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REPORT ON THE DEVELOPMENT OF WATERBIRD MONITORING ALONG THE AFRICAN-EURASIAN FLYWAYS TO THE 8TH SESSION OF THE MEETING OF THE PARTIES

Compiled by Wetlands International and the UNEP/AEWA Secretariat

Executive Summary

This paper presents an overview of the progress that has been made by the *African-Eurasian Waterbird Monitoring Partnership* since MOP7 in response to operative paragraph 5 of Resolution 6.3. The report describes the achievements made in the field of network and capacity development, the technical improvements and outputs from the International Waterbird Census (IWC).

The partnership approach enabled the provision of technical and financial support to the development of waterbird monitoring schemes in a large number of AEWA Parties and non-Party Range States and maintenance of the network and regular data flow. However, funding for waterbird monitoring is still highly uncertain and insufficient, while the draft AEWA Strategic Plan 2019-2027 has increased the requirements concerning monitoring.

Both the 8th edition of the AEWA Conservation Status Report (document AEWA/MOP 8.19) and the Monitoring Priorities for Waterbird Species and Populations of AEWA (document AEWA/MOP 8.27) show that an increase in the number of populations whose status is assessed based on adequate monitoring is hardly possible without the improvement of the monitoring of breeding bird populations in the African and Asian parts of the Agreement Area. Understanding the causes of population changes will require paying more attention to demographic monitoring and monitoring of pressures.

The Waterbird Monitoring Partnership has established the Waterbird Fund as requested by Resolution 6.3 in 2016 but only one Contracting Party (Switzerland) has contributed to it so far and only a small number of other Contracting Parties (France, the Netherlands, Norway, Switzerland, Sweden, the United Kingdom and the European Union) have supported waterbird monitoring activities in other countries or at the flyway level. While the increase in external support is needed to provide coordination and capacity building, more national governments should also take more responsibility and invest into the running costs of their national monitoring schemes even in low- and medium-income countries.

Background

As described in document AEWA/MOP 5.42 Rev.1 (*Strategic Development of the Waterbird Monitoring in the African-Eurasian Flyways*), waterbird monitoring is an essential tool for the implementation of the Agreement in many respects, however, the capacity at site, national and international level is insufficient for adequate monitoring of waterbird populations in the Agreement area.

Although the 8th edition of the AEWA Conservation Status Report (CSR8) recorded an increase in the number of population whose status can be assessed based on monitoring (from 40% to 54%), it is still below the target of 2/3 of the populations set by the AEWA Strategic Plan 2019–2027.

Recognising that inadequate funding represents a major impediment to the future development of waterbird monitoring activities across the flyway, which are needed for mobilising and curating information needed for the compilation of the AEWA Conservation Status Reports, the Meeting of the Parties adopted Resolution 5.22 on *establishing a long-term basic structural funding regime for the international waterbird census in the African-Eurasian region*.

Operative paragraph 1 of this resolution *"Invites the Technical Committee to work with the Waterbird Monitoring Partnership to make progress towards the monitoring-related targets of the AEWA Strategic Plan 2009-2017 and to report to MOP6 and, if required, to propose this issue to be revisited at MOP6 with the aim to secure a long-term, sustainable solution for international waterbird monitoring"*.

Operative paragraph 3 of Resolution 6.3 has invited the organisations participating in the Waterbird Monitoring Partnership to jointly establish a Fund to resource waterbird monitoring activities and urged Parties to regularly contribute to it and operative paragraph 5 invited the Waterbird Monitoring Partnership to report to each session of the MOP on the amount raised, the use of resources and remaining gaps as broader reporting on the development of waterbird monitoring.

This report outlines the progress made since the 7th Session of the Meeting of the Parties to AEWA (MOP7) and assesses the long-term adequacy and sustainability of the current arrangements.

Organisational development

The *Strategic Working Group of the African-Eurasian Waterbird Monitoring Partnership*, established in 2011, continued to meet annually and has slightly expanded its membership. The Strategic Working Group includes organisations with a long-term strategic interest in the development of waterbird monitoring at regional, sub-regional or flyway scale¹.

It is chaired by Dr Johan Mooij as representative of the Member Delegates of Wetlands International and includes the UNEP/AEWA Secretariat, BirdLife International, the British Trust for Ornithology (BTO), the European Bird Census Council (EBCC), the Federation of Associations for Hunting and Conservation of the European Union (FACE), the French Biodiversity Agency (OFB), the Dutch Centre for Field Ornithology (Sovon), Tour du Valat Research Institute (TdV), EuroNatur, the Data Centre for the AEWA European Goose Management Platform based at Aarhus University, the Wildfowl and Wetlands Trust (representing the WI/IUCN SSC Species Specialist Groups), Joint OSPAR/HELCOM/ICES Working Group on Seabirds (JWGBIRD) and Wetlands International.

Regional meetings of the national International Waterbird Census (IWC) coordinators from Africa and the Western Palearctic elected their representatives for the Strategic Working Group in 2016 during the Pan-African Ornithological Congress in Senegal in 2016² and the EBCC conference BirdNumbers 2019 in Portugal.

¹ <https://europe.wetlands.org/our-network/waterbird-monitoring-partnership/>

² The PAOC in November 2020 was postponed to 2022 because of the COVID-19 pandemic.

