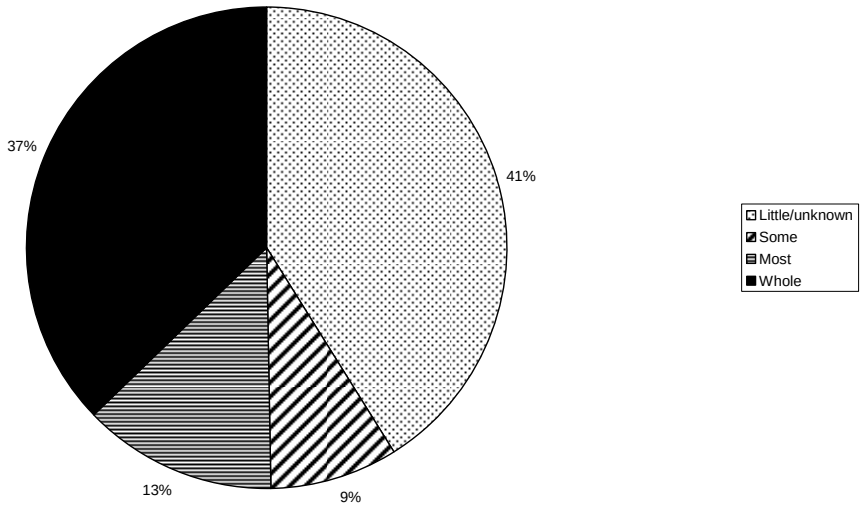



**Figure 7 Degree of overall designation of Critical Sites**

However, there are substantial regional differences in the degree of designation of Critical Sites. In North and Southwestern as well as in Central Europe 60-70% of the Critical Sites have at least 'most' of their area designated, while in all other subregions the level of designation is lower (Figure 8).

Countries with particularly high proportion of protected areas include most of the EU Member States as well as Croatia, Belarus, Turkey, Guinea, Benin, Ghana and the Democratic Republic of Congo (Figure 9). On the other hand, there is a relatively low level of designation in most countries on the West Asian – East African flyway. It is important to note here, that according to the 5th edition of the AEWA Conservation Status Report, this region holds the largest number of declining populations and the generally low degree of site designation, combined with unsustainable use of waterbird populations may explain the dire situation in this flyway.

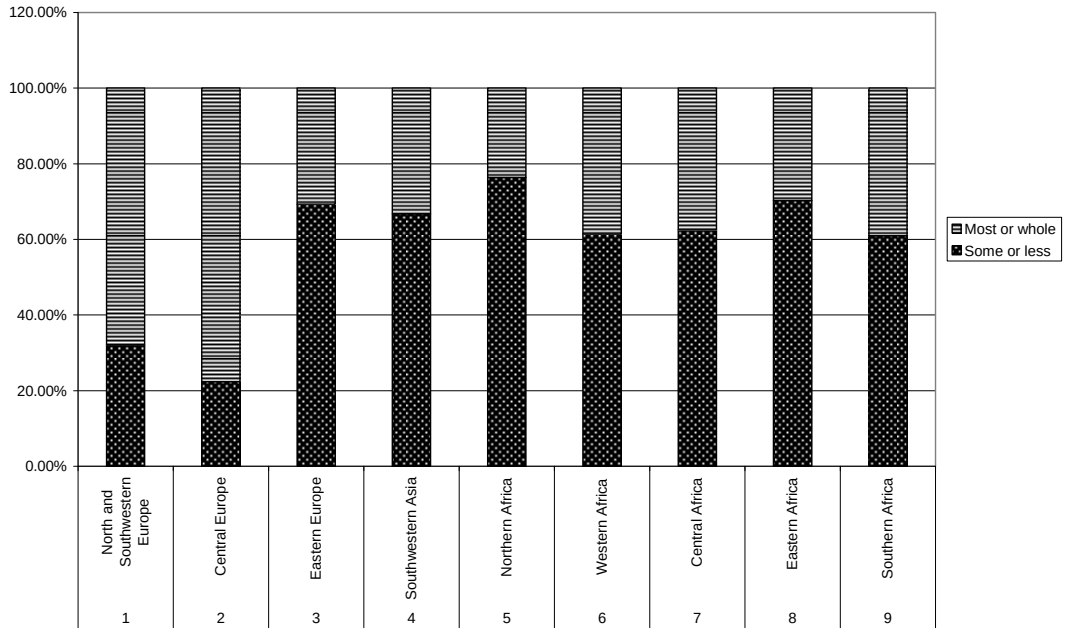



**Figure 8 Degree of overall designation of Critical Sites by AEWA subregions.**

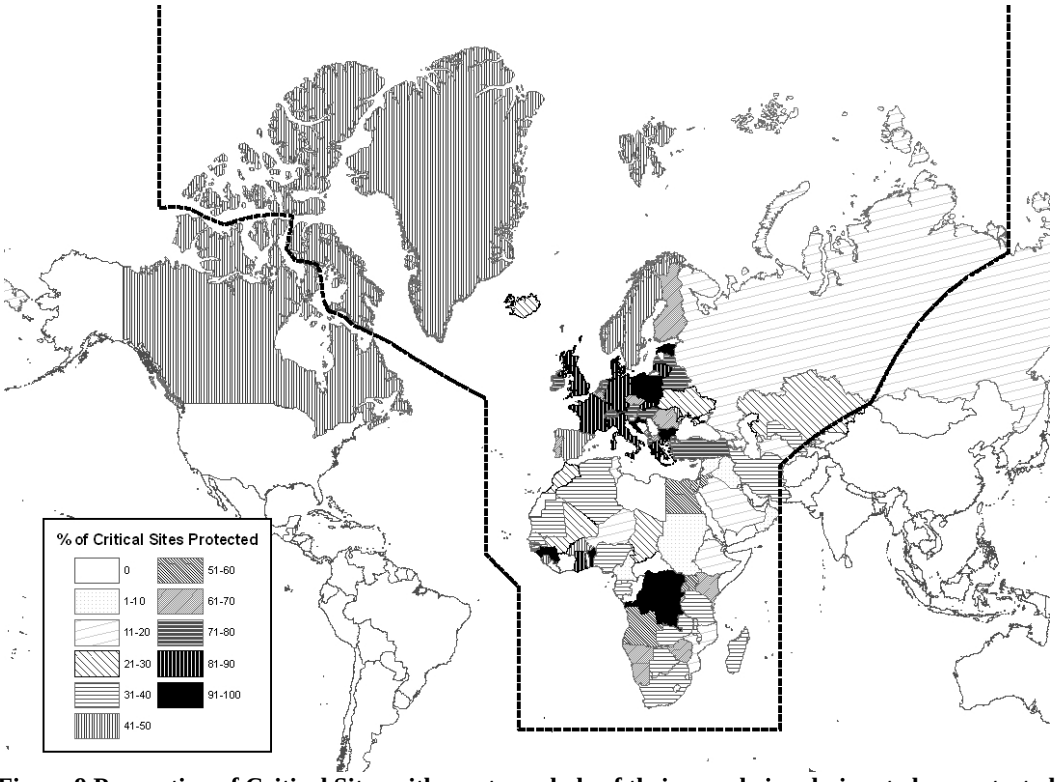



**Figure 9 Proportion of Critical Sites with most or whole of their area being designated as protected areas.**

Figure 10 shows the coverage of the Critical Sites by various designation types. 876 (29%) Critical Sites are covered by some form of national designation. This is closely followed by 843 (27%) Special Protection Areas designated under the EU Birds Directive. 400 (13%) sites are included on the List Wetlands of International Importance under the Ramsar Convention.

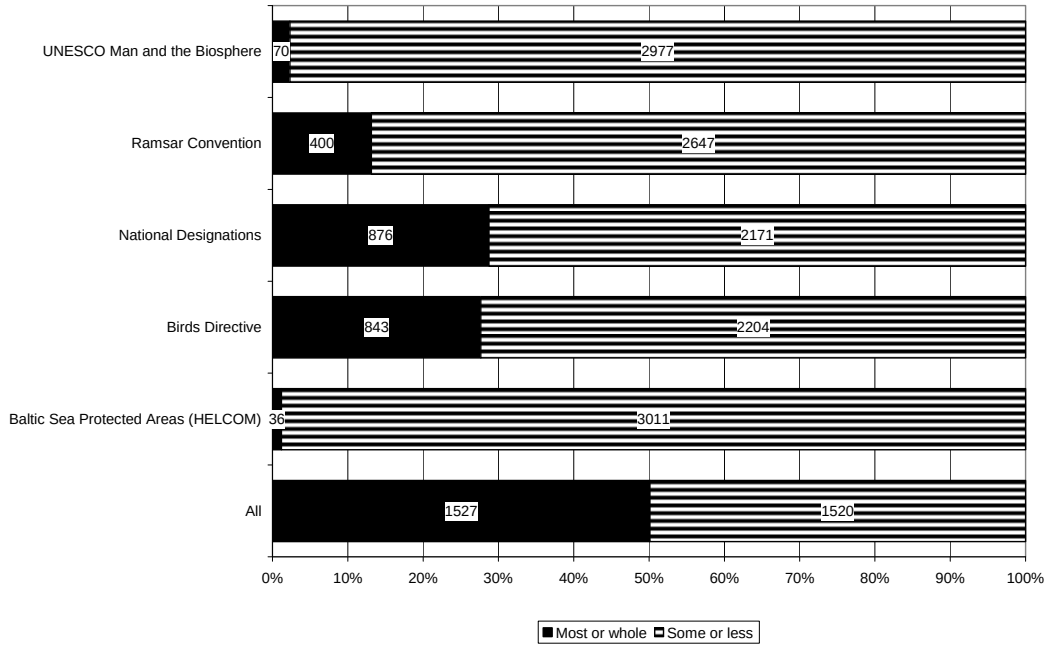



**Figure 10 Coverage of the CSN in the Agreement Area by protected area types**

Again, substantial differences can be observed amongst the various subregions concerning the types of designations of the Critical Sites. The Birds Directive only applies in the European Union and, therefore, only affects three AEWA subregions: North and Southwest Europe, Central Europe and the Baltic States in Eastern

Europe (Figure 11). In the first two of these regions it is the most frequent designation type. In all other regions except West Africa, most Critical Sites have national designations although numerous sites are also designated as Ramsar Sites and only a few as Biosphere Reserves or World Heritage Sites. Not surprisingly, the Baltic Sea Protected Areas under the Helsinki Convention are restricted to the three European subregions and cover only a limited number of sites because its scope is restricted to the marine environment in the Baltic Sea region.

