# Capacity building assessment and strategic framework for waterbird monitoring of the East Atlantic Flyway coastal zone of Africa



THE WADDEN SEA FLYWAY INITIATIVE

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**Photographs cover:** front: Tim Dodman (training workshop, Cap Blanc, Mauritania). Inserts: NCD (Field training, Technopôle, Dakar); Tim Dodman (Greater Flamingos & Lesser Black-backed Gulls)
back: Paulo Catry (training workshop, Bijagós Archipelago, Guinea-Bissau)

# Contents

# Summary

This document provides an assessment of past efforts in building capacity for waterbird monitoring, evaluates current capacity and proposes lessons learned and a strategic framework for building and maintaining capacity for waterbird monitoring into the future along the African part of the East Atlantic Flyway. The assessment was conducted through interviews and a review of past and ongoing initiatives that focused on or included capacity building for waterbird monitoring. There were also two national evaluation workshops (Mauritania and Guinea-Bissau) and a field evaluation (Senegal).

Short conclusions have been formulated based on the assessment, supported by a series of lessons learned. They highlight the need for strong institutions and partnerships, and to enhance the value of monitoring and the use of results for management. They also recommend strongly investing in building networks of motivated observers, and highlight the benefits of training and experiential learning. Training and network support are key to promoting sustainability of monitoring programmes into the future, along with innovative fundraising. The document concludes with a strategic framework, which provides a list of proposed actions that could contribute best practice for building future capacity in monitoring waterbirds along the East Atlantic Flyway in Africa.

# *Resumé*

*Ce document présente une évaluation des efforts passés en matière de renforcement des capacités pour le suivi des oiseaux d'eau, analyse les capacités actuelles et propose des enseignements tirés ainsi qu'un cadre stratégique pour renforcer et maintenir, à l'avenir, les capacités de suivi des oiseaux d'eau le long de la partie africaine de la voie de migration Est-Atlantique. L'évaluation a été réalisée à travers des entretiens et un examen des initiatives passées et en cours qui étaient axées sur le renforcement des capacités pour le suivi des oiseaux d'eau ou qui l'ont inclus. Deux ateliers d'évaluation nationaux (Mauritanie et Guinée-Bissau) et une évaluation sur le terrain (Sénégal) ont également été organisés.*

*De brèves conclusions ont été formulées sur la base de l'évaluation et appuyées par une série de leçons apprises. Celles-ci soulignent la nécessité de disposer d'institutions et de partenariats solides, ainsi que de renforcer la valeur du suivi et l'utilisation des résultats pour la gestion. Elles recommandent également d'investir fortement dans la mise en place de réseaux d'observateurs motivés et mettent en évidence les avantages de la formation et de l'apprentissage par l'expérience. La formation et le soutien aux réseaux constituent des éléments clés pour promouvoir la durabilité des programmes de suivi à l'avenir, conjointement à des approches innovantes de mobilisation de fonds. Le document se conclut par un cadre stratégique qui propose une liste d'actions susceptibles de contribuer aux bonnes pratiques pour le renforcement des capacités futures en matière de suivi des oiseaux d'eau le long de la voie de migration Est-Atlantique africaine.*

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**Working with school pupils during a Training of Trainers workshop in Benin, 2019**

# 1. Introduction

## 1.1 Aims and presentation of the assessment

Effective monitoring of waterbirds requires competent teams of people, commitment and coordination, presenting the need for strong capacity at different levels. This document aims to assess past efforts, evaluate current capacity and propose a framework for building and maintaining capacity for waterbird monitoring along the African part of the East Atlantic flyway. This has been achieved through a comprehensive review of past and ongoing initiatives, a wide range of interviews, and national workshops focused on key sites.

Chapters 2 to 5 present an assessment of capacity building activities and current capacity for waterbird monitoring along the East Atlantic Flyway in Africa. Chapter 2 presents a number of regional initiatives, then a range of events and activities that included monitoring, and other inputs to building capacity, including the provision of equipment and research programmes. There is an analysis of the events and activities in Chapter 3. Chapter 4 presents an overview of capacity for waterbird monitoring at three key sites of the flyway, followed by results from a range of interviews with people engaged in monitoring or capacity building (Chapter 5).

This leads to an **overview of conclusions and lessons learned (Chapter 6)**, based on project reports, feedback from workshops and interviews and the analyses that form part of this report. Drawing on these, a **strategic framework for building and maintaining future capacity for waterbird monitoring along the East Atlantic Flyway in Africa (Chapter 7)** is presented. Definitions of terms used to focus this study and a list of acronyms are provided in Chapters 8 and 9, and a list of partners in Chapter 10. Annex 1 provides an illustrated list of events and actions conducted up to 2025.

## 1.2 The East Atlantic Flyway in Africa

The East Atlantic Flyway (EAF), used by millions of migratory waterbirds, connects breeding areas with staging and non-breeding sites on their annual cycle. The flyway stretches from the Arctic Circle (Northwestern Canada to Central Siberia) through Western Europe (mainly Atlantic and North Sea areas) to the entire Atlantic coastline of Africa. In Africa, the flyway comprises a diverse range of habitats that provide foraging and shelter for migratory birds, plus important breeding sites. Atlantic Africa's intertidal mudflats and sandflats are vital for migratory waders. Other coastal wetlands include lagoons, mangroves, river deltas and estuaries, floodplains, marshes and ricefields. This range of coastal wetlands provides important habitats for many waterbirds, especially waders, ducks, cormorants, pelicans, flamingos, herons, gulls and terns.

The flyway in Africa also supports a large human population and key industries such as fishing, energy production and tourism, whilst farming is widespread around many coastal wetlands. There is a network of coastal protected areas, from national parks to community reserves, and World Heritage Sites, such as Mauritania's Parc National du Banc d'Arguin and a part of the Bijagós Archipelago in Guinea-Bissau.