The *Waterbird Fund* has been established as a separate bank account hosted and managed by Wetlands International in agreement with the Waterbird Monitoring Partnership in October 2016. A website³ was developed in 2017 with the financial support from the Swiss Ornithological Institute.

A regularly updated website⁴, quarterly newsletters and an active mailing list facilitate the exchange of information amongst the national coordinators and wider group of stakeholders including AEWA and Ramsar National Focal Points.

Major projects and initiatives that have contributed to strengthening the national waterbird monitoring schemes:

- 1) The *Wadden Sea Flyway Initiative*, coordinated for the flyway monitoring by Sovon (in cooperation with Wetlands International and BirdLife International) supported 17 coastal countries from Mauritania to Angola
- 2) The *Mediterranean Waterbirds Network Project*, coordinated by Tour du Valat and by the French Biodiversity Agency (OFB), supported the five countries of North Africa and Turkey;
- 3) The *Adriatic Flyway Initiative*, led by EuroNatur, has supported Albania and countries of the former Yugoslavia;
- 4) Wetlands International has organised *counts at Barr al Hikman, Oman*, with the help of Shell in 2018, 2019 and 2020 and also in the *Rufiji Delta, Tanzania* in 2019;
- 5) A coordinated census of marine waterbirds in the Baltic Sea was undertaken in January 2020 and 2021, organised by Joint OSPAR/HELCOM/ICES Working Group on Seabirds and with the support of the region's governments and HELCOM;
- 6) A three-year project, led by Wetlands International and supported by the MAVA Foundation, is being implemented in *Mauritania, Senegal, The Gambia and Guinea-Bissau to strengthen the IWC* in those countries;
- 7) The Food and Agriculture Organization of the United Nations (FAO), the OFB, and the French Facility for Global Environment (FFEM), as well as other partners have launched the "Strengthening expertise in Sub-Saharan Africa on birds and their rational use for communities and their environment" (RESSOURCE, also co-funded by EU) to assess the sustainability of the livelihood use of waterbirds in the Senegal River Valley, the Inner Niger Delta, Lake Chad basin and parts of the Nile basin.

As the result of such support, countries' participation and willingness to report their observations has been maintained at the improved level achieved earlier (Figures 1 and 2). However, support to counts and national capacity building activities in low- and medium-income countries outside of these projects was not possible. The majority of the support was available to West Africa and the Mediterranean and no support could be provided to Eastern Europe, Southwest Asia and Southern and Eastern Africa.

Flyway level coordination was supported by voluntary contributions from the Swiss Federal Office for the Environment (2018-2020), the Norwegian Environmental Protection Agency (2018-2019) and the EU LIFE+ NGO Operational Grant (2018-2021). At the time of writing, funding for the coordination position at Wetlands International was only secured from the EU LIFE+ NGO Operational Grant for 2021.

³ <https://waterbird.fund/>

⁴ <https://europe.wetlands.org/our-approach/healthy-wetland-nature/african-eurasian-waterbird-census/>

Ongoing data acquisition and curating was funded by Wetlands International, which ensured timely production of annual count total reports and was fundamental in maintaining the trust of the network of coordinators rebuilt during 2011-2014.

Technical improvements

In 2020, development of a new trend analysis method based on R-INLA has been attempted with the support of the Joint Nature Conservation Committee (UK), but this method was shown to be unsuitable for analysing trends of IWC data. Therefore, the trend analysis methodology based on TRIM was still used for the CSR8. The results of the 2020 IWC trend analysis are now also available on the IWC Online portal⁵.

Support from EU NGO Operational Grant, from Switzerland and from the Netherlands has allowed the production of a paper on Monitoring Priorities for Waterbird Species and Populations of AEWA (document AEWA/MOP 8.27) that was first requested by Contracting Parties at MOP5.

Impact

As a result of reorganising the scheme coordination, embracing the partnership approach and the technical improvements, it was possible to keep the time lag between the last year of the trend period used for trend analysis in the AEWA Conservation Status Report at “only” three years as opposed to the five-year gap in CSR5. The main limitation of further improvement is the ability of the larger schemes in Europe and South Africa to collect and process their data from their observers. Smaller schemes now can report within the same year as the counts.

Annual IWC count totals have been produced every year since 2011 and are available on the IWC Online portal⁶.

Population size and trend estimates are produced for the AEWA Conservation Status Reports. In 2021, the 1% thresholds were also updated if they have changed by more than 20% since the last comprehensive update in 2012. The Waterbird Population Estimates (WPE) are now published in a searchable online database⁷. The online database also allows for consultation with the expert networks. With the support of the Environment Agency of Abu Dhabi, a new WPE portal has been developed and launched in June 2021⁸.

Since 2018, 23 new data requests were served, and 24 scientific articles or reports (see full list in Appendix) were published. These addressed a wide range of issues ranging from single species to global change.

The status of 54% of the AEWA populations could be analysed based on monitoring data according to CSR8. Although this represents a 35% increase compared to CSR7 in 2018 and has increased by 116% compared to 2008, it is still well below the two-third target set in Target 1.4 of the AEWA Strategic Plan 2019–2018. This was not only the result of the improvement in the IWC, but also of the data mobilisation for the Art. 12 reporting under the EU Birds Directive and the European Red List of Birds projects.