Unfortunately, no data was available at this time to assess the coverage of the OSPAR Marine Protected Areas and of the EMERALD Network under the Bern Convention although the latter is also applicable in part of Africa and West Asia.

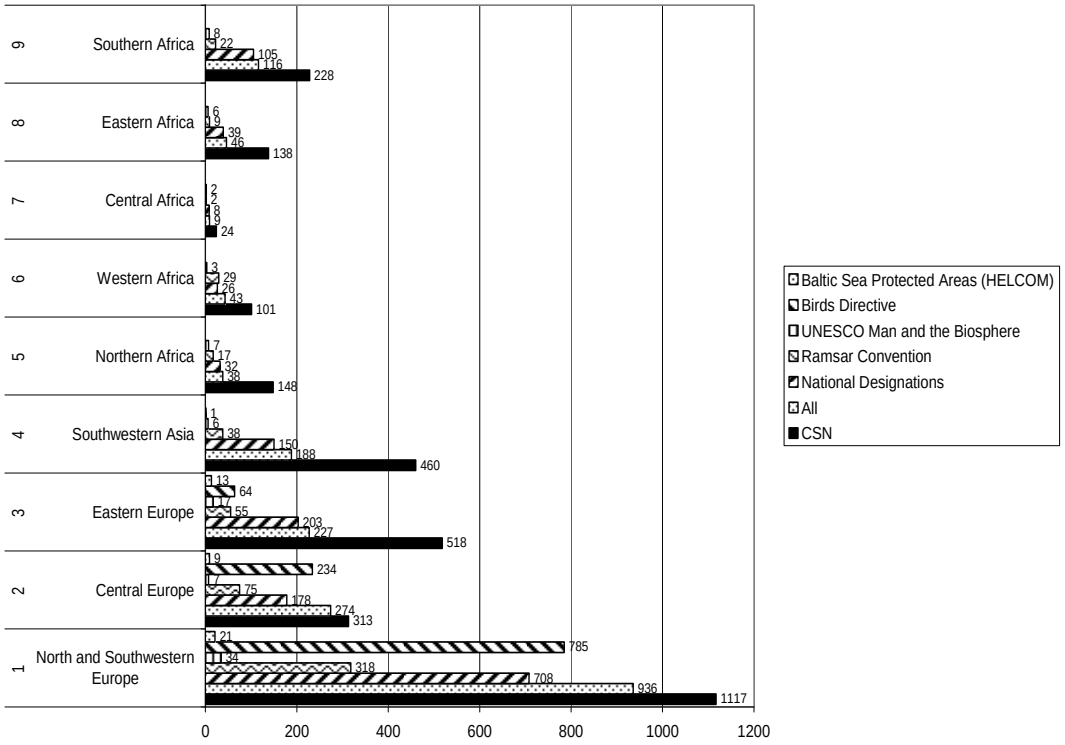



**Figure 11 Critical Sites by designation types in each AEWA subregions**

Slightly more than 40% of the AEWA populations have more than half of their population covered by protected areas in the breeding season and only 30% have more than half of their population covered during the non-breeding season.

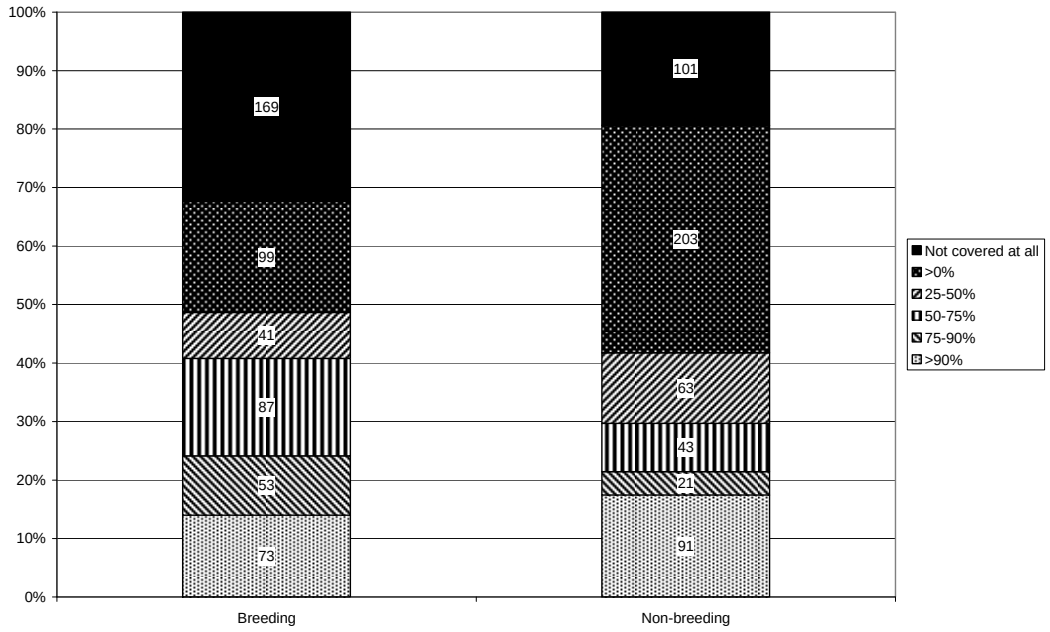



**Figure 12 Coverage of populations by protected areas during the breeding and non-breeding seasons**

## Management of internationally important sites

According to Figure 13, only 3% of the Critical Sites have comprehensive and appropriate management plans that aim to maintain or improve the populations of qualifying species. A further 6% has some plan but it is out of date or not comprehensive and in case of 5% has been reported that the management planning has started. However, in case of 86% of the sites there either no management plan or there is no information available concerning the management planning.

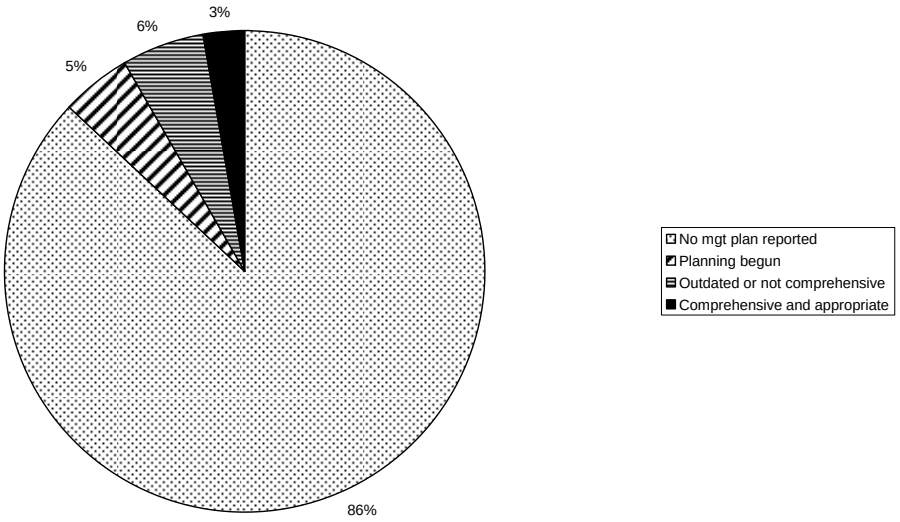



**Figure 13 Proportion of Critical Sites with different degrees of management planning progress**

According to Figure 14, comprehensive and effective implementation of the measures needed for the site was reported from only 1% of the sites. At another 8% of the Critical Sites, implementation of substantive conservation measures was reported and for another 5% some limited conservation measures. However, for 86% of the sites there was either very little conservation action implemented or these measures were not reported.

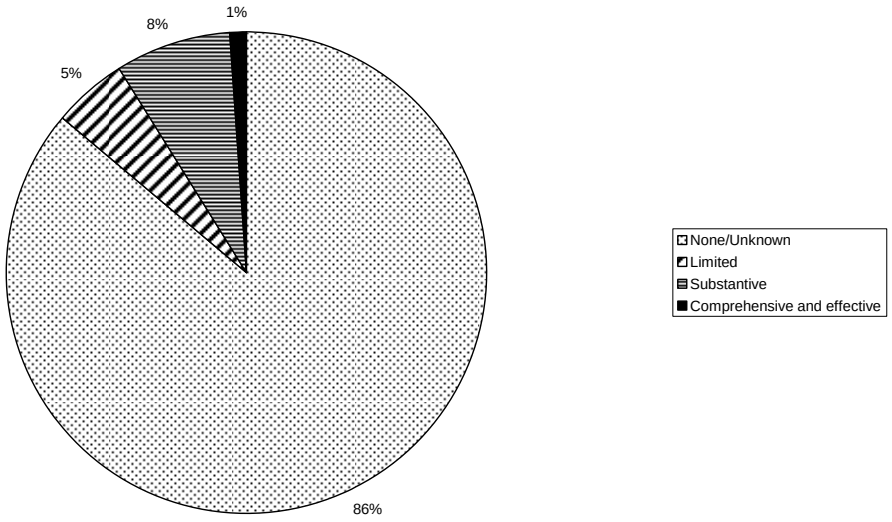



**Figure 14 Proportion of Critical Sites with different degrees of progress on implementing conservation measures**

## Gaps in designation and management

Considering that there is only limited information available concerning management planning and conservation measures, almost all sites have some gaps in designation and management. Country profiles listing the sites in order of priority for filling gaps in designation and management are presented in Annex 3[7].

Figure 8, Figure 11 and Figure 15 show that major gaps in designation exist in Eastern Europe, Southwestern Asia and most of Africa.