***Map of the East Atlantic Flyway, showing key breeding areas in the Arctic for long-distance migratory waders, the Wadden Sea stopover and two non-breeding sites in West Africa.***

## 1.3 Waterbird monitoring along the East Atlantic Flyway in Africa

Monitoring the numbers of animals in a population is a key part of managing species, and has been undertaken for waterbirds for many years. The first organised waterbird counts in West Africa were in 1958. French researchers led counts between the 1960s and 1980s, including aerial surveys and major coordinated efforts in the Senegal, Niger and Chad basins in 1984 (Roux & Jarry 1984), whilst IWRB began to coordinate Anatidae counts in 1967 (Perennou 1991). Various expeditions took place at key sites such as the PNBA, where breeding bird surveys were also undertaken (e.g. Campredon 1987). Several expeditions in West/ Atlantic Africa were organised by the Working Group International Waterbird and Wetland Research (WIWO), mostly focused on comprehensive waterbird counts. WIWO also conducted some surveys of breeding birds, including in Senegal (Keijl *et al.* 2000). WIWO published an impressive series of reports from its many expeditions from the 1980s onwards.

The establishment of the International Waterbird Census (IWC) as a global monitoring programme marked the start of annual synchronised counts of all waterbird species. Coordinated IWC counts are organised during January, when many species congregate in wet-

lands, and are used in estimating waterbird population sizes and assessing trends, thereby helping to track the health of waterbird populations and guide conservation and policy decisions. The IWC is coordinated internationally by Wetlands International and nationally or regionally by local partners.

The IWC became more regular and more widespread in Africa in the early 1990s, boosted by a regional workshop for IWC National Coordinators (NCs) in 1995 at the Parc National des Oiseaux du Djoudj (PNOD), Senegal, the results yielding a preliminary waterbird monitoring strategy for Africa (Dodman 1997). Wetlands International established its Africa office in Dakar, Senegal in 1998, which assumed a coordination role of the African Waterbird Census (AfWC), and a programme of regular January counts grew during the late 1990s. Monitoring efforts picked up again in the 2010s, when Wadden Sea Flyway Initiative (WSFI), BirdLife International and Wetlands International collaborated with other partners to support monitoring, including a three-yearly 'total' counts along the flyway, workshops to address issues such as data management and periodic assessments of waterbird trends and wetland pressures (van Roomen *et al.* 2015, van Roomen *et al.* 2018, van Roomen *et al.* 2022, van Roomen *et al.* 2025).

Waterbird monitoring and research programmes were built more deeply into a few key sites, where longer-term partnerships were established. In West Africa, this was particularly the case for PNBA, with the support of the Fondation International pour le Banc d'Arguin (FIBA), the Royal Netherlands Institute for Sea Research (NIOZ) and the University of Groningen (RUG), for PNOD, with support of the European Institute for the Management of Wild Birds and their Habitats (OMPO) and others, and for the Bijagós Archipelago in Guinea-Bissau, with support of the Common Wadden Sea Secretariat (CWSS), the University of Aveiro and others. A long-term series of monitoring also developed in Ghana, mainly through a national partnership led by the Centre for Biodiversity Conservation and Research (CBCR), formerly the Centre for African Wetlands.

The East Atlantic Flyway in Africa also supports breeding colonies of several waterbird species, notably terns and gulls, especially between Mauritania and Guinea and in offshore islands of the Gulf of Guinea. Monitoring these colonies is more effective than IWC counts for determining the population sizes and trends of these species, and such programmes developed in West Africa in the late 1990s.

## 1.4 Capacity for waterbird monitoring along the East Atlantic Flyway in Africa

Capacity for planning and conducting waterbird counts and using results of monitoring varies significantly along the flyway, and is often linked to financial and human resources, education, access to equipment, and governance. It also varies regularly over time, and is often dependent on factors that can be irregular, such as funding and changes in staffing arrangements or priorities. Maintaining and building capacity is thus a constant challenge for and a key element of monitoring, as it is for conservation in general. Capacity building provides the basis for conservation efforts at the local, national and international level through enhancing knowledge, strengthening institutions, empowering communities, and facilitating exchange on best practices.

The early pioneering efforts and short-term site surveys were largely expeditionary in nature, and rarely included significant efforts to build local or national capacity for monitoring, and all data analyses and reporting were conducted in Europe. Some local capacity gradually grew at a few sites where local protected areas staff accompanied European ornithologists during surveys, but most surveys were one-off or only carried out once a year, giving little opportunity for capacity growth. Since the 1990s, a number of regional projects and initiatives began to focus some attention to building capacity at different sites. At the same time, capacity was growing at a number of key sites through more regular long-term support for both research and monitoring programmes.

Investments have been made in building capacity for monitoring waterbirds and wetlands along the flyway for decades, but the approaches, effectiveness and longevity of efforts have varied considerably both at the site and the flyway level.

Tim Dodman

**Trainees counting birds at Baie de l'Étoile, Mauritania.**

# 2. Qualitative assessment of activities carried out along the East Atlantic Flyway in Africa that included capacity building for monitoring

This section presents an assessment of activities carried out along the East Atlantic Flyway in Africa that have included significant elements of capacity building for monitoring waterbirds. It includes a series of tables that provide an overview of activities carried out between 1996 and 2025, especially events led by international organisations or by local organisations within larger projects, with further information provided in Annex 1. Inevitably, some events will be missing from the tables, especially small site-based events that were not widely reported on.

An overview of regional projects and initiatives that have included capacity building components is presented in 2.1.1, while specific events that have addressed monitoring at some level are shown in 2.1.2, with the inclusion of a few more general workshops that have contributed in other ways, such as network development. A brief overview of 'Total' January Counts of coastal wetlands along the East Atlantic Flyway undertaken since 2014 is shown in 2.1.3, and research and integrated monitoring in 2.1.4, while 2.1.5 illustrates field guides and manuals that have played a role in strengthening capacity for monitoring in the region.

Some larger sites, such as PNBA and the Bijagós Archipelago, have seen a fairly long series of expedition-style surveys, usually with expert teams visiting from Europe. These gathered important information on the numbers and distribution of birds at these key sites, but training opportunities within these events have usually been limited, as the survey work itself was invariably intense. At some sites, there have been long-term, often seasonal, research programmes led by experts, which have invariably included capacity building, with the involvement of local staff. An example includes a long-term research programme carried out every (northern) winter at PNBA on waterbird, benthos and habitat ecology led by NIOZ and RUG. Undoubtedly, local staff associated with this programme have benefited significantly, and programmes like these play an important role in building capacity. However, the information presented here does not generally include 'training on the job', learning by doing or studentships, such as building capacity through PhD research, which are hard to capture in a tabular format. They also do not include regular monitoring or research activities, for instance when local staff join annual research programmes, unless the primary aim is building capacity.