The IWC trend analyses produced for the Conservation Status Report, Annex 1 to the CSR and the paper on Monitoring Priorities for Waterbird Species and Populations of AEWA all clearly shows that further improvement of population size and trend estimates depend on:

⁵ <http://iwc.wetlands.org/index.php/aewatrends8>

⁶ <http://iwc.wetlands.org>

⁷ <http://wpe.wetlands.org>

⁸ <https://waterbird-population.vercel.app>

- (1) Improving the regularity of waterbird counts in Africa (especially in the Sahel and East Africa) as well as in Central & South-west Asia;
- (2) Promoting adequate breeding bird monitoring schemes and assessment processes in Africa and the Asian parts of the Agreement area.

Funding and its sustainability

With the exception of the special counts and the support to counts in low-income countries, the financial targets set out in document AEWA/MOP 5.42 were largely met (Table 1). In total, € 1.204,000 was raised for various components in 2020, i.e. the last full year of the triennium representing an average annual budget across the last three years, which is positive.

However, apart from the funding from Wetlands International to data management, most funding is project-based and short- or maximum medium-term without any guarantee of long-term sustainability with the exception of the Wadden Sea Flyway Initiative. Luckily, the support to the flyway level coordination has been rather stable and predictable over the last triennium thanks to the annual contributions of the European Commission, Switzerland and Norway.

The bulk of the funding was dedicated to capacity building projects in the East Atlantic and the Black Sea-Mediterranean flyways.

Long-term funding through the capacity-building projects is also insecure with the exception of the East Atlantic Flyway where the Dutch government is committed to continue the funding of the flyway monitoring through the Wadden Sea Flyway Initiative. Key donors, such as the MAVA Foundation, are closing down in the foreseeable future. These projects all contributed to raising capacity, but this capacity can rapidly erode when funding is no longer available and there are little signs that this support can be replaced fully by in-country support. This results in irregular and insufficient coverage of key sites, which leads to highly fluctuating and uncertain population size and trend estimates at flyway level. Unfortunately, there is still a disconnect between capacity building for monitoring and using the information generated by national monitoring activities in reporting on population status to AEWA.

Both the experience with capacity building and the incomplete surveys conducted during the last years amongst Contracting Parties and IWC coordinating organisations indicate that the financial estimates in document AEWA/MOP 5.42 significantly underestimated the costs for the IWC not to mention the financial needs of additional monitoring schemes in low- and medium-income countries.

The Waterbird Fund raised over 280,000 EUR by June 2021 since the establishment of the Fund in 2016. Over the last triennium since July 2018 the amount raised is 140,000 EUR.

Figure 1. Latest year of data available in the IWC database as of May 2021. This map shows how up-to-date the IWC data is for international analyses.