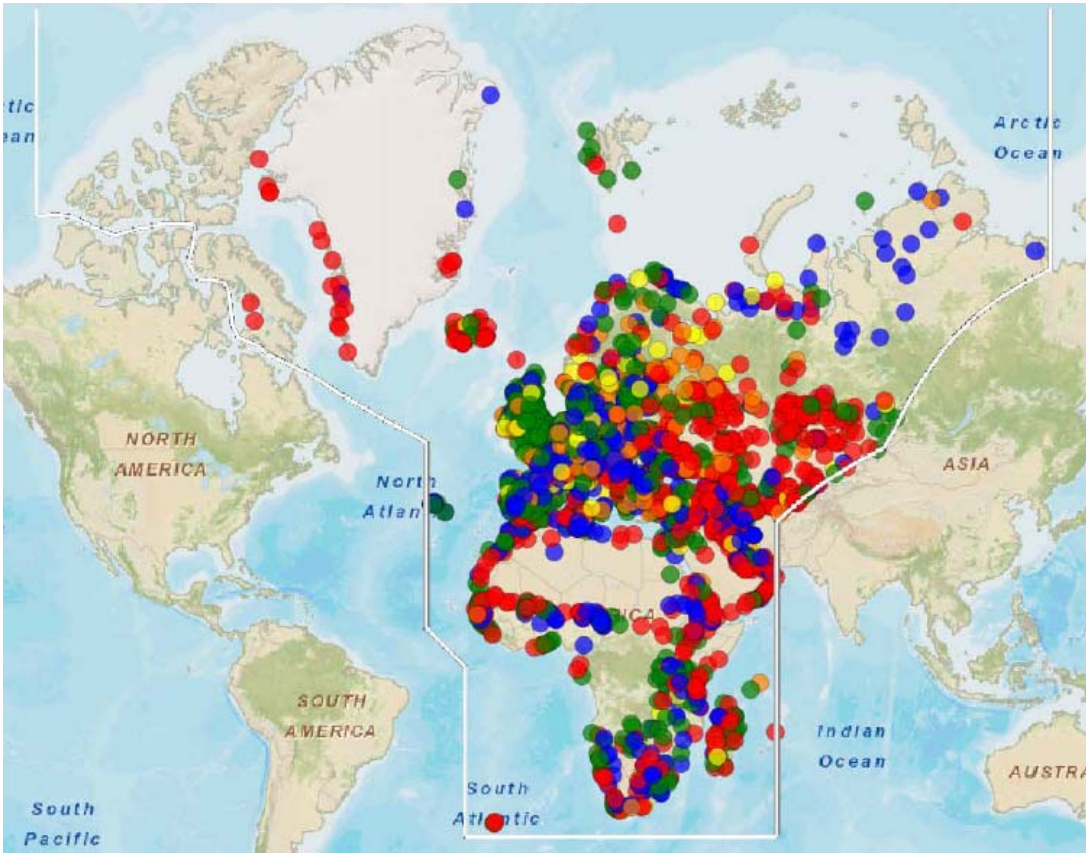



**Figure 15 Degree of designation of Critical Sites for AEWA species as protected areas. Red: little/none, green: whole, yellow: most, blue: unknown, orange: some. Map produced by the Critical Site Network Tool[8].**

Table 7 lists the Critical Sites with high priority score and with little or no designation according to available information. Of the 74 sites with high (>1.0) priority score, 11 can be found in the Russian Federation, 8 in Kazakhstan, 6 in Morocco, 5 in Iran and Israel, 4 in Iraq, 3 in Tanzania. The other 24 countries have only one or two unprotected high priority sites.

**Table 7 Critical Sites with high priority score (>1.0) and with little or no designation according to available information.**

| Country | Site name |
|---|---|
| Algeria | Lac Fetzara |
| Algeria | Dayette Morsli - Plaine de Remila (Dayet El Ferd) |
| Armenia | Lake Arpi |
| Azerbaijan | Lake Sarysu |
| Egypt | El Malaha |
| Gabon | Akanda |

[7] It is important to note that priority scores should only inform prioritisation within a country, but not necessarily applicable at international level because of different reporting rates of countries on management planning and conservation actions.
[8] The map can be replicated by the following steps: (1) Select Reports page. (2) Select AEWA under Legal Protection. (3) Tick Show matching sites. (4) Select Show Critical Sites by Protected in the result panel.

| Country | Site name |
|---|---|
| Guinea-Bissau | Rio Tombali, Rio Cumbijã and Ilha de Melo |
| Iceland | Lónsfjördur |
| Iran, Islamic Republic of | South Caspian shore, from Astara to Gomishan |
| Iran, Islamic Republic of | Horeh Bamdej |
| Iran, Islamic Republic of | Lake Maharlu |
| Iran, Islamic Republic of | Harm lake |
| Iran, Islamic Republic of | Seyed Mohalli, Zarin Kola and Larim Sara |
| Iraq | Haur Al Rayan and Umm Osbah |
| Iraq | Haur Al Suwayqiyah |
| Iraq | Haur Al Hammar |
| Iraq | Central Marshes |
| Israel | Jezre'el, Harod and Bet She'an valleys |
| Israel | Zevulun valley |
| Israel | Carmel coast |
| Israel | Hefer valley |
| Israel | Northern lower Jordan valley |
| Kazakhstan | Ashchykol and Barakkol Lakes |
| Kazakhstan | Kyzylkol Lake |
| Kazakhstan | Shalkar Lake |
| Kazakhstan | Chardara Reservoir |
| Kazakhstan | Vicinity of Korgalzhyn village |
| Kazakhstan | Kushmurun Lake |
| Kazakhstan | Lower reaches of the Emba River |
| Kazakhstan | Zharkol Lakes |
| Kenya | Lake Elmenteita |
| Libya | Geziret Garah |
| Madagascar | Cape Anorontany archipelago |
| Madagascar | Southwestern Coastal Wetlands and Nosy Manitse |
| Mali | Lac Faguibine |
| Mauritania | Aftout es Sâheli |
| Mauritania | Gâat Mahmoûdé |
| Morocco | Barrage Mohamed V |
| Morocco | Marais Larache |
| Morocco | Barrage al Massira |
| Morocco | Merzouga/Tamezguidat |
| Morocco | Aguelmane de Sidi Ali Ta'nzoult |
| Morocco | Sebkha Zima |
| Norway | Varangerfjord |
| Oman | Barr al Hikman |
| Oman | Masirah island |
| Russian Federation | Lover Ob' |
| Russian Federation | Chernoye Lake |
| Russian Federation | Kurtan Lake |
| Russian Federation | Kolguev island |
| Russian Federation | Terski coast |
| Russian Federation | Shalkaro-Zhetykol'ski lake system |
| Russian Federation | Dadynskiye lakes |
| Russian Federation | Blagoveschenskaya (Kulunda lake and vicinity) |
| Russian Federation | Man'yass lake |
| Russian Federation | Stekleney Lake |
| Russian Federation | Bykovo lake |

| Country | Site name |
|---|---|
| Saudi Arabia | Gulf of Salwah |
| Saudi Arabia | Gulf coral islands |
| Seychelles | Cosmoledo atoll |
| Seychelles | Desnoeufs island |
| Somalia | Jasiira Maydh |
| South Africa | Franklin vlei |
| Tanzania, United Republic of | Lake Eyasi |
| Tanzania, United Republic of | Latham Island |
| Tanzania, United Republic of | Lake Kitangire |
| Tunisia | Chott Djerid |
| Tunisia | Sebkhet Sidi Mansour |
| Turkey | Çol lake and Çalikdüzü |
| Ukraine | Agricultural lands near Bilorets'ke (Chornozemne village) |
| United Arab Emirates | Siniyah island |
| Uzbekistan | Tudakul and Kuymazar Reservoirs |
| Yemen | Qishn beach |
| Yemen | Abdullah Gharib lagoons |

On average, the protected area network covers only half what is being covered by the CSN (Figure 16). There is relatively little difference between families, which suggests that this pattern can be largely explained by the overall degree of designation (see Figure 7). However, the gap is significantly larger in the case of the loons and divers *Gaviidae* and the grebes *Podicipedidae* during the breeding season than is the case for other families.

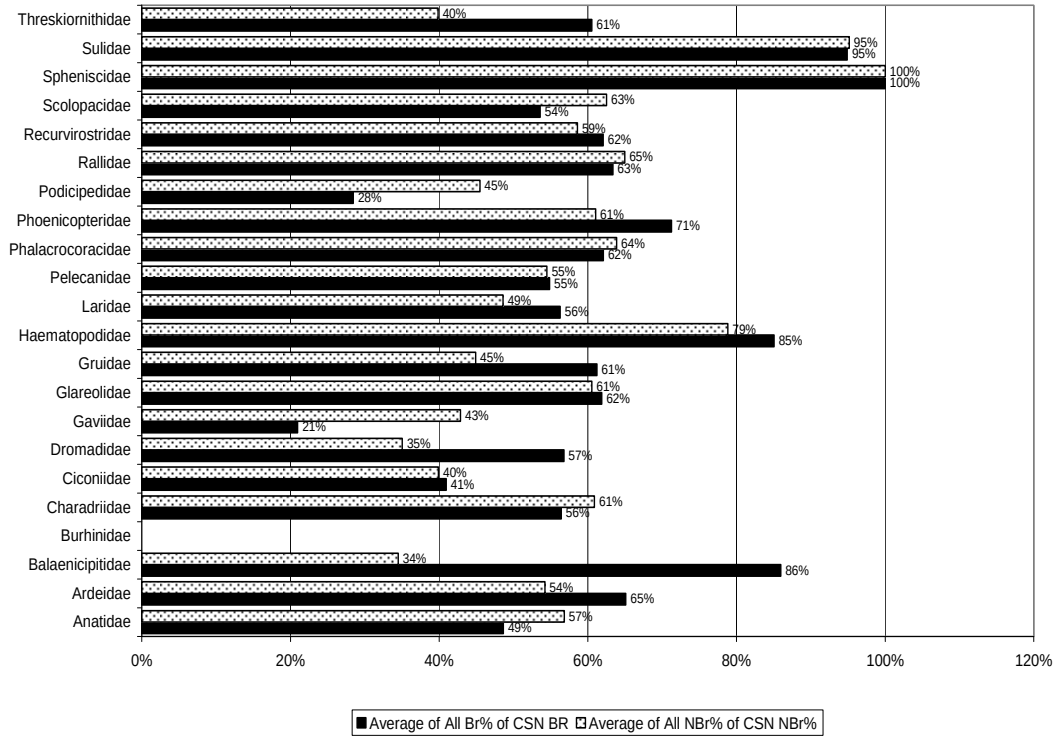



**Figure 16 Average proportions of the populations per family included in the CSN that is covered by protected areas**

Table 8 and Table 9 lists the populations which, according to available information, are not covered by the protected area network although more than 10% of their population is covered by the CSN.