## 2.1 Regional projects / initiatives significantly including capacity building

The first major regional project that focused on building capacity for wetlands and waterbirds conservation began in 1998, led by Wetlands International. The Wings Over Wetlands (WOW) project included development of a major capacity building tool, the Flyway Training Kit. Meanwhile Tour du Valat launched a long-term regional initiative for North Africa, which, of relevance to the EAF, included Morocco. BirdLife International also launched its two-phase Conservation of Migratory Birds (CMB) project, which focused on the region between Mauritania and Sierra Leone. The WSFI was launched in 2012, in answer to a request by the World Heritage Committee to the three Wadden Sea countries (Denmark, Germany and The Netherlands) to support activities along the flyways of birds that migrated through the Wadden Sea. This initiative had two main areas of focus – monitoring and capacity building. The monitoring component had always included capacity building elements, whilst the capacity building component has included projects that do not only focus on monitoring.

Table 1 provides a short description of regional projects and initiatives that have taken place along or including countries of the EAF in Africa.

The series of regional projects and initiatives have been largely responsible for starting up waterbird monitoring in many African countries and keeping it going. There is a strong incentive for international partnership and support for monitoring as many of the birds are shared resources between Africa and Eurasia, and such partnerships fit well with international frameworks, such as AEWA. Probably regional initiatives will be needed well into the future to maintain and develop monitoring programmes.

Paulo Catry

**Practice in the use of monitoring forms, Guinea-Bissau.**

**Table 1.** Regional projects / initiatives significantly including capacity building taking place along the East Atlantic Flyway in Africa between the 1990s and 2025

| Years | Region | Title | Capacity building activities | Lead |
|---|---|---|---|---|
| 1998-2002 | West Africa | Building the Capacity in West Africa of a Regional Network for Wetland and Waterbird Management, 1998-2002 | The project included outputs that national agencies planned and managed their own national wetland survey programmes and AfWC activities, and that agency personnel were trained in practical aspects of survey management (e.g. reporting, team management, coordination). It was also planned that people would be trained in technical aspects of wetland/ waterbird monitoring and management. The project further supported the AfWC in all countries, published AfWC reports and supported field surveys. Training courses were held in 15 countries, and a wetland and waterbird monitoring and training programme was launched in Guinea-Bissau. | WI |
| 2006-2011 | AEWA region | Wings Over Wetlands (WOW) UNEP-GEF African-Eurasian Flyways Project | The WOW project embraced a wide range of activities across Africa-Eurasia flyways, and included development of the Flyway Training Kit and a template for Training of Trainers (ToT) workshops, and the CSN Tool. The project also had demonstration projects, including at PNBA (Mauritania) and at Saloum/ Niumi (Senegal-The Gambia). | WI / BirdLife |
| 2010-2025 | Mediterranean | Support Programme to waterbird monitoring and wetland conservation in the Mediterranean basin (ongoing) | Aims to improve spatial coverage and quality of waterbird monitoring in the region by creating synergies, developing tools for exchange, strengthening national networks of observers, and completing wetland inventories. An international in-depth training session is organised each year, with usually one representative per country; (Morocco is the only African EAF country). | TdV / OFB / WI |
| 2011-2014 | Mauritania – Sierra Leone | Strengthening networks for the conservation of migratory birds and their habitats along the west coast of Africa (CMB project) | The CMB project focused primarily on building capacity of NGOs and government institutions in the region, whilst also aiming to improve conservation of migratory birds and key sites. The project also supported students' research in the region. | BirdLife / WI |
| 2013-2025 + | Flyways: African-Eurasian; Americas; Circumpolar; East Asian-Australasian | Arctic Migratory Birds Initiative (AMBI), a project of CAFF, the biodiversity Working Group of the Arctic Council | AMBI conducts activities to help conserve populations of priority Arctic-breeding migratory birds in decline. AMBI's African-Eurasian Flyway Workplan (2019-2023) included an objective to enhance capacity in Guinea-Bissau to strengthen the conservation management of the Bijagós Archipelago. | CAFF |
| 2015-2018 | Mauritania – Sierra Leone | Coastal Migratory Birds phase 2- strong capacity and targeted action for nature along the Atlantic coast of Africa (CMB2 project) | The project aimed to build regional capacity development for the monitoring and conservation of shorebirds and other threatened migratory waterbirds along the Atlantic coast of Africa, with a focus on Mauritania, Senegal and Guinea-Bissau. | BirdLife / WI |
| 2018-2020 | Mauritania, Senegal, Guinea-Bissau | Coalition for strengthened protection of coastal wetlands and waterbirds of West Africa (PAZHOC 1) | The main sites for the project were PNBA, Lower Senegal Delta, Saloum and Bijagós. The project aimed for priority sites to be well managed with thriving populations of waterbirds. Some research and monitoring elements were included. | PRCM / WI / BirdLife / & others |
| 2018-2020 | Mauritania, Senegal, The Gambia, Guinea-Bissau | Building capacity for the conservation and monitoring of coastal wetland birds in West Africa | This project focused on strengthening capacity in the region for waterbird conservation and the IWC. It included the support of local MSc students, improving the IWC networks, training fieldworkers and building capacity for waterbird studies and data management, use and analysis. Monitoring plans were also developed, and support provided to the IWC networks. | WI / BirdLife / PRCM / WSFI & others |
| 2012-2025 + | East Atlantic Flyway | Monitoring programme (ongoing) | The WSFI monitoring programme is planning, developing and supporting an extensive monitoring programme along the EAF. It includes significant capacity building components, at the regional, national and key site level. | WSFI / WI / BirdLife (Marc van Roomen) |
| 2012-2025 + | East Atlantic Flyway Africa | Capacity building & management programme (ongoing) | The WSFI capacity building & management programme focuses largely on building capacity and awareness along the EAF in Africa. It has supported a number of events that include significant elements of training in monitoring. | WSFI & others (Tim Dodman) |
| 2017-2025 | Mauritania, Senegal, Guinea-Bissau | PAZHOC (2 & 3): PAZHOC 2 (2020-2023); PAZHOC 3 (2023-2025) | Key sites in PAZHOC were the PNBA, Lower Senegal Delta, Saloum Delta and the Bijagós. The project aimed to support a functional network of sites on the flyway between Senegal and Guinea-Bissau. Some monitoring and training activities took place. | PRCM / BirdLife / WI |
| 2015-2025 + | BirdLife Partners, Morocco – South Africa | BirdLife EAFI (ongoing) | Support for waterbird monitoring, including strengthening capacity of BirdLife Partners along the EAF, including some monitoring. There is a BirdLife EAFI Small Grant scheme and support for site action. | BirdLife, VBN, RSPB |
| 2025 | East Atlantic Flyway Africa | Climate Resilience for Critical Sites for Migratory Birds and People along the East Atlantic Flyway | This major project was conceived initially in 2019 and launched in 2025. The project should include significant elements of research and monitoring, and building capacity for these. The main participating countries are Mauritania, Senegal and Guinea-Bissau, but extends to other countries and includes flyway-level activities. | CWSS / WSFI (WI, BirdLife, PRCM, BirdEyes) |