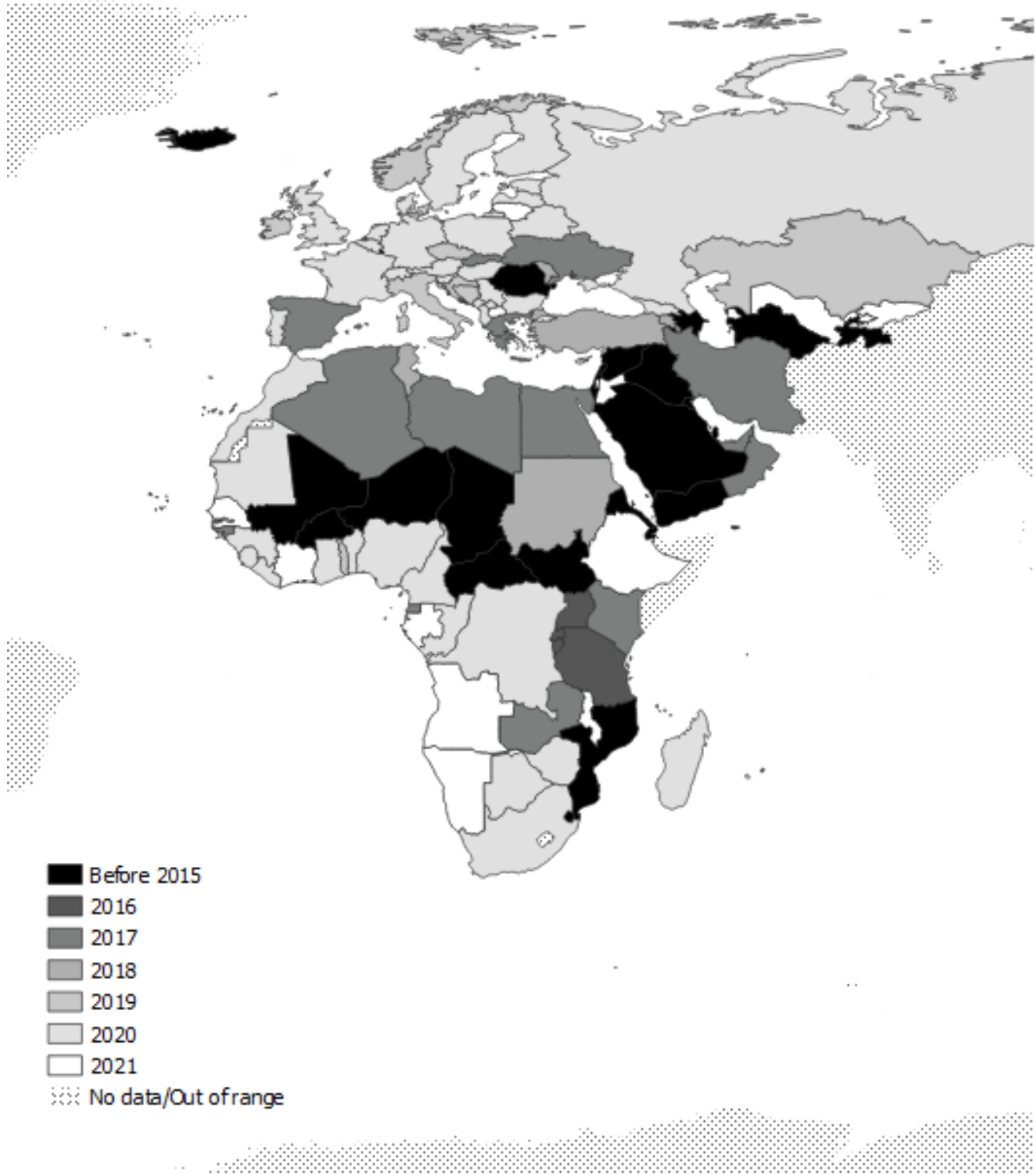


Figure 2. Latest year any data was submitted to the IWC database as of May 2021. This map shows the recency of communicating IWC data to Wetlands International. The comparison of Figure 1 and 2 shows the lag between data collection and data submission.

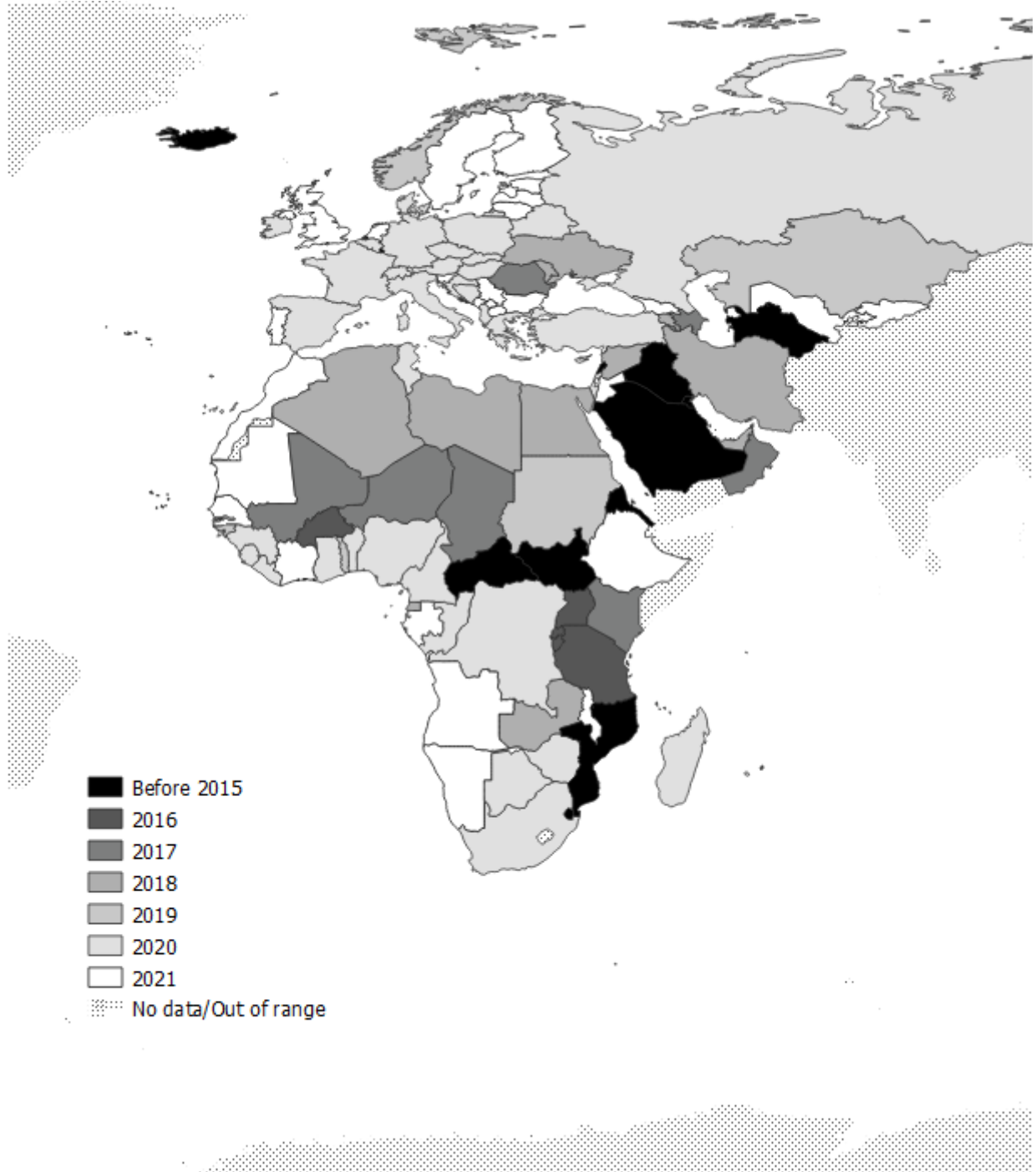


Table 1. Financial overview compared to the estimates in document AEWA/MOP 5.42.