**Table 8 Populations with more than 10% of their breeding population in the CSN but not covered by protected areas in that season**

| Population | CSN coverage |
|---|---|
| Pelecanus onocrotalus, Eastern Africa | 17% |
| Phalacrocorax nigrogularis, Gulf of Aden, Socotra, Arabian Sea | 20% |
| Calidris alpina alpina, NE Europe & NW Siberia/W Europe & NW Africa | 39% |
| Sterna bergii thalassina, Eastern Africa & Seychelles | 118% |
| Sterna bergii velox, Red Sea & North-east Africa | 19% |
| Sterna bergii enigma, Madagascar & Mozambique/Southern Africa | 106% |
| Larus leucophthalmus, Red Sea & nearby coasts | 27% |
| Sterna bengalensis emigrata, S Mediterranean/NW & West Africa coasts | 102% |
| Sterna bengalensis par, Red Sea/Eastern Africa | 32% |

**Table 9 Populations with more than 10% of their non-breeding population in the CSN but not covered by protected areas in that season**

| Population | CSN coverage |
|---|---|
| Podiceps cristatus infuscatus, Eastern Africa (Ethiopia to N Zambia) | 41% |
| Anas erythrorhyncha, Eastern Africa | 15% |
| Glareola ocularis, Madagascar/East Africa | 114% |
| Calidris temminckii, NE Europe & W Siberia/SW Asia & Eastern Africa | 17% |
| Sterna dougallii bangsi, North Arabian Sea (Oman) | 11% |
| Sterna dougallii arideensis, Madagascar, Seychelles & Mascarenes | 70% |
| Sterna bergii velox, Red Sea & North-east Africa | 22% |
| Sterna bergii enigma, Madagascar & Mozambique/Southern Africa | 11% |
| Sterna dougallii dougallii, East Africa | 11% |
| Chlidonias hybridus sclateri, Eastern Africa (Kenya & Tanzania) | 30% |
| Sterna repressa, W South Asia, Red Sea, Gulf & Eastern Africa | 13% |
| Larus hemprichii, Red Sea, Gulf, Arabia & Eastern Africa | 21% |

## Comprehensiveness and coherence of the Critical Site Network

A new algorithm to assess the coherence of the Critical Site Network for each waterbird population has been built into the CSN Tool (Figure 17). Proportion of each population covered by the CSN and number of Critical Sites where the species occurs in internationally important numbers is available for each AEWA sub-region on the CSN Tool[9].

Summary results of the assessment of coherence for the AEWA populations covered by this report are presented in Annex 4 for the Critical Site Network and in Annex 5 for all protected areas combined. (Data for other protected area networks are also available and were used in the subsequent analysis, but not provided as part of this report).

The network includes sites for almost 2/3 of the AEWA populations both during the breeding and non-breeding seasons, for 19% only during the non-breeding season and for 6% only during the breeding season; 13% of the AEWA populations are not covered by the CSN at all (Figure 18). This finding reflects both the distribution

[9] In case of designation types, sites are only counted if more than 50% of the Critical Site is covered by the selected designation type.

patterns of the AEWA populations and knowledge gaps. Many waterbird populations do not congregate sufficiently in certain (usually the breeding) stages of the life cycle to meet threshold numbers for international importance unless vast geographic areas are considered. In certain cases, especially in poorly known areas or in the case of cryptic species, lack of knowledge also hinders the identification of internationally important sites. In other cases, mainly in Africa, populations are so large that the 1% thresholds are simply too high for any sites to hold internationally important numbers, even in the case of colonial breeders.

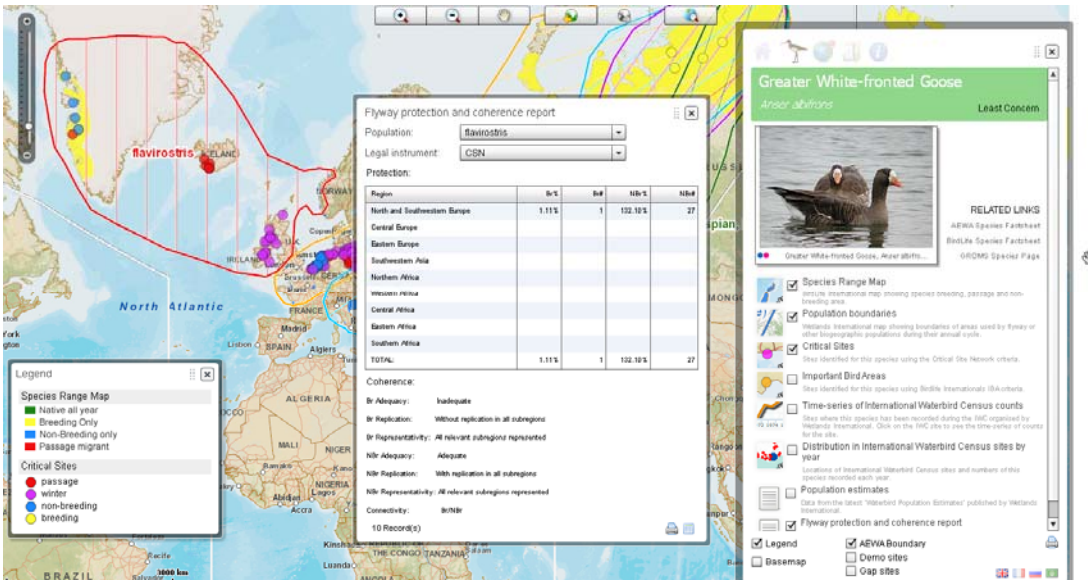



**Figure 17 New functionality in the CSN Tool to assess coherence of site networks for individual populations**[10]

Figure 19 shows that about one third of the AEWA populations are not covered at all by Critical Sites during the breeding season, 37% are covered adequately and for 31% the coverage can be classified as inadequate. However, during the non-breeding season, almost two thirds of the AEWA populations are adequately covered by the Critical Sites, only 16% are covered inadequately and 19% are not covered at all by the CSN (Figure 20).

During the breeding season 37% of the AEWA populations have at least one Critical Site in each of the relevant subregions, 12% only in some subregions and 19% is represented in the network without replication (Figure 21). During the non-breeding season almost half of the AEWA populations have replication in all relevant subregions and an additional 22% have replication in at least some relevant subregions (Figure 22).

[10] (1) Select Species searc page. (2) Enter (part of) species name and/or select from the list. (3) You may switch on Species Range Map, Population boundaries and Critical Sites if you want to see such background information. (4) Switch on Flyway Protection. (5) Select the Population of interest and CSN as legal instrument.