## 2.2 Training events / workshops that included monitoring or the IWC

Since the 1990s, efforts have been made to build capacity in monitoring waterbirds as illustrated in Annex 1, with a concise list of events provided in Table 2. These efforts ranged from regional workshops to site-based field training and workshops focused on managing data. Early events (1995 – 2002) focused largely on the set-up or launch of national monitoring schemes, especially in countries or sites that had not yet significantly engaged with the IWC (or AfWC). This was an important capacity building period for initiating and expanding monitoring programmes, although steps in building technical capacity were limited. Most events included in Table 2 did not focus specifically on waterbird monitoring, but included monitoring within the overall (training) programme. Some events listed did focus on monitoring, but were mostly introductory in nature, and did not deliver significant field expertise. A few events, however, had building capacity in waterbird monitoring as their main aim.

Waterbird monitoring activities *per se* are not listed, unless there was a very specific and dedicated capacity-building objective. Clearly, carrying out waterbird counts is key to building capacity, as the more anyone does something, the better they should get at it. Waterbird counts are discussed separately in section 2.c. An analysis of these events is presented in chapter 3.

**Table 2.** Concise record of training events / workshops that included monitoring or the IWC which have taken place along the East Atlantic Flyway in Africa between the 1990s and 2025

| Year | Country | Site(s) | Capacity building activities |
|---|---|---|---|
| 1990-2025 | Senegal | Djoudj | Establishment of long-term IWC counts |
| 1990s-2025 | Ghana | Coastal wetlands | Long-term monitoring of coastal lagoons |
| 1995-1997 | Guinea-Bissau | Bolama-Bijagós | 'Waterbirds in Guinea-Bissau' partnership |
| 1996 | Senegal | Djoudj | AfWC Review & Development Workshop |
| 1997 | Senegal | Sine-Saloum | Waterbird survey with goals to transfer methodology |
| 1998 | The Gambia | | AfWC exchange programme with Sierra Leone |
| 1998 | Togo | Lomé | Initial training workshop and set-up of network |
| 1998 | Cameroon | Coastal wetlands | A capacity building waterbird & wetland survey |
| 1998 | Gambia, SL | | Support RIZA wetland management course students |
| 1998 | Senegal | Dakar | Sub-regional training for West African AfWC NCs |
| 1999 | West Africa | | Wetlands & waterbirds inventory training workshops |
| 1999 | Senegal | Dakar | Set up the AfWC database at the WI office |
| 2000 | Sene-Gambia | | National / site-based training workshops |
| 2000 | Senegal | Saloum | Support SAPAD for training ecoguides |
| 2000 | Guinea-Bissau | | Training workshop and field surveys |
| 2000s | Mauritania | PNBA | Regular technical support for bird monitoring |
| 2001 | Liberia | Monrovia | First national AfWC training course, led by SCNL |
| 2001 | Cameroon | | National AfWC training course |
| 2001 | Guinea-Bissau | Bissau / Bubaque | Training course on waterbird identification & counting |
| 2002 | Mauritania | Diawling | Training course on wetlands and waterbird surveys |
| 2002 | Sierra Leone | Freetown | Course introducing wetland and waterbird monitoring |
| 2004 | Cameroon, DRC | Douala-Edea | Exchange and training programme |
| 2004 | Guinea-Bissau | Mansoa / Bissau | Field workshop on assessing bird densities in ricefields |
| 2004-2006 | West Africa | | Seabird field training workshops in four countries |
| 2005 | The Congo | Pointe Noire | Ecoregional workshop for the Gulf of Guinea |
| 2006-2007 | Guinea-Bissau | Bijagós, Jeta | Conservation and monitoring of IBAs in Guinea-Bissau |
| 2007 | Ghana | Accra, Sakumo | Regional IWC gap-filling workshop for West Africa |
| 2007 | Nigeria | Dagona | Training Workshop on Wetland Monitoring in Nigeria |
| 2007 | Cameroon | Coastal wetlands | Waterbird census of coastal Cameroon |
| 2009 | Cameroon | Limbe | West Africa regional ToT workshop |
| 2012 | Mauritania | Diawling | Regional workshop for EAF IWC NCs |
| 2013 | Guinea | Conakry | IWC and EAF monitoring |
| 2013 | Guinea-Bissau | Bubaque / Bijagós | Training course on migratory waterbird monitoring |
| 2013 | Sierra Leone | Kent | Training course, waterbird conservation & monitoring |
| 2013 | Senegal | Dakar | Regional workshop for 15 countries on database use |