Component	Total estimated (all costs x1,000 EUR)	Realised in 2020 (all costs x1,000 EUR)	Comments
Annually recurring activities			
Global coordination and data management	100	100	Association of the Members of Wetlands International
Basic regional coordination	65	58	Supported by the EU LIFE+ NGO Operational Grant, voluntary contributions of Switzerland and Norway.
IWC coordinators' meeting (one meeting per region every three years, ideally three regions: Africa, Europe, Central & South-west Asia)	30	n/a	Not applicable in 2020. However, the BirdNumbers 2019 Conference took place in 2019, which was possible with the support of the EU LIFE NGO Grant. The PAOC has been postponed to 2022.
Capacity development in countries with insufficient coverage of key sites	min. 40	c. 657	Wadden Sea Flyway Initiative: € 210,000 in 2018-2020 (i.e € 70,000 annually) supported by the Dutch Ministry Agriculture, Nature and Food Security the German Wadden Sea National Parks of Lower Saxony and Schleswig-Holstein, Danish Ministry of Environment, Vogelbescherming Netherlands and the UK WeBS programme; Mediterranean Waterbirds Network: € 182,000, supported by the French Ministry for the Ecological Transition, Tour du Valat, OFB (ex-ONCFS), French Agency of Developpement (AFD), Frech Fund for World Environnement (FFEM), Total Foundation; Sahelian wetlands Waterbirds monitoring: in 2021, ca. € 300,000 supported by the four-year FFEM/FAO/EU RESSOURCE project (€ 1,200,000 for the total duration of the project) plus € ca. 50,000 funded by the French Ministry for the Ecological and Inclusive

Component	Total estimated (all costs x1,000 EUR)	Realised in 2020 (all costs x1,000 EUR)	Comments
			Transition as support for the Technical Support Unit (TSU) ⁹ (€ 760,000 between 2013 and 2017) plus two engineers from OFB part time (ca. 70%, i.e. ca. €100,000 per year); Additional contributions of € 201,050 from the MAVA Foundation for the Adriatic Flyway and over € 100,000 in West Africa. The government of Sharja has supported a regional training workshop for the Arabian Peninsula by € 5,000
Small grants for general IWC counts in developing countries	min. 80	22	€ 22,000 for count at Barr al Hikman, Oman, supported by Wetlands International and Shell;
Goose and swan counts	min. 22	103	In addition to the goose monitoring implemented under the European Goose Management Platform (€ 96,000), WWT and Wetlands International European Association have supported an aerial survey of wintering swans in the Volga Delta by € 7,000
Seaduck counts coordination	min. 16	0	
Total of annual costs	min. 353	940	

⁹ The Technical Support Unit (TSU) to the African Initiative of AEWA was established in 2012 at the AEWA MOP5, with the support of the French Ministry of Ecology (MEDDE) and is made up of personnel from the French Hunting and Wildlife Office (ONCFS), Tour du Valat and Senegal's National Parks Directorate (DPN of Senegal).

Component	Total estimated (all costs x1,000 EUR)	Realised between 2019 and 2021 (all costs x1,000 EUR)	Comments
Triennial costs			
Seaduck counts	85	0	The estimated cost of the whole Baltic – North Sea census is estimated over € 1 million.
Tidal wetland counts in Africa and the Middle East	70	0	WSFI contributed to this in West Africa and the counts organised by Wetlands International in Oman and Tanzania
AEWA Conservation Status Report	55	100	UNEP/AEWA Secretariat
CSN Tool update	50	12	Technical development of CSN 2.0 supported by the government of the UK
Waterbird Population Estimates	min. 30	147	Development of the Waterbird Population Portal ¹⁰ funded by the Environment Agency of Abu Dhabi.
Policy relevant indicators	n/a	0	
Special analyses	n/a	15	IWC trend analysis methodology review paid by the JNCC, UK.
Total periodic costs	290	254	

Keys:

min.: indicates a minimum cost estimate, but projects with enhanced content may actually cost more.

n.a.: indicates that the activity responds to needs to be defined bilaterally and it is not possible to estimate the costs here.