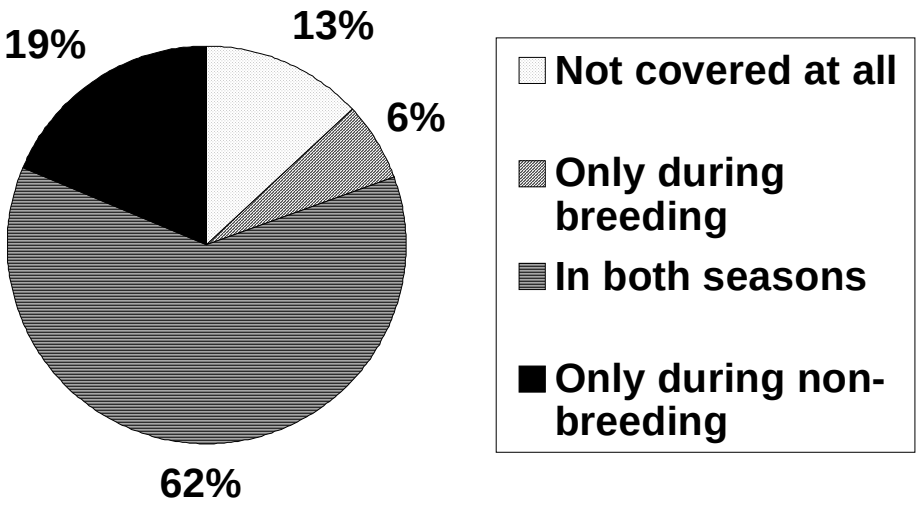



**Figure 18 Connectivity of the CSN for AEWA populations.**

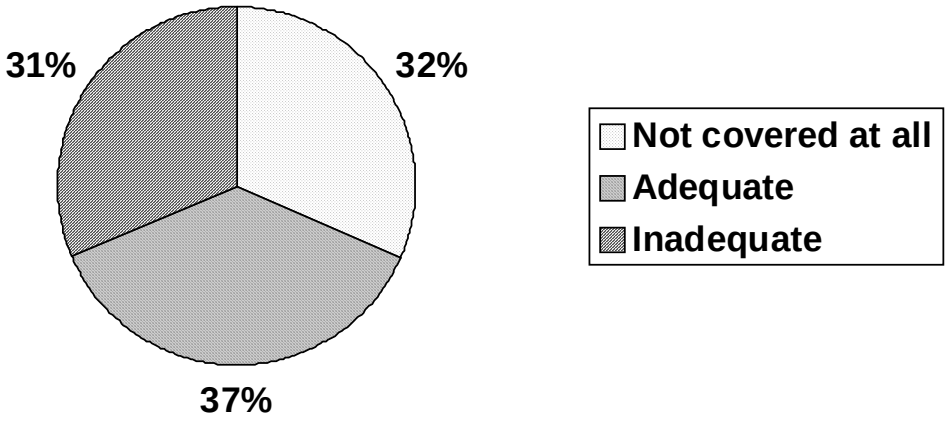



**Figure 19 Adequacy of coverage of the AEWA populations by the CSN during the breeding season**

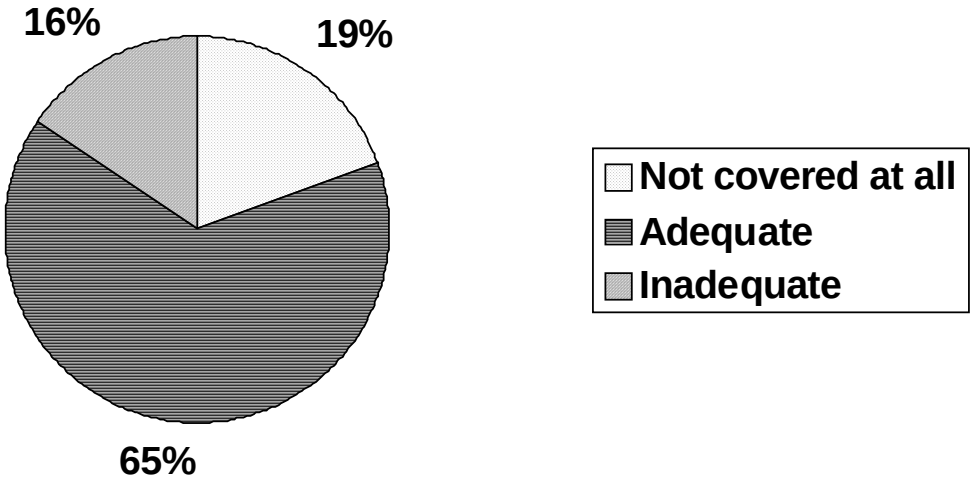



**Figure 20 Adequacy of coverage of the AEWA populations by the CSN during the non-breeding season**

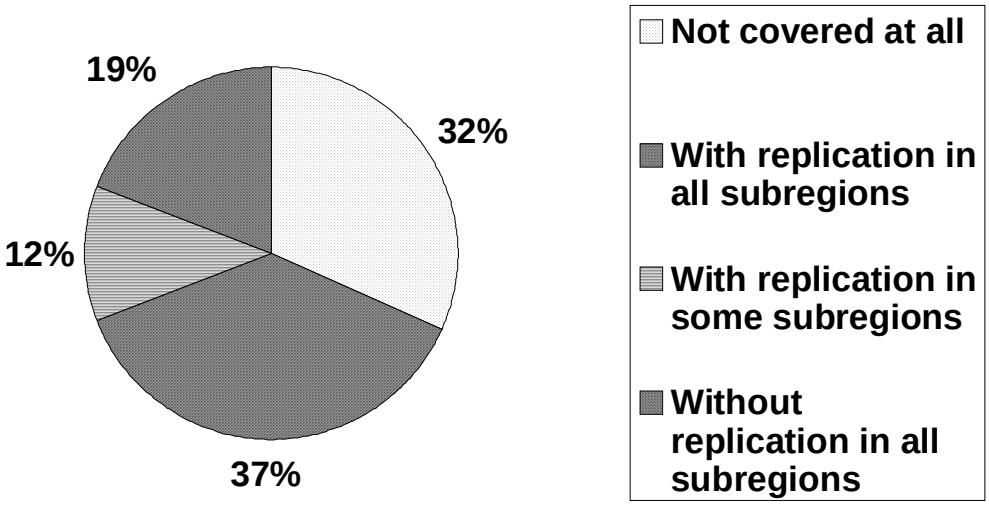



**Figure 21 Percentage of populations with different degrees of subregional Critical Site replication during the breeding season**

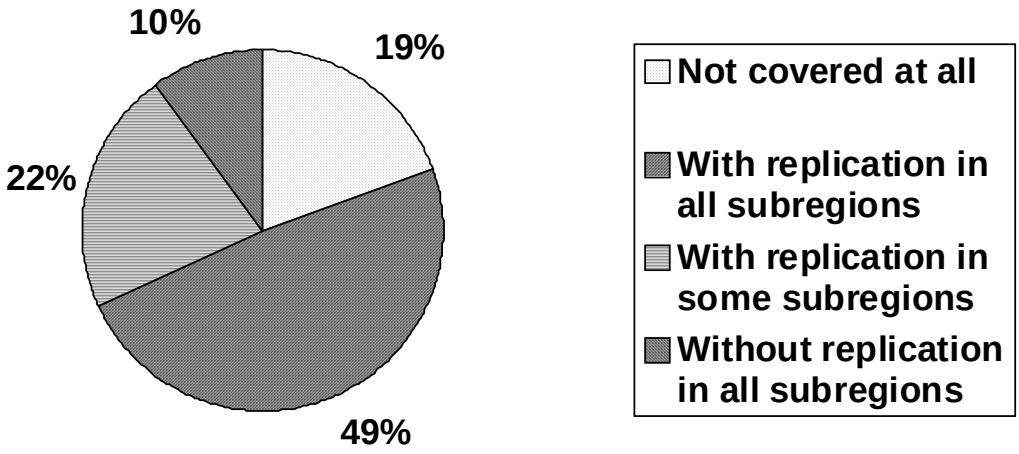



**Figure 22 Percentage of populations with different degrees of subregional Critical Site replication during the non-breeding season**

Assessing the adequacy of the CSN by families, only a few families have a high proportion (>60%) of their populations adequately covered by the network in the breeding season (Figure 23), but more are adequately covered in the non-breeding season (Figure 24). There is only one family, the thick-knees *Burhinidae*, that is not covered in either season. In general, the CSN offers adequate coverage of only the minority of rails, crakes and allies *Rallidae* and pratincoles *Glareolidae*. For other families, the CSN provides adequate coverage of more than half of their populations in at least one of the seasons.

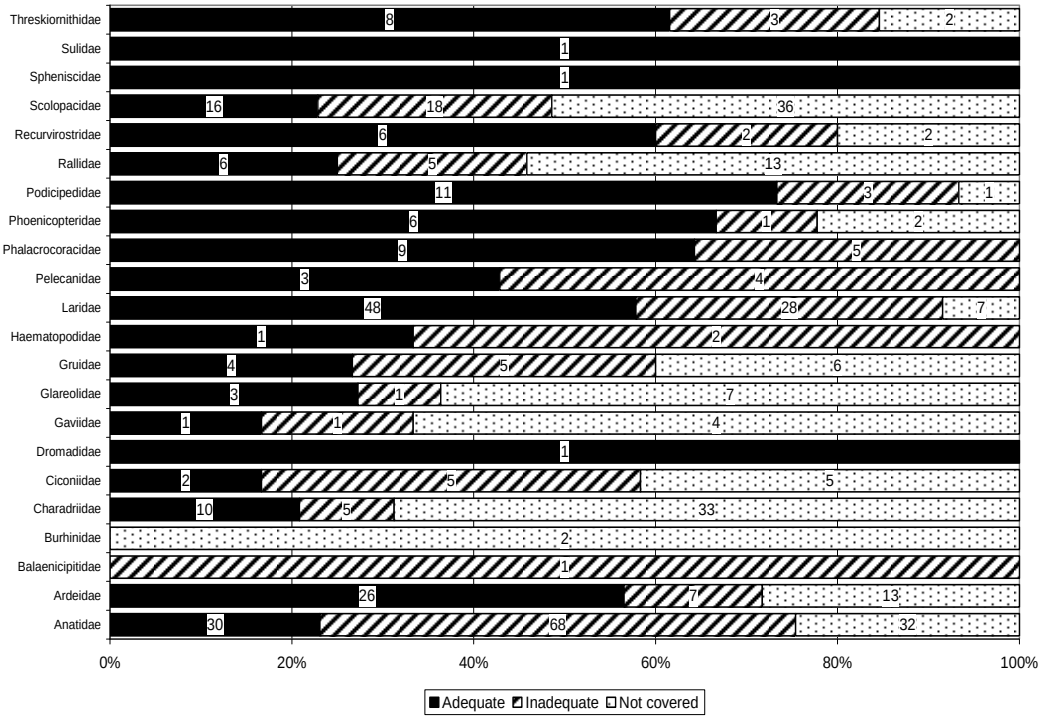



**Figure 23 Adequacy of the CSN for different waterbird families in the breeding season**

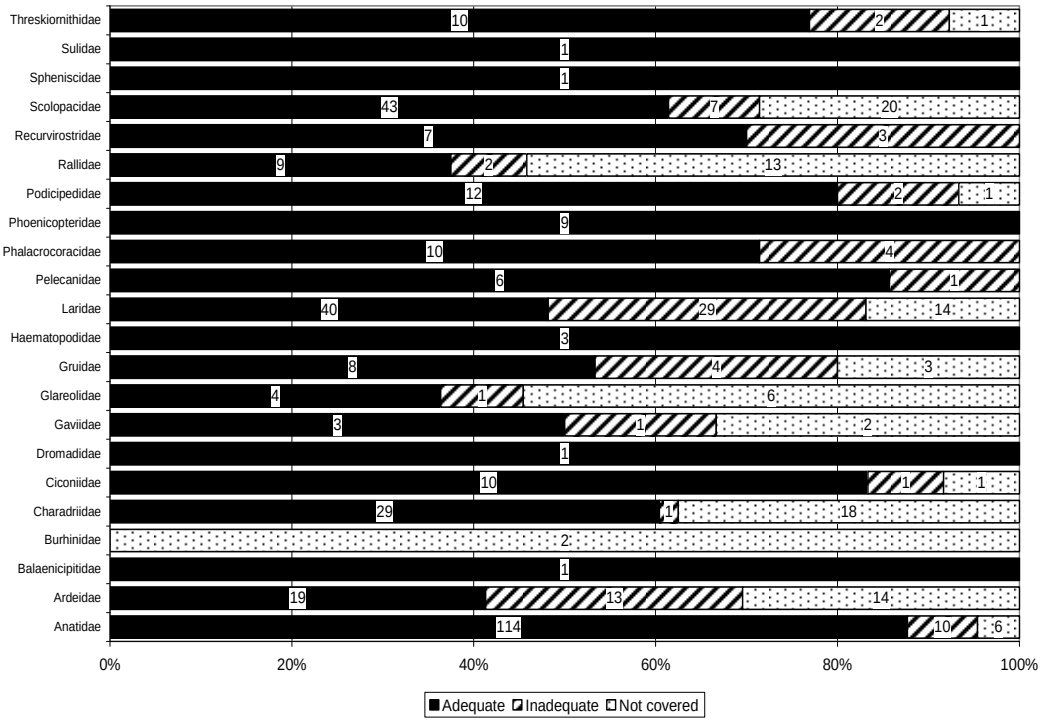



**Figure 24 Adequacy of the CSN for different waterbird families in the non-breeding season**

As Figure 25 and Figure 26 show, there is little difference in adequacy of the coverage of populations according to their AEWA categories, i.e. populations using a small number of sites, populations of species listed on Appendix 1 of CMS, populations of globally threatened species or others, with the exception of birds that occur on a small number of sites in the breeding season.