| Year | Country | Site(s) | Capacity building activities |
|---|---|---|---|
| 2013 | Senegal | Djoudj | Regional Workshop on managing key sites |
| 2014 | Sierra Leone | Tissana | Community waterbird training workshop |
| 2014 | Angola | Luanda | ToT workshop on flyway approach to conservation |
| 2014 | Guinea-Bissau | Jeta | Support for seabird monitoring and surveillance |
| 2015, 2016 | Angola | Ilhéu dos Pássaros | Construction of a bird hide for monitoring & research |
| 2015-2025 | The Gambia | Coastal wetlands | Long-term (ongoing) support to the IWC |
| 2016 | Namibia | Walvis Bay | Angola-Namibia Exchange Programme |
| 2016 | Gabon | Coastal wetlands | Intensive field training, with donation of binoculars |
| 2016 | Senegal | Dakar | EAF workshop for NCs in monitoring waterbirds |
| 2016 | Senegal | Dakar | Training on IBA monitoring and data management |
| 2016 | Senegal | Dakar | PAOC: Major continent-spanning conference |
| 2016 | Sierra Leone | Tissana | Training Tour Guides for bird tourism promotion |
| 2017 | S Tomé Príncipe | São Tomé coastline | IWC count, with training in bird census techniques |
| 2017 | Morocco | Dakhla Bay, Khnifiss | Building capacities in waterbird monitoring |
| 2017 | Guinea-Bissau | Bijagós (Bubaque) | Training on bird monitoring and data use |
| 2018 | Senegal | Saloum | Training on colonial breeding birds and use of drone |
| 2018 | Senegal | Dakar | Regional training workshop on using the IWC database |
| 2018 | Senegal | Saloum Delta | Regional workshop on data collection using ObsMap |
| 2018-2020 | Guinea-Bissau | Bijagós Archipelago | Waders of the Bijagós project |
| 2018 | Guinea | Conakry | Training in sample counts and field identification |
| 2018-2020 | Senegal | River deltas | Integrated management of the main deltas of Senegal |
| 2019 | Guinea-Bissau | Bissau | Workshop with IBAP and GPC to discuss monitoring. |
| 2019 | Angola | Ilhéu dos Pássaros | Field training for volunteers in waterbird counts |
| 2019 | Guinea | Conakry | Workshop on bird monitoring and count techniques |
| 2019 | Sierra Leone | Tasso | Workshop on bird identification & monitoring |
| 2019 | Senegal | ROK, Casamance | Training in data collection tools, including ObsMap app |
| 2019 | Senegal | Technopôle | Workshop on the conservation & ornithology |
| 2019 | Benin | Cotonou / Nokoué | ToT workshop on flyway approach to conservation |
| 2019 | SN, RIM, G-B | | Training on disturbance monitoring protocol, seabirds |
| 2019 | Morocco | Laayoun, Boujdour | Waterbird identification and monitoring |
| 2019 | Nigeria | Bakassi, Cross River | Train local groups, mangrove & bird conservation |
| 2019 | Guinea-Bissau | Bubaque, Bijagós | Regional training workshop in ecotourism |
| 2021 | Sierra Leone | Tasso | Nature-based and Bird Training for Tour Guides |
| 2021 | Senegal | Beteny, Saloum | Regional workshop on monitoring breeding birds |
| 2021 | Mauritania | PNBA | Training in waterbird identification and counting |
| 2022 | | | Workshop for Mauritania, Senegal, Guinea-Bissau NCs |
| 2022 | Cote d'Ivoire | Eotiles NP | Training workshop on bird identification & monitoring |
| 2022 | Morocco | Guelmim, Dakhla | Building capacities in waterbird monitoring |
| 2022 | Guinea-Bissau | | Workshop to discuss monitoring set-up |
| 2023 | Senegal | | Workshop on drone counts of breeding tern colonies |
| 2023 | Togo | Lomé | National workshop and counts; transboundary support |
| 2023 | Morocco | Khnifiss, Boujdour | Building capacities in waterbird monitoring |
| 2023 | Gabon | Coastal wetlands | Field training for members of coastal IWC group |
| 2023 | Sierra Leone | Yawri Bay, Tissana | Training Workshop for young people/ youth |
| 2023 | Angola | Tômbwa | Basic training in monitoring birds |
| 2024 | Benin | Coastal wetlands | Monitoring breeding bird colonies, with drone use |
| 2024 | Mauritania | Cap Blanc | Training in wetlands conservation & waterbird counts |
| 2024 | Senegal | Saly | Workshop on migratory birds & IBA/KBA monitoring |
| 2024 | Senegal | Different regions | Training in bird identification & monitoring |
| 2025 | Cameroon | | Field training in count unit boundaries & protocols |
| 2025 | Senegal | Dakar | Training workshop on KBAs for stakeholders |

Workshops have played an important role in bringing people together, enabling discussion and sharing results and ideas, and have taken place at regional, national and site levels. Several more general wetland, conservation or ornithological events promoted improved monitoring or included monitoring in the agenda, often within field trips. The few Training of Trainers (ToT) workshops have helped to build capacity in training itself, and further ToT events with dedicated follow-up would be useful. The Pan-African Ornithological Congress (PAOC) has enabled monitoring results to be presented to a wider audience, and brought people together for focused symposia and round table discussions. Such events can play an important role in strengthening networks, and serve as a good vehicle for students, building their confidence and capacity.

The long list of capacity building events in Annex 1 and Table 2 seems impressive, and in many ways it is. However, the following should be taken into account:

a. Very few of these events focused solely on waterbird monitoring; rather, monitoring was a component, sometimes quite a small one, of the event, which did not always involve field training.
b. Most events were invariably rather short and without follow-up.
c. There have been situations where the same participants, such as site managers or senior organisation representatives, have taken part in a number of similar training events, especially regional or national ones. Further, some participants were not always directly involved in monitoring.
d. There is often a high turnover in personnel involved in waterbird monitoring, especially within protected area agencies.
e. There are 21 African countries along the coastal EAF, and given this extensive area and high turnover, the need for building capacity, like monitoring itself, will always remain.
f. Training events have largely revolved around the January counts or sometimes breeding colony censuses. This is certainly worthwhile. However, there is in many cases no training and little field work by trained agents in between these periods.

## 2.3 January IWC Counts of coastal wetlands

Conducting January waterbird counts for the IWC is a key component of monitoring waterbirds along the East Atlantic Flyway, and has been underway on a regular basis in several countries along the flyway since the 1990s. All January counts offer important opportunities for building capacity of local teams, usually through learning by doing. Opportunities increase when there are mechanisms in place to help new observers to learn from more experienced ones, and when there are planning and feedback sessions before, during and after the counts. However, as monitoring campaigns are often time-sensitive and sometimes conducted under difficult conditions, they do not always afford such training opportunities.

Since 2014, there have been four 'total' waterbird counts along the flyway, coordinated by WSFI, Wetlands International and BirdLife International, when extra efforts were made in an attempt to cover as wide an area as possible along the flyway and to ensure that the key sites were well covered. All African countries of the flyway were invited to submit proposals for their counts in 2014, 2017, 2020 and 2023, including descriptions of their count itineraries and needs. This process resulted in contracts with national partners for conducting the waterbird counts. In some cases local participants gained experience in planning the census and in initial data assessments, for instance through meetings before and after the events. Several censuses involved mixed teams of local participants and experienced international waterbird counters, who helped to build capacity of less experienced local teams (Table 3). These events have not focused on capacity building, but clearly local participants have gained experience in taking part, and improved their ability to identify and count waterbirds.