¹⁰ <https://waterbird-population.vercel.app/>

Appendix: List of publications that used the IWC data and IWC data requests

2021

1. Suet, M., Lozano-Arango, J.G., Defos Du Rau, P., Deschamps, C., Abdalgader Mohammed, M.A., Elbashary Adam, E., Mohammed Eldegair, E., Ali Elbadawi, M.E., Mohammed Hashim, I., Kirrem Kpoore, N., Mohammed, M.A., Mohammed Ibrahim Bihery, M., Adam, M.E.A., Pineau, O. and Mondain-Monval, J.-Y. (2021), Improving waterbird monitoring and conservation in the Sahel using remote sensing: a case study with the International Waterbird Census in Sudan. *Ibis*, 163: 607-622. <https://doi.org/10.1111/ibi.12911>
2. Ouassou, A., Dakki, M., El Agbani, M. A., & Qninba, A. (2021). Distribution and Numbers of Three Globally Threatened Waterbird Species Wintering in Morocco: The Common Pochard, Marbled Teal, and White-headed Duck. *International Journal of Zoology*, 2021
3. Nagy, S., Breiner, F.T., Anand, M., Butchart, S.H.M., Flörke, M., Fluet-Chouinard, E., Antoine Guisan, A., Hilarides, L., Jones, V.R., Kalyakin, M., Lehner, B., Pearce-Higgins, J.W. & Olga Voltzit, O. (2021). Climate change exposure of waterbird species in the African-Eurasian flyways. *Bird Conservation International*, 1-26.
4. Johnson, F. A., & Koffijberg, K. (2021). Biased monitoring data and an info-gap model for regulating the offtake of greylag geese in Europe. *Wildlife Biology*, 2021(1), wlb-00803.
5. Dakki M., Robin G., Suet M., Qninba A., El Agbani M.A., Ouassou A., El Hamoumi R., Azafzaf H., Rebah S., Feltrup-Azafzaf C., Hamouda N., Ibrahim W.A.L., Asran H.H., Elhady A.A., Ibrahim H., Etayeb K., Bouras E., Saied A., Glidan A., Habib B.M., Sayoud M.S., Bendjedda N., Dami L., Deschamps C., Gaget E., Mondain-Monval J., Defos du Rau P. 2021. Imputation of incomplete large-scale monitoring count data via penalized estimation. *Methods Ecol Evol*:2041–210X.13594. doi: 10.1111/2041-210X.13594

2020

1. Gaget, E., Le Viol, I., Pavón-Jordán, D., Cazalis, V., Kerbiriou, C., Jiguet, F., Popoff, N., Dami, L., Mondain-Monval, J., Defos Du Rau, P., & Abdou, W., Bozic, L., Dakki, M., Encarnaçao, V., Erciyas Yavuz, K., Etayeb, K., Molina, B., Petkov, N., Uzunova, D. & Galewski, T., (2020). Assessing the effectiveness of the Ramsar Convention in preserving wintering waterbirds in the Mediterranean. *Biological Conservation*. 243. 108485. 10.1016/j.biocon.2020.108485.
2. Pavón-Jordán, D., Azafzaf, H., Balaž, M., Bino, T., Borg, J., Božič, L., Butchart, S., Sniauksta, L., Devos, K., Domsa, C., Encarnaçao, V., Faragó, S., Gaudard, C., Georgiev, V., Goratze, I., Kostiuszyn, V., Langendoen, T., Ieronymidou, C., & Lewis, L. & Etayeb, K. (2020). Positive impacts of important bird and biodiversity areas on wintering waterbirds under changing temperatures throughout Europe and North Africa. *Biological Conservation*. 246. 10.1016/j.biocon.2020.108549.
3. Amano, T., Székely, T., Wauchope, H., Sandel, B., Nagy, S., Mundkur, T., Langendoen, T., Blanco, D., Michel, N. & Sutherland, W. (2020). Responses of global waterbird populations to climate change vary with latitude. *Nature Climate Change*. Volume 10, 959–964
4. Gaget, E., Pavón-Jordán, D., Johnston, A., Lehikoinen, A., Hochachka, W., Sandercock, B., Soultan, A., Azafzaf, H., Bendjedda, N., Bino, T., Božič, L., Clausen, P., Dakki, M., Devos, K., Domsa, C., Encarnaçao, V., Erciyas Yavuz, K., Faragó, S., Frost, T. & Brommer, J. (2020). Benefits of protected areas for nonbreeding waterbirds adjusting their distributions under climate warming. *Conservation Biology*. 35. 10.1111/cobi.13648.

5. Marchowski, D., Ławicki, Ł., Fox, A. D., Nielsen, R. D., Petersen, I. K., Hornman, M., Nilsson, L., Haas, F., Wahl, J., Kieckbusch, J., Nehls, H., Calbrade, N., Hearn, R., Meissner, W., Fitzgerald, N., Luigujõe, L., Zenatello, M., Gaudard, C. & Koschinski, S. (2020). Effectiveness of the European Natura 2000 network to sustain a specialist wintering waterbird population in the face of climate change. *Scientific reports*, 10(1), 1-12.

6. van Roomen M., Agblonon G., Langendoen T., Citegetse G., Diallo A. Y., Gueye K., van Winden E. & Luerssen G. (eds.) 2020. *Simultaneous January 2020 waterbird census along the East Atlantic Flyway: National Reports*. Wadden Sea Flyway Initiative p/a Common Wadden Sea Secretariat, Wilhelmshaven, Germany, Wetlands International, Wageningen, The Netherlands, BirdLife International, Cambridge, United Kingdom.

2019

1. Laubek, B., Clausen, P., Nilsson, L., Wahl, J., Wieloch, M., Meissner, W., Shimmings, P., Larsen, B.H., & Hornman, M., Rees, E. & Fox, A.D. (2019). Whooper Swan *Cygnus cygnus* January population censuses for Northwest Mainland Europe, 1995–2015. *Wildfowl, Special Issue 5: 103-122*.

2. Ashoori, A., Amini, H., Khaleghizadeh, A., Manolopoulos, A., & Catsadorakis, G. (2019). What caused the strong increase of the winter population of the Dalmatian Pelican, *Pelecanus crispus*, in Iran in the last two decades? *Zoology in the Middle East*, 65(4), 307-318.