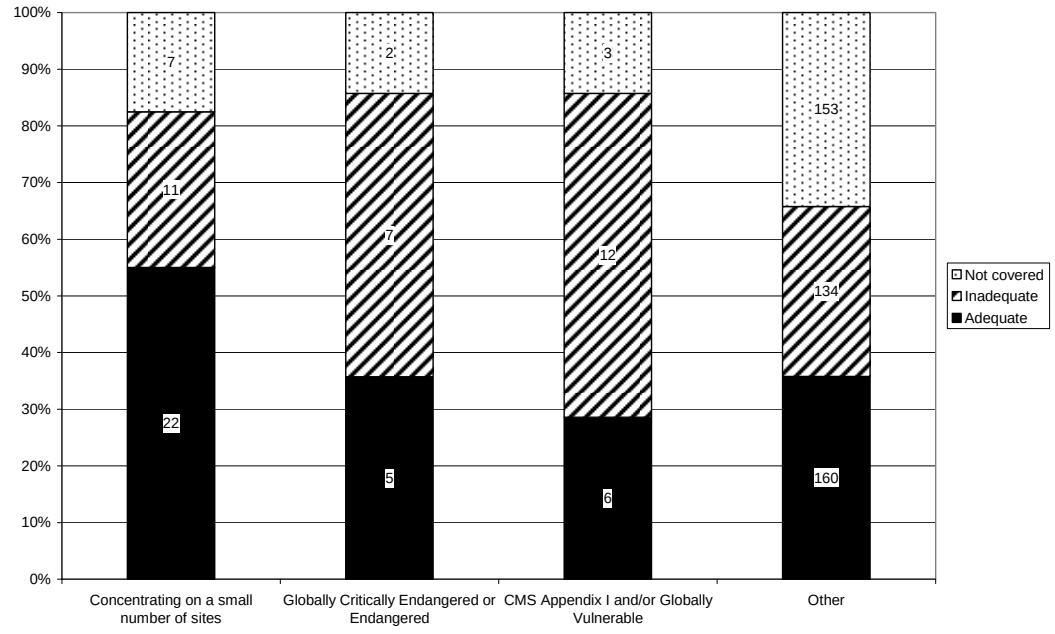



**Figure 25 Adequacy of the CSN coverage by types of populations in the breeding season (see correspondence with AEWA categories in Figure 2)**

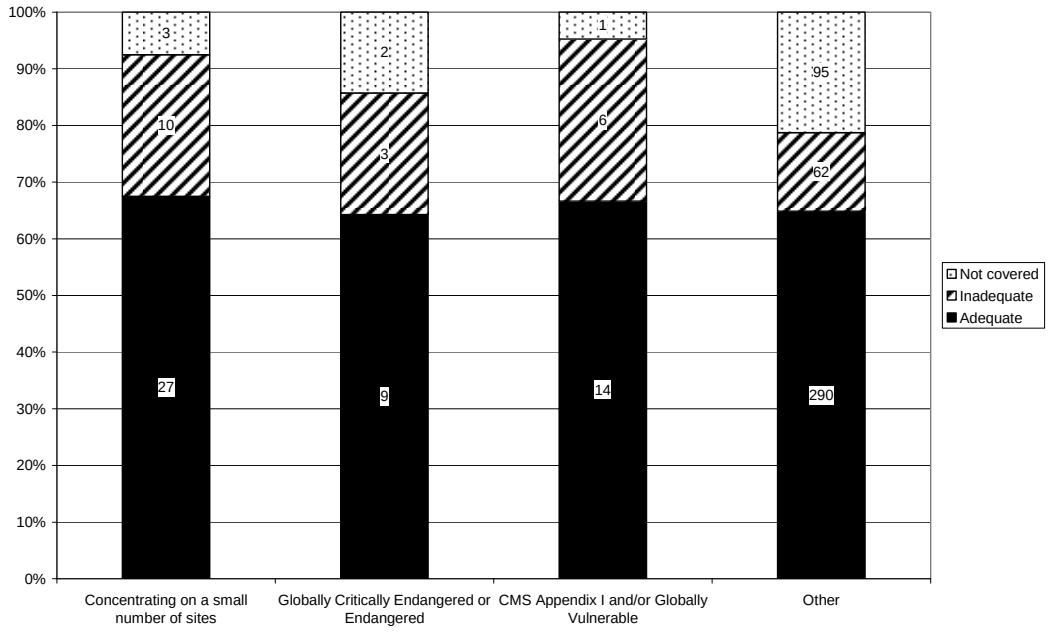



**Figure 26 Adequacy of the CSN coverage by types of populations in the non-breeding season (see correspondence with AEWA categories in Figure 2)**

## Comprehensiveness and coherence of the of existing international site networks in relation to the site network objectives of AEWA

Figure 27 compares the number of populations covered by the CSN, all protected areas together, national designations and the various international site networks with sufficient data for the analysis. Clearly, more populations are covered by national designations alone than by any of the international site networks. Amongst the latter, the global networks such as the Ramsar Convention or the Man and Biosphere Reserve network cover more AEWA populations than the regional, (i.e. EU Birds Directive), or subregional (e.g. HELCOM) instruments.

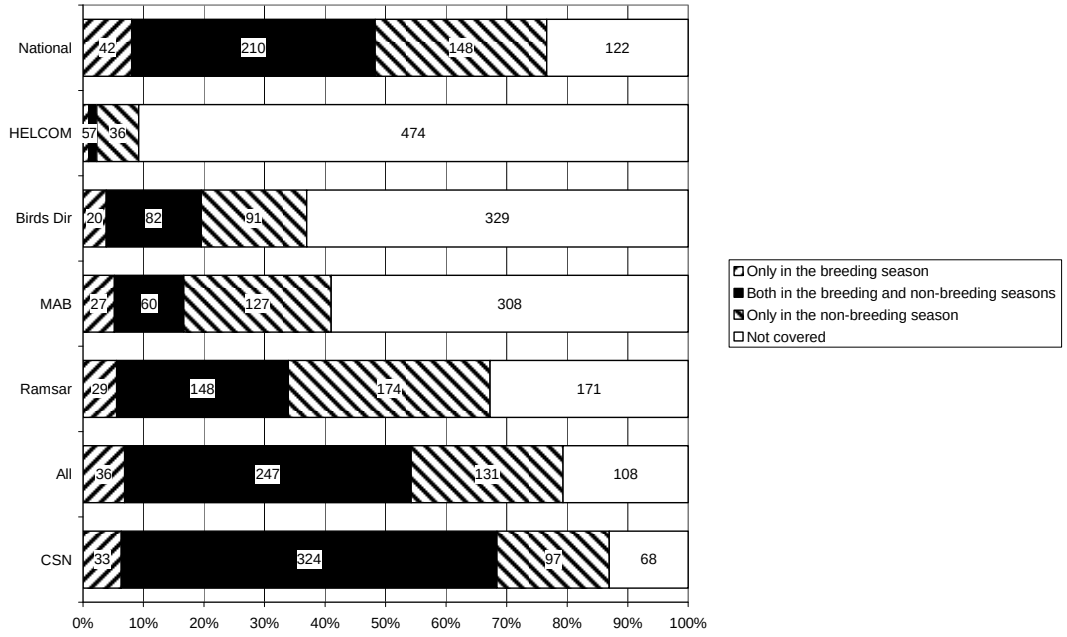



**Figure 27 Connectivity of the site network covered by various designation types**

Figure 28 compares the adequacy of various international designation types to the one of the CSN. In both seasons, the number of populations adequately covered by the overall protected area network equals to the ones covered by national designations, which indicates that national designation has played a major role in providing adequate coverage to AEWA populations.

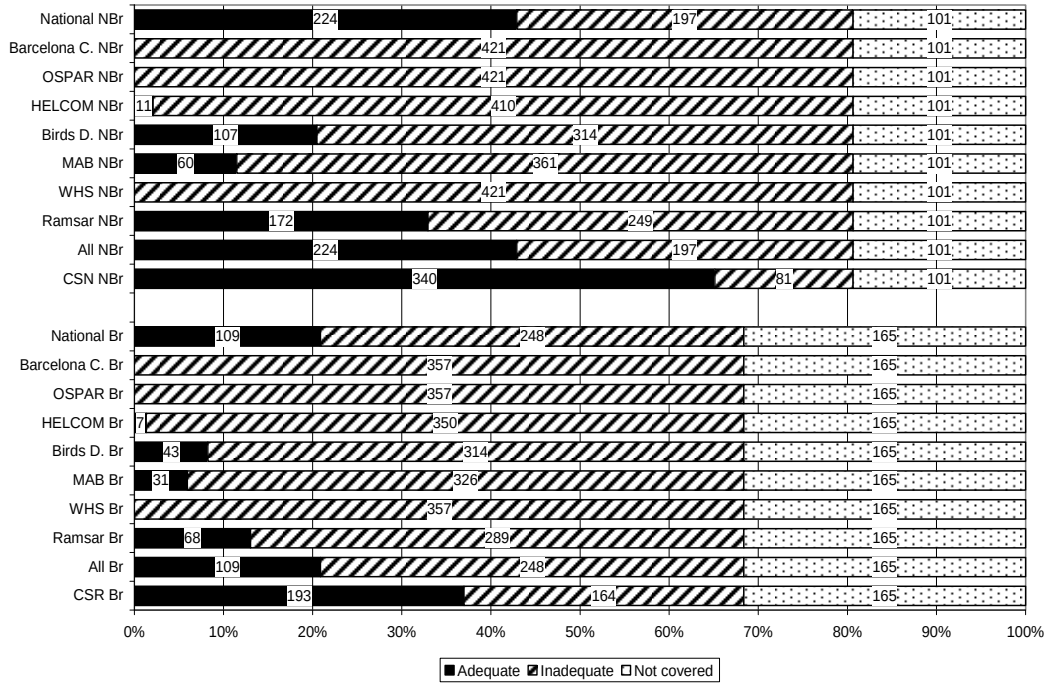



**Figure 28 Adequacy of various international site networks in comparison to the CSN in the Br = breeding and NBr = non-breeding seasons**

Considering the various international designation types, it is the Ramsar Convention that provides adequate coverage to 68 breeding populations and 172 non-breeding populations. As mentioned earlier that is only 13% of all populations, and 35% of the ones covered adequately by the CSN. In the non-breeding season, these figures are 33% and 50% respectively. This reflects the wide geographic spread of Ramsar Sites (Figure 29).