**Table 3.** 'Total' January Counts of coastal wetlands along the East Atlantic Flyway where international waterbird counters helped locally with the surveys; (a ✔ represents the presence of one or more international waterbird counters)

| Country | Years | | | | Notes |
|---|---|---|---|---|---|
| | 2014 | 2017 | 2020 | 2023 | |
| All countries | ✔ | ✔ | ✔ | ✔ | Support of total counts, including workshops before and after the counts. Teams of international and local counters working together.<br>Intensive field practice in identification, assessing numbers and planning monitoring.<br>Training opportunities were limited for new observers due to the need to focus on the counts, but the exchange was very useful for more experienced local counters in species identification, counting and monitoring planning. |
| The Gambia | ✔ | ✔ | ✔ | ✔ | |
| Guinea-Bissau | ✔ | ✔ | ✔ | ✔ | |
| Guinea | ✔ | ✔ | ✔ | ✔ | |
| Sierra Leone | ✔ | ✔ | ✔ | ✔ | |
| Côte d'Ivoire | | ✔ | | | |
| Benin | | ✔ | | | |
| Cameroon | | ✔ | | ✔ | |
| Angola | | ✔ | ✔ | ✔ | |

All January IWC counts invariably present opportunities for building capacity, but the 'total counts' planned every three years, present improved opportunities, with planning support for all countries in developing monitoring proposals and providing feedback on results. In countries where international counters / experts join national or local teams to undertake these surveys, there are additional capacity benefits, given the interactions during the counts about bird species, numbers and counting techniques. Training opportunities can be limited during the counts themselves, especially in complex sites, where counting is time sensitive and difficult even for those with significant experience. It is hard for an experienced counter to stop counting, which essentially is their primary task, and explain to a new counter with limited experience, how to undertake the work. However, there are significant opportunities for building capacity of local partners, and the transfer of knowledge works best when more experienced local counters work alongside international experts and benefit from 'learning by doing', especially through sharing tasks with experienced counters.

Meetings before and after counts and daily planning / evaluation meetings, which happen in several sites, are essential. The planning meetings are generally used for planning purposes, such as organising teams, and in large sites setting the itinerary in terms of tides and times and forming the counting units. However, at some sites, refresher training or reminders about bird identification and counting techniques are provided.

## 2.4 Building capacity through integrated monitoring and research programmes

Integrated monitoring and research focused on waterbirds and different attributes of wetlands have taken place along the flyway through site-based research programmes, such as investigating the ecological links between waders and benthos, and regional or flyway-level approaches, such as integrated monitoring of waterbirds through colour-ringing. Building capacity in or during integrated monitoring and research is under-recorded in Table 2, as examples of this are naturally not based around specific events or activities, but tend to occur over several years. Some research may form part of a PhD or MSc, usually through collaborations between protected area administrations and universities or research institutes, often in Europe. However, university MSc, PhD or post-doctoral research or longer-term research programmes play a vital role in building capacity for monitoring waterbirds in the region.

A good example of a research programme that has contributed significantly to building ornithological capacity is that led by NIOZ in the PNBA. NIOZ has organised a yearly expedition to the PNBA since 1985, working in close collaboration with the park administration, fieldworkers and local researchers.

Universities in West Africa are increasingly becoming involved in different aspects of research at coastal wetlands. The University of Cheikh Anta Diop (UCAD), Dakar, Senegal offers professional studies in biological sciences, including, for example, an MSc in Science and Technology specialising in animal biology, ecology and ecosystem management. The University of Gaston Berger (UGB), Saint Louis, Senegal, recently launched an MSc in Ornithology, Conservation and Development in collaboration with a range of partners. This new initiative complements the MSc in Conservation Biology at APLORI, Jos, Nigeria, which has produced a good number of graduates focused on ornithological research.

In countries with strong universities and where it is possible to conduct ornithological research in the field, there are good prospects for autonomy in managing successful bird monitoring programmes. The CBCR of the University of Ghana is a regional leader in waterbird and wetlands research, whilst the Fitzpatrick Institute of African Ornithology in South Africa has pioneered shorebird research. Several Cabo Verdean ornithologists lead fieldwork and research in their country, especially in seabirds. The University of Cabo Verde (Uni-CV) and the Atlantic Technical University through the institute ISECMAR both offer degrees in biological sciences, and have strong links with universities in other countries, including Portugal.

Whilst research programmes have research objectives as their primary goal rather than capacity building, they no doubt significantly contribute to building capacity in many cases, not just of the researchers but of fieldworkers involved in or supporting the research at different levels, such as field assistants and personnel providing logistical support. Research also requires the methodical collection and management of data, and deeper thought and analysis. Building capacity in these processes is key for improving regional capacity for waterbird monitoring, to enable results from the field to be well managed, well stored and well used.

Some capacity building events in Table 2 containing elements of research include work conducted in colonial bird colonies, where participants learned new skills, such as analysing the diet of terns and gulls. Acquiring such field skills not only helps to broaden a fieldworker's abilities, but also contributes to building interest and enthusiasm. A good example of integrated waterbird monitoring that requires dedicated fieldworkers is the reading of colour rings, plus learning about how such readings contribute to understanding bird migration and site use.

## 2.5 Optics, equipment, field guides and manuals

### Optics and field equipment

Binoculars, and to a lesser extent telescopes, are essential for conducting successful waterbird counts. Yet, their availability, quality or condition are not guaranteed at many sites. Binoculars have been provided to participants by Wetlands International, BirdLife International (including a second-hand scheme supported by VBN), WSFI, AEWA and other organisations, often linked to some of the training events or workshops illustrated in Table 2. Other organisations have also provided optics, including the Wildfowl and Wetlands Trust (WWT), sometimes linked to education and awareness programmes or wetland centres. Binoculars significantly aid in the identification and counting of waterbirds, and their provision no doubt contributes to building capacity. Indeed, it is hard to expect anyone, trained or untrained, to participate successfully in waterbird monitoring unless they have reliable access to binoculars. For some sites, especially where there are extensive mudflats, telescopes are indispensable.

Although a reasonable number of binoculars and telescopes have been provided over the years, there are still issues of availability and quality, including the following:

- **Kept under lock and key:** Optics are kept securely, e.g. by a protected area manager. Whilst controlling scarce and valuable equipment is important, very strict control can result in them being unavailable for most field workers and reserved only for senior staff or visiting dignitaries. Sometimes access requires heavy bureaucratic procedures.
- **Lack of care:** Optics are sensitive to the environment, especially in coastal wetlands with a marine influence and in areas with much dust. In some cases, equipment is not cared for properly and deteriorates. 'Foggy' optics are hard to use.
- **Disappearance:** Optics may disappear, especially if assigned to protected areas staff who are then transferred to another park and take them with them, or if staff leave an organisation and retain the optics.