3. Rees, E. C., Cao, L., Clausen, P., Coleman, J. T., Cornely, J., Einarsson, O., Ely, C., Kingsford, R., Ma, M., Mitchell, C., Nagy, S., Shimada, T., Snyder, J., Solovyeva, D., Tijssen, W., Vilina, Y., Wlodarczyk, R. & Brides, K. (2019). Conservation status of the world's swan populations, *Cygnus* sp. and *Coscoroba* sp.: a review of current trends and gaps in knowledge. *Wildfowl, Special Issue 5, 35-72*.

4. Melfo, H., Durinck, J., Jakobsen, B., Nordstrøm, C., & Rigét, F. F. (2019). Trends in the autumn passage numbers of Arctic and boreal waders in W Denmark 1964–2017 as a contribution to East Atlantic Flyway population trends. *Ardea*, 107(2), 197-211.

5. Beekman, J., Koffijberg, K., Wahl, J., Kowallik, C., Hall, C., Devos, K., Clausen, P., Hornman, M., Laubek, B., Luigujõe, L., Wieloch, M., Boland, H., Švažas, S., Nilsson, L., Stipniece, A., Keller, V., Gaudard, C., Degen, A. & Rees, E. (2019). Long-term population trends and shifts in distribution of Bewick's Swans *Cygnus columbianus bewickii* wintering in northwest Europe. *Wildfowl*, 73-102.

2018

1. Huang, Z.Y.X., Xu C., van Langevelde, F., Langendoen, T., Mundkur, T., Huaiyu Tian, Y.S., Kraus, R.H.S, Gilbert, M., Han G-Z., Ji, X., Prins, H.H.T & de Boer W.F.: Contrasting effects of host species and phylogenetic diversity on the occurrence of HPAI H5N1 in European wild birds. Submitted to Proceedings of the Royal Society B Biological Sciences 6/3/2018

2. Clark, R., Guillemain, M., Drever, M., Messmer, D. & Langendoen, T.: Cross-continental effects of climate cycles on avian population synchrony and dynamics. Currently pending submission.

3. Amano, T., Székely, T., Sandel, B., Nagy, S., Mundkur, T., Langendoen, T., Blanco, D., Soykan, C.U. and Sutherland, W.J. (2018) Successful conservation of global waterbird populations depends on effective governance. *Nature* 553: 199–202. <http://dx.doi.org/10.1038/nature25139>

4. Gaget, E., Galewski, T., Jiguet, F., & Le Viol, I. (2018). Waterbird communities adjust to climate warming according to conservation policy and species protection status. *Biological Conservation*, 227, 205-212.

5. Pavón-Jordán, D., Clausen, P., & Dagys, M., Devos, K., Encarnação, V., Fox, A.D., Frost, T., Gaudard, C., Hornman, M., Keller, V., Langendoen, T., Ławicki, Ł., Lewis, L., Lorentsen, S-H., Luigujõe, L., Meissner, W., Molina, B., Musil, P., Musilová, Z. & Lehtikoinen, A.. (2018). Habitat- and species-mediated short- and long-term distributional changes in waterbird abundance linked to variation in European winter weather. *Diversity and Distributions*. 25. 10.1111/ddi.12855.

6. Musilová, Z., Musil, P., Zouhar, J., & Adam, M. (2018). Changes in habitat suitability influence non-breeding distribution of waterbirds in central Europe. *Ibis*, 160(3), 582-596.

7. Ouassou, A., Dakki, M., Lahrouz, S., El Agbani, M. A., & Qninba, A. (2018). Status and Trends of the Ferruginous Duck's (*Aythya nyroca*) Wintering Population in Morocco: Analysis of 35 Years of Winter Census Data (1983-2017). *International Journal of Zoology*, 2018.

8. van Roomen M., Nagy S., Citegetse G. & Schekkerman H. 2018 (eds). *East Atlantic Flyway Assessment 2017: the status of coastal waterbird populations and their sites*. Wadden Sea Flyway Initiative p/a CWSS, Wilhelmshaven, Germany, Wetlands International, Wageningen, The Netherlands, BirdLife International, Cambridge, United Kingdom

2017

1. Pavón-Jordán, D., Fox, A.D., Clausen, P., Dagys, M., Gaudard, C., Devos, K., Encarnação, V., Frost, T., Hornman, M., Keller, V., Langendoen, T., Lorentsen, S-H., Luigujõe, L., Ławicki, Ł., Meissner, W., Molina, B., Musil, P., Musilová, Z., Nilsson, L., Paquet, J-Y., Stipniece, A., Ridzon, J., Lewis, L., Teufelbauer, N., Wahl, J., Zenatello, M., Lehtikoinen, A. 2015. Short- and long-term changes in the distribution of abundances linked to variation in winter weather conditions in Europe differ between species with different habitat preferences. Submitted to *Diversity and Distributions* 11/12/2017

2. Hilarides, L., Langendoen, T., Flink, S., van Leeuwen, M., Steen, B., Kondratyev, A., Kolzsch, A., Aarvak, T., Kruckenberg, H., Vangeluwe, D., Todorov, E., Harrison, A., Rees, E., Dokter, A., Nolet, B. & Mundkur, T.: Mapping critical habitat of waterbirds in the Arctic for risk management in respect of IFC PS6. In submission, see <https://www.biorxiv.org/content/early/2017/10/20/206763>

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2014

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2012

1. Harebottle, D.M. 2012. Assessing the Conservation Value of Wetlands and Waterbirds with a Focus on the Winter Rainfall Region of South Africa. Ph.D. Thesis. University of Cape Town: South Africa.
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Data requests:

2021

1. Jonah Gula: African stork niche breadth.
2. Réserves Naturelles de France: Comparison of shorebird populations trends from local to European scale during winter.
3. Natural History Museum, London: Linking earth observation of wetlands to bird counts in the Rift Valley.