It is important to observe that the SPA network designated under the EU Birds Directive (Figure 30) provides adequate coverage for fewer populations in both seasons than the Ramsar Site network. This may seem to be in contradiction with the findings related to Figure 9 that SPAs are the second most frequent designation type for Critical Sites. However, it only reflects the fact that there are relatively fewer populations that can be adequately conserved only in the European Union in either season.

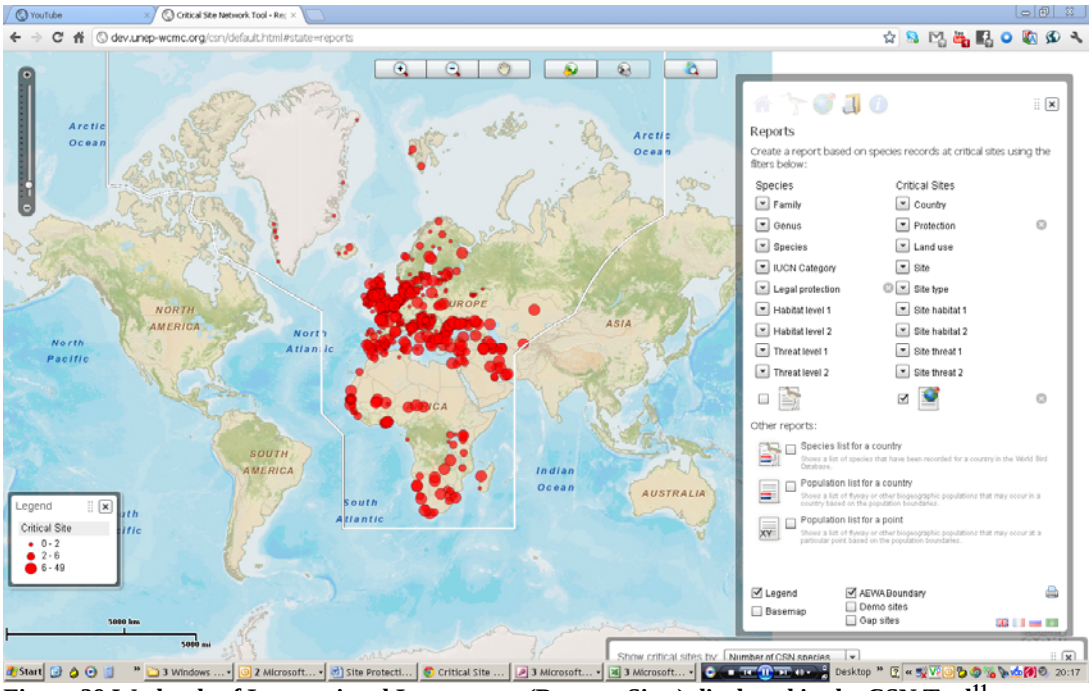



**Figure 29 Wetlands of International Importance (Ramsar Sites) displayed in the CSN Tool[11]**

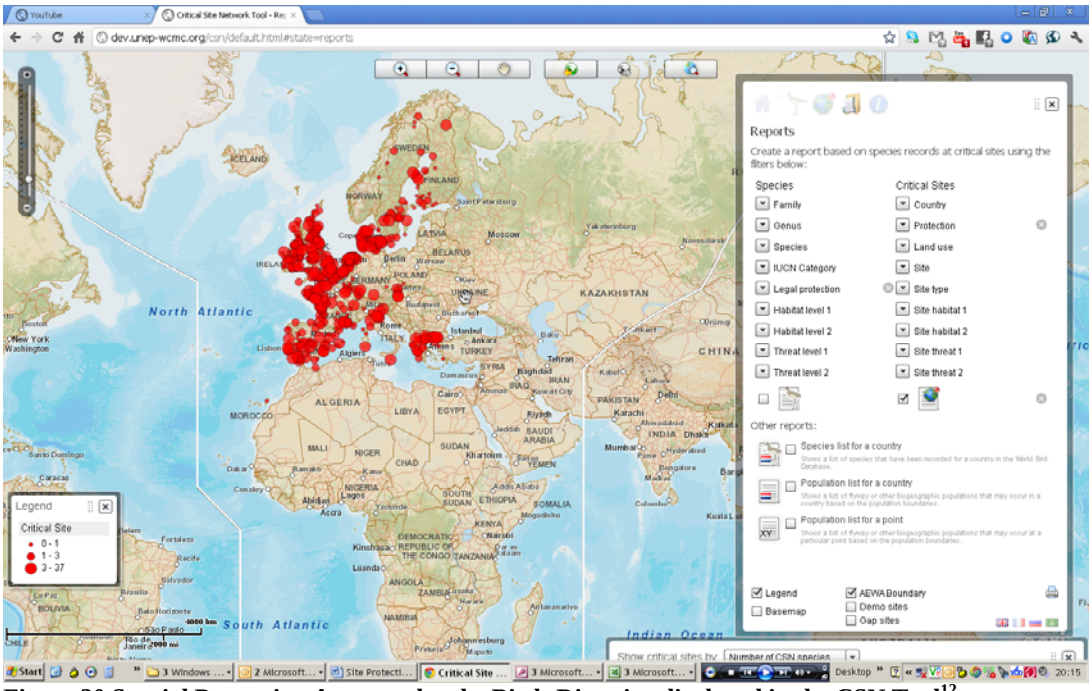



**Figure 30 Special Protection Areas under the Birds Directive displayed in the CSN Tool[12]**

[11] (1) Select Report page on the CSN Tool, (2) Select only AEWA under Species\Legal protection, (3) Select only Wetlands of International Importance under Critical Sites\Protection, (4) Click on Show matching sites.

[12] Same us above, but select Birds Directive under Step (3).

Figure 31 compares the representativity of various international designations with that of the CSN, of the overall protected area network and of national designations. As with measures of adequacy, national designations provide the highest level of representativity albeit less complete than that of all designation types combined or of the CSN itself. In the breeding season, there are 105 populations represented in the CSN but not picked up by national protected area networks and for 73 populations only some of the subregions are represented. In the non-breeding season, 43 populations represented in the CSN aree not represented in any type of designated area and 146 populations are represented only in some subregions.

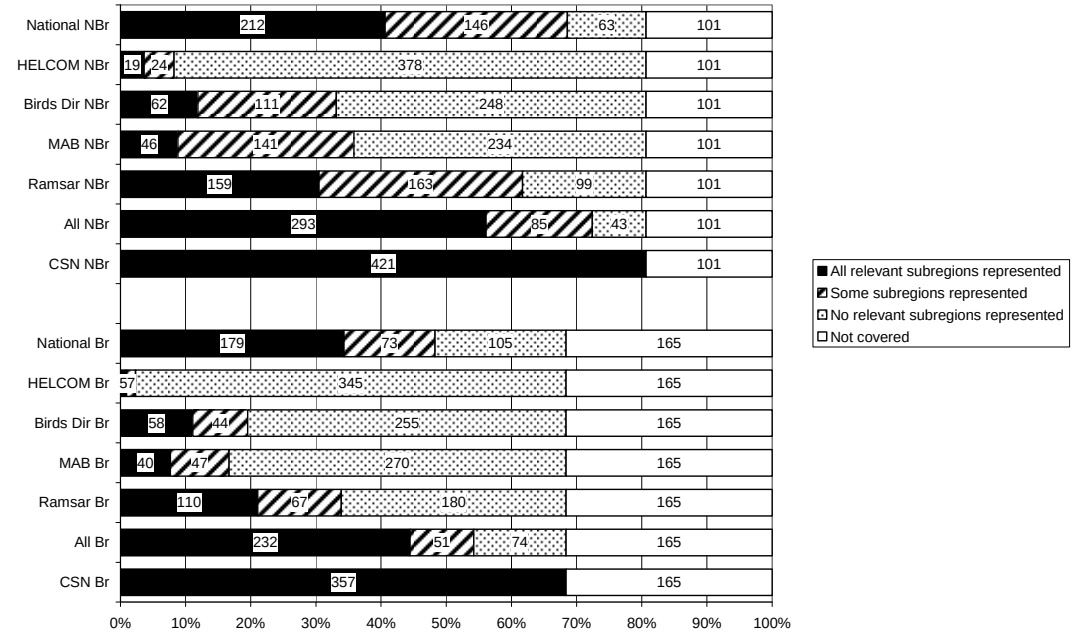



**Figure 31 Representativity of the Critical Sites identified for AEWA populations under different designation types**

Amongst the global site designation types, the Ramsar Convention offers a far better coverage than the Biosphere Reserves or the World Heritage Sites, which is not surprising considering that the Convention aims to include all internationally important wetlands. However, the Ramsar Sites network represents all relevant subregions only in the case of 110 populations during the breeding season and 159 in the non-breeding season and 180 populations in the breeding and 99 populations in the non-breeding season are not represented in the network at all.

The representativity of the regional site protection instruments is limited in comparison to the coherence objectives of AEWA despite the fact that the Birds Directive has a very high coverage in the relevant AEWA subregions (Figure 11).

Figure 32 compares the replication of various international designations to the CSN, all designations combined (all) and the national designations. National designations provide replicated coverage in at least some of the subregions for 144 population in the breeding season and 269 populations in the non-breeding season. That is 56% and 73% of the replication in the CSN itself.