There is no fixed mechanism to ensure that optics remain available, as conditions and culture vary between countries and sites. BirdLife International opts currently to provide optics to trusted persons who show genuine enthusiasm for ornithological fieldwork, and who are most likely to regularly use, value and care for their optics.

Other tools provided through projects and/or partners include cameras, GPS, tripods, laptops and drones. Provision of drones can entail security issues.

## Field guides and manuals

Resources such as field guides, manuals and training kits are valuable resources, and play an important role in building capacity for monitoring in Africa. Field guides, either as printed books or in digital formats, are particularly important, especially when they are owned or freely available to those carrying out waterbird monitoring. They can significantly help to build local expertise in bird identification. There are a few tools available that also help in strengthening ability to count birds, such as *Identifying and counting waterbirds in Africa: A Toolkit for Trainers*, and others that can provide a deeper understanding about flyways, migratory movements and pressures to waterbirds and wetlands, such as the *WOW Flyway Training Kit*. A couple of resources also play an important role in the training of trainers through provision of exercises and training techniques.

**Table 4.** A selection of field guides and manuals that support waterbird monitoring, especially those relevant along the East Atlantic Flyway in Africa

| Year | Capacity building tool | Description | Lead(s) |
|---|---|---|---|
| 1989 | Shorebird Studies Manual (Howes & Bakewell 1989) | This, the first manual in field methodology of shorebird surveys, contains practical and clear illustrations, and guides the reader through different research and survey techniques, including the choice and use of field equipment, techniques of counting waterbirds, bird ringing and identification of bird families. | Asian Wetland Bureau |
| 1992 | Manual for Aeroplane and Ship Surveys of Waterfowl & Seabirds (Komdeur *et al.* 1992) | This practical manual focused on carrying out counts of mainly coastal waterbirds, especially for European waters, where large 'rafts' of sea ducks congregate at certain times of the year. | IWRB |
| 1997 | A Preliminary Waterbird Monitoring Strategy for Africa (Dodman 1997) | This introduction to the IWC, born from the first regional AfWC workshop in West Africa, provides useful information on census goals, principles, reporting and application of results. It also highlights training needs, cooperation and engagement. | WI |
| 2002 | Wetland & Waterbird Surveys for Africa, Volume 1: Information Guide. Volume 2: Field Manual | This manual aimed to develop capacity of the AfWC network, presenting practical information on counting birds and field techniques with a large component on wetland monitoring. The manual was split into a field manual and an information guide, to keep the field manual small enough to carry into the field. | WI (not finalised) |
| 2003 | Échassiers, canards, limicoles et laridés de l'ouest africain (Girard 1998) | This field guide in French covers 129 waterbird species of West Africa, with illustrations, descriptions and a map for each species. It includes different counting techniques, guidance on reporting ringing recoveries and a section on wetlands conservation. | OFB |
| 2004 | Manual for monitoring seabird colonies in West Africa (Veen *et al.* 2006) | This manual serves as a reference for setting up and implementing colonial seabird research and monitoring programmes, with practical information on field work, planning and data analysis. It is available in French and English, and was a precursor to the seabird manual published in 2015. | WI |
| 2005 | Waterbird monitoring in the Bijagós Archipelago, Guinea-Bissau (Dodman & Sá 2005) | This bilingual publication (English and Portuguese) presents an overview of the inter-tidal area of the Bijagós and its waterbirds, with an analysis of past data. It also provides recommendations for future monitoring of the Bijagós, and includes an extensive training manual in waterbird census and wetland inventory. | WI / GPC / ODZH |
| 2010 | Guidance on waterbird monitoring methodology: Field Protocol for waterbird counting (Wetlands International 2010) | This 15-page guide on implementing waterbird monitoring, especially the IWC, provides a practical introduction to monitoring, including its rationale. It covers how to count and the equipment needed, when to count and record keeping. It is a useful reference for the IWC, especially for NCs. | WI |
| 2010 | WOW Flyway Training Kit: The Flyway approach to the conservation and wise use of waterbirds and wetlands: a training kit (Dodman & Boere 2010) | This Training Kit aims to strengthen networks in understanding flyway conservation. It contains three technical modules and a template for flyway workshop programmes, supported by PowerPoint presentations and workshop exercises and case studies. The kit was published in folder format and is available online. It is available in English, French, Arabic and Russian, and partly in Portuguese. | WI / BirdLife / AEWA |
| 2013, 2020 | Arabic language identification guide for migratory waterbirds in Northern Africa (Azafzaf *et al.* 2013) | This pocket field guide covers 200 waterbird species recorded from North Sudan to Mauritania, each presented with its vernacular Arabic names, drawings and texts of identification, a map of distribution and information on its status. | OFB / AAO / TdV / BirdLife |