2020

1. Swedish University of Agricultural Sciences: Conservation policy in a changing world: integrating citizen science data from national monitoring schemes to model impacts of global change scenarios.
2. Dagmar Cimiotti: Winter distribution of Common Shelducks (*Tadorna tadorna*).
3. Smithsonian Institution: Quantifying landscape multifunctionality: a comparative approach.
4. JNCC: AEWA Waterbird Trend Analysis – Methodology Review.
5. French Biodiversity Agency: Greylag Goose in Europe.
6. Andrej Vizi: Dalmatian Pelican population dynamics on Skadar Lake in the function of local and regional ecological factors.

2019

1. University of Queensland, Australia: Assessing long-term changes in global waterbird diversity.
2. Donana Biological Station: Eurasian Curlew data.
3. İlker Özbahar: Greater flamingo wintering distribution.
4. İlker Özbahar: White-headed Duck wintering distribution.
5. Jonah Gula: Population ecology of Saddlebills in the Greater Kafue Ecosystem, Zambia.

6. Nanjing Normal University: The role of community phylogenetic structure of waterbirds in H5N8 outbreaks in Europe.
7. Wageningen University: Comparing the drivers of changes in waterbird community in China and Europe.
8. University of Turku: Conservation policy in a changing world: integrating citizen science data from national monitoring schemes to model impacts of global change scenarios
9. Miguel Hernández de Elche University: Movement ecology of Marbled Teal and population trends

2018

1. Cambridge University: Understanding global drivers of waterbird population change (PhD project).
2. Tour du Valat, France: Conservation of the wintering waterbirds in the Mediterranean basin.
3. University of Helsinki: Flyway-level population dynamics of few duck species.
4. Sovon: East Atlantic Flyway Assessment 2017.
5. Raf Vervoort: Global distribution of Ruff during the Northern winter.

2017

1. University of Helsinki: Assessing waterbird distributions in relation to EU protected areas across the entire north-west and the central-Mediterranean populations.
2. Society for the Protection of Prespa. Conservation of pelicans in Greece and SE Europe.
3. Doñana Biological Station-CSIC: Flamingos and drought as drivers of nutrients and microbial dynamics in a saline lake.
4. Université Paris-Sud: Relative importance of climate and nutrients as predictors of the size of waterbird populations.
5. Charles University: Comparison of Czech trends with Western Palearctic
6. ONCFS: Trend of selected waterbird populations in the NW Mediterranean

2016

1. ONCFS: Demographic functioning of hunted populations with the example of Common pochard and Tufted duck in Western Europe (PhD project)
2. NIOO-KNAW: Annual cycle of Bewick's Swan in search for the cause of its decline.

2015

1. Goose Specialist Group: Update of population estimates for Bean Geese wintering in Europe
http://www.wetlands.org/Portals/0/Rap_2012-22_FlywaytrendsTotaalLR.pdf

2014

1. Society for the Protection of Prespa. Conservation of pelicans in Greece and SE Europe.
2. Cormorant Specialist Group (EU project CorMan): Pan-European roost count Great Cormorant, January 2013.
3. Division of Biology & Conservation Ecology, School of Science & the Environment, Manchester Metropolitan University: The Conservation and Management of Selected Hunttable Bird Species in Europe
http://www.wetlands.org/Portals/0/Rap_2012-22_FlywaytrendsTotaalLR.pdf

2013

1. ONCFS. PhD thesis: Influence of post-harvest agricultural practices on rice field use by wintering ducks
Wetlands International Foundation: Iraqi Marshlands World Heritage comparative analysis
http://www.wetlands.org/Portals/0/Rap_2012-22_FlywaytrendsTotaalLR.pdf

2012

1. Ligue pour la Protection des Oiseaux. Trend analysis of non-breeding birds in France.
2. Alterra Wageningen UR. Econet-flyways - analysis on flyway patterns
3. Wildfowl & Wetlands Trust: Understanding trends and distribution changes in wintering Red-breasted Goose
4. Sovon: Naar een effectief en internationaal verantwoord beheer van de in Nederland overwinterende populatie Kolganzen (*Anser albifrons*)
5. Centre d'Etudes Biologiques de Chizé UPR : Distribution and decline of Common and Brown Scoters in the Western Palaearctic region.
6. ONCFS: Redaction of a monograph on Teal (*Anas crecca*)

2011

1. NOWAC initiative: Long-term trends in ecosystem effects on food quality and abundance, and the consequences for population trends in migratory waterbirds.
3. IMARES PhD thesis: Trends of wintering Scaup in North-west Europe
4. CNRS: Influence of global changes on wader communities
5. University Lille: Spatio-temporal evolution of the migration of sea ducks in European coasts.
6. Doñana Biological Reserve Station: Long distance dispersal of aquatic organisms by waterbirds
7. Centre for Ecological Research and Forestry Applications (CREAF): Shorebird populations trends