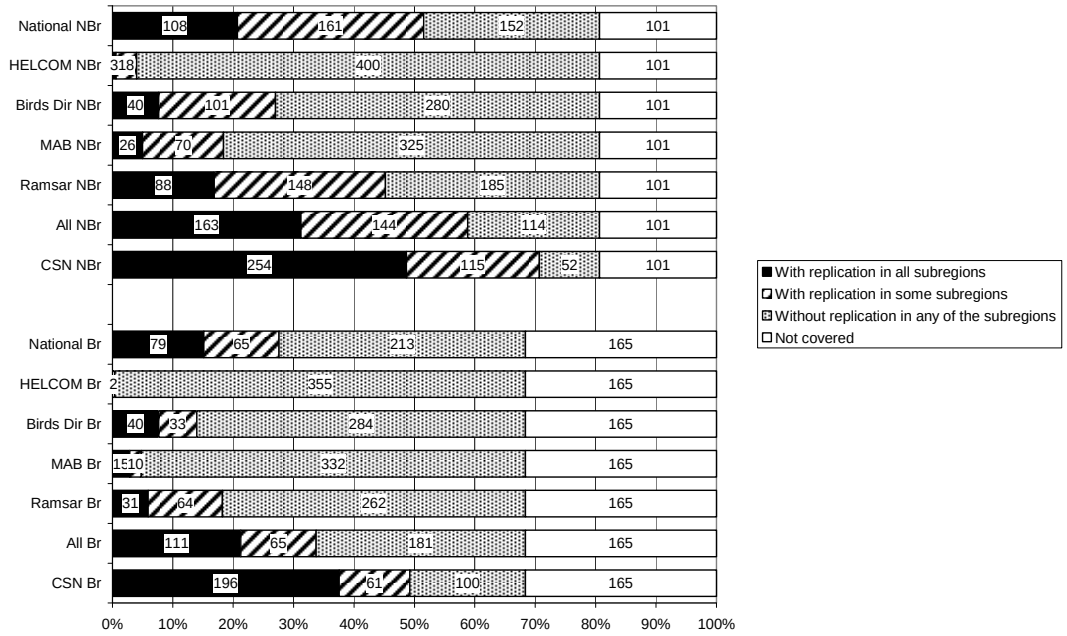



**Figure 32 Replication of Critical Sites in various international designation types for the AEWA populations**

National designations combined with various international designations offer somewhat higher replication than only national designations, i.e. 83% and 68% respectively.

Amongst the international designation, the Ramsar Sites are replicated for most populations in both seasons, followed by the SPA network of the EU Birds Directive with higher replication in the breeding season than in the non-breeding season. This pattern arises from the global nature of the Ramsar Convention. However, even the Ramsar Convention provides some sort of replication for only 64% of the populations even in the non-breeding season (the season with higher replication).

In comparison, the Biosphere Reserve network offers replicated site networks only for a few dozens of populations and the regional Baltic Sea SPA network for even fewer populations.

## Conclusions and recommendations

### Key conclusions concerning coverage of waterbird families

- The review concluded that 85% of the AEWA populations have at least one Critical Site identified for that population in either the breeding or non-breeding season, but only 61% have Critical Sites identified in both seasons (page 22). The proportion of AEWA populations covered by the Critical Site Network generally reflects their distribution patterns. Populations of various waterbird families tend to have higher coverage in the non-breeding season than in the breeding season, reflecting their general tendency to congregate in the non-breeding season and disperse when breeding. The exceptions to this pattern are herons *Ardeidae* and gulls and terns *Laridae* which breed colonially and tend to be more dispersed in the non-breeding season; consequently higher proportions of the populations within these families are covered by the Critical Site Network in the breeding season than in the non-breeding season. Families that are congregatory during both the breeding and non-breeding seasons have the highest coverage. These include the flamingos *Phoenicopteridae*, pelicans *Pelicanidae*, cranes *Gruidae* as well as ducks, geese and swans *Anatidae.* Families which have populations with more dispersed distribution in certain seasons tend to have a lower proportion of the population covered by the Critical Site Network in that season. Thick-knees *Burhiniidae* and divers *Gaviidae* have low coverage by the Critical Site Network throughout the year (Figure 6).
- On average, the coverage of AEWA populations by various types of protected areas is only 55% of that covered by the Critical Site Network (Figure 16). 19 populations with a substantial proportion of their population in the Critical Site Network in at least one of the season (i.e. over 10%) are not covered by any protected areas in that season (Table 8 and Table 9).

Based on the above, the following key recommendations can be made:

1. Designation of the Critical Sites through national and international instruments could substantially increase the proportion of each AEWA population afforded some degree of protection.
2. Conservation measures focusing on important sites should be complemented with broad habitat conservation measures and it would be useful to develop habitat conservation strategies in Africa and Southwest Asia similar to those presented in the book *Habitats for Birds in Europe*[13].

### Key conclusions concerning geographic patterns in designation and management

- Only half of Critical Sites have most or all of their area designated (Figure 7). However, there are significant geographic differences; in North and Southwestern Europe as well as in Central Europe where the Birds Directive applies around two thirds of the Critical Sites have most or all of their area designated , while in Africa and Southwest Asia this applies to less than one third of the Critical Sites (Figure 8). Comprehensive and appropriate management plans have been reported from only 3% of the Critical Sites, 6% are reported to have management plans that are outdated or not comprehensive (Figure 13).Necessary management measures for the site are reportedly being implemented at only 1% of the Critical Sites, 8% of Critical Sites are reported to have substantive conservation measures and a further 5% has some limited conservation measures in place (Figure 14).
- Almost two thirds of the Critical Sites identified are in Europe and only one third in the rest of the Agreement area, which strongly suggests that there might still be significant gaps in the identification of internationally important sites (Figure 11).
- Most of the protected Critical Sites are covered by some kind of national designations. The most common international instrument under which Critical Sites are designated is the EU Birds Directive, followed by the Ramsar Convention. It is important to note, however, that 78% of the Ramsar Sites in overlap with Critical Sites have been designated in the three European AEWA subregions and overlap with SPAs (Figure 11). Despite the fewer sites being designated under the Ramsar Convention, it offers 'adequate' coverage for 68 AEWA populations in the breeding season and 172 in the non-breeding season, while the Birds Directive offers 'adequate' coverage for 43 and 107 populations respectively. This finding highlights that the conservation afforded by the Birds Directive is geographically limited and the conservation of flyway-scale protection of the Critical Site Network requires complementary instruments (Figure 28).

[13] Tucker and Heath 1997. Habitats for Birds in Europe: a conservation strategy for the wider environment. BirdLife International, Cambridge, UK. (BirdLife Conservation Series No. 6)

Based on the above, the following key recommendations can be made:

3. Parties, Range States and other stakeholders should conduct gap filling surveys in poorly known areas, in particular which were identified during the subregional consultations conducted under the Wings Over Wetlands and WetCAP projects, to assess their international importance.
4. Gap filling surveys should focus initially on identifying key sites for globally threatened bird species not included into the Critical Site Network
5. At the national level, increasing the proportion of Critical Sites with appropriate management and conservation measures in place would be of considerable benefit to AEWA populations.
6. Parties should develop and implement national action plans for filling gaps in designation and management of internationally important sites to make progress towards establishing a coherent flyway network by 2017. The prioritized country profiles presented in Annex 3, the Critical Site Network Tool, available wetland inventories and other appropriate sources of information could inform the development of such action plans. This activity would also contribute to reaching the long-term target set out under the 'Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance of the Convention on Wetlands'.
7. The WOW Partnership, that includes AEWA, BirdLife International, the Ramsar Convention, the UNEP World Conservation Monitoring Centre and Wetlands International, could provide assistance in developing such action plans and could increase management capacity able to address the specific ecological requirements of migratory waterbirds through the implementation of the Flyway Training Programme developed under the Wings Over Wetlands Project as a contribution to the Plan of Action for Africa.
8. A Plan of Action similar to the Plan of Action for Africa should be developed also for Southwest Asia.
9. Parties, acting as donors in international development co-operation should provide assistance to the establishment of a comprehensive and coherent flyway network of protected and managed sites that fulfill the joint objectives of AEWA, the Convention on Biodiversity, the Ramsar Convention on Wetlands and other international treaties.

### Key conclusions concerning data availability

- The creation of the Critical Site Network Tool through the Wings Over Project has made it possible to produce the first ever international overview on designation and management of internationally important sites in the Agreement area.
- The identification of Critical Sites and the assessment of their conservation have been primarily based on population data and protected area information that is held in the international databases maintained by BirdLife International, the UNEP World Conservation Monitoring Centre and Wetlands International. This information critically depends on national updates and data management capacity at international level.
- Information concerning designation and management of international site networks is sparse, highly dispersed in various datasets and was sometimes inaccessible to the project. Revisions by national experts were received only in minority of cases (see page 15)
- Lack of up-to-date information on the status of Critical Sites could hamper the ability of decision makers to guide future strategy and direct conservation effort appropriately.

Based on the above, the following key recommendations can be made:

10. Parties to AEWA should consider making reporting on designation, management planning and conservation action part of the national reporting process.
11. The WOW Partnership should make every effort to keep the Critical Site Network Tool up-to-date in order to provide decision-makers with key information to support their conservation planning.
12. Parties should implement monitoring schemes that monitor the state, pressure and responses at internationally important sites for waterbirds, maximising the synergies with the monitoring of sites designated under the Ramsar Convention and the EU Birds Directive.

# Annexes[14]

**Annex 1 Worked example for calculating conservation importance and site action scores**

**Annex 2 Coverage of waterbird populations by the CSN and various protected area designations during the breeding and non-breeding seasons**

**Annex 3 Prioritized country profiles**

**Annex 4 Coherence of the Critical Site Network for waterbird populations in the Agreement Area**

**Annex 5 Coherence of the protected area network covering the Critical Sites for waterbird populations in the Agreement Area**

[14] Annexes 1 to 5 are provided on the MOP5 document website as seperate documents (MOP5.15 Annex 1 – 5): http://www.unep-aewa.org/meetings/en/mop/mop5_docs/mop5_docs.htm