| Year | Capacity building tool | Description | Lead(s) |
|---|---|---|---|
| 2013 | Integrated monitoring of coastal waterbird populations along the East Atlantic Flyway (van Roomen *et al.* 2013) | This report provides a framework and programme outline for integrated monitoring of waterbird populations along the EAF. It describes the current state of monitoring along the EAF and provides a framework and working programme. It introduces the needs for monitoring and guidance for its implementation. | WSFI / BirdLife / WI |
| 2014 | Waterbird and site monitoring along the Atlantic coast of Africa: strategy and manual (van Roomen *et al.* 2014) | This monitoring strategy aims to support improved monitoring of waterbirds and their sites. It covers non-breeding and breeding birds and environmental monitoring. The manual informs how to make a site inventory and organise an observer network and field work, what to provide to observers, and how to compile and use data. It indicates how to count waterbirds, which equipment to use and how to submit data. Guidelines are also given on how to score environmental conditions and threats. | WSFI / BirdLife / WI |
| 2015 | Identifying and counting waterbirds in Africa: A Toolkit for Trainers (Hecker 2015) | This CD (also available online) provides an educational framework and toolkit for trainers to conduct training courses in waterbird identification and counting in Africa. It consists of 8 modules, and is available in French and English, with two versions, one for North Africa and one for sub-Saharan Africa. | OFB / TdV / WI / AEWA |
| 2015 | Manual for monitoring breeding colonies of terns and gulls along the West African coast (Veen & Mullié 2015) | This manual aims to assist fieldworkers involved in monitoring seabird colonies, providing guidelines on how to correctly obtain information in a standardised manner, and how to behave in a colony and maintain equipment. The manual is available in English and French as a CD, and in Arabic and Portuguese online. | FIBA / BirdLife |
| 2010-2025 | Critical Site Network Tool (CSN$^{2.0}$): http://criticalsites.wetlands.org/en | The CSN Tool is an online resource that presents information on 312 species of waterbirds and the sites on which they depend. Its first edition was developed under the WOW project, with the second edition developed under the framework of the Climate Resilient Site Network in the African-Eurasian Flyway project. It aims to strengthen AEWA and Ramsar implementation. A manual was produced in 2010, replaced by later online guidance. | WI / BirdLife |
| 2021 | African East Atlantic Flyway Guide – Photographic Field Guide to Waterbirds and Seabirds of Africa's Western Coastline (Barlow & Dodman 2021) | This trilingual field guide aims to assist wildlife personnel, students and enthusiasts to learn about and identify waterbirds and seabirds of the coastal EAF. The book includes descriptions, photos and flyway maps of all waterbirds of the flyway included in the IWC. The guide also introduces EAF coastal wetland and marine habitats and information about monitoring, research and bird migration. All text is in English, French and Portuguese. | WSFI / BirdLife |
| 2023 | Seabird conservation handbook for West Africa (for Mauritania, Senegal, The Gambia, Guinea-Bissau, Guinea, Sierra Leone & Cabo Verde); (Dodman *et al.* 2023) | This handbook, available online in English, presents the biology and ecological characteristics of seabirds, introduces seabirds that occur in West Africa and their main threats t and causes of their decline. It also introduces strategies and conservation tools, and provides a practical introduction to monitoring seabird colonies and other areas necessary for seabird conservation. | BirdLife |
| 2025 | IWC MOOC for North and Sahelian Africa: https://www.mooc-conservation.org/courses/course-v1:IUCN-Papaco+-MOOC-OiseauxOFB+FR-1/about | This online MOOC should be available in French in late 2025. It will include training presentations similar to the CD 'Identifying and counting waterbirds in Africa: a Toolkit for Trainers'. It will also include many images and hours of videos of waterbirds, as well as interviews and other information. It will be available as either an open or a registered course and will be free. There will be opportunities for interaction during the courses. It should be translated in future into English and Arabic. | OFB, FAO, others |

*Note, this list does not include commercially available publications, such as regional or national field guides.*

Some basic tools are essential for monitoring waterbirds, especially binoculars. Yet even these are in short supply and often have to be shared. Field guides are also essential. Recent guides in different languages have an important role to play. There is a growing need for online or digital materials, especially ones that can be used on a phone. Other tools such as the WOW Training Kit and the CD 'Identifying and counting waterbirds in Africa: A Toolkit for Trainers' are excellent resources, especially for training workshops.

Tim Dodman

**A student using a field guide in Guinea-Bissau**

# 3. Analysis of activities carried out along the East Atlantic Flyway in Africa that included capacity building for monitoring

In order to illustrate a more visual picture of past capacity building efforts for monitoring, an analysis of the events presented in Annex 1 and Table 2 (section 2.b) is provided below. The analysis gauges the proportion of events that were focused on different aspects of capacity building for five year blocks between 1990-1995 and 2021-2024/25. A summary of the events analysed are listed below:

- the IWC, including planning monitoring / waterbird counts and the set-up of monitoring programmes
- data management and analysis
- conducting monthly waterbird counts
- counting waterbirds and the identification of waterbirds
- monitoring breeding bird colonies
- monitoring sites and threats to sites
- Training of Trainers events

A further analysis was made to illustrate the geographical range of capacity building events.

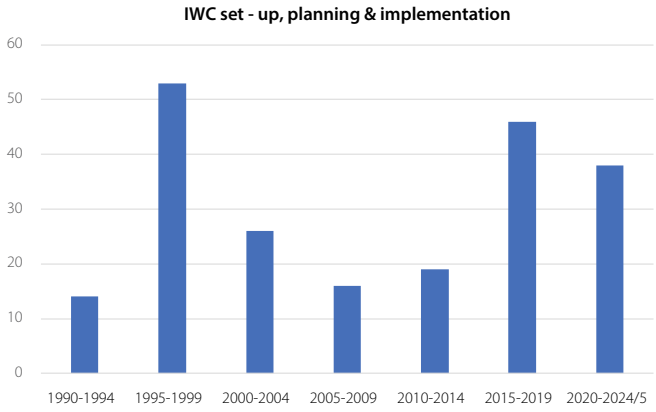


**Figure 1.** Capacity building events related to the International Waterbird Census (IWC) and planning for the IWC between 1990-1995 and 2020-2024/5

## 3.1 Capacity building events related to the IWC

There were only a few capacity building events related to waterbird monitoring in the early 1990s, but these increased significantly in the late 1990s due to Wetlands International's regional project *Building the Capacity in West Africa of a Regional Network for Wetland and Waterbird Management*, 1998-2002. A number of workshops and other events aiming to start up IWC networks in a range of countries, including The Gambia, Guinea, Sierra Leone, Côte d'Ivoire and the Congo, supported by this project, contributed to a peak in 1999, before the project concluded in 2002. Capacity building focused on waterbird monitoring didn't pick up again until around 2013, when WSFI, BirdLife International and Wetlands International worked together to support various capacity building events linked directly to the IWC, peaking in 2019. Events declined subsequently, partly due to Covid-19, whilst the MAVA Foundation, which funded projects that included IWC support also came to an end. Annual waterbird count planning meetings have taken place over much of the period at some key sites in Senegal, Mauritania and Ghana.

With some new projects starting up and other initiatives ongoing or under development, there is a reasonable expectation that IWC capacity building events will pick up again in the near future.

## 3.2 Capacity building events related to waterbird data / database management

Capacity building for data management showed a similar pattern to that for IWC events, with a peak under the Wetlands International project of the late 1990s, which included the transfer of the AfWC database to the organisation's office in Dakar, Senegal, and another peak around 2018/19. However, with a peak of only nine events recorded in a five-year period (2015-2019) over a range of 21 countries, building support for data management has remained consistently low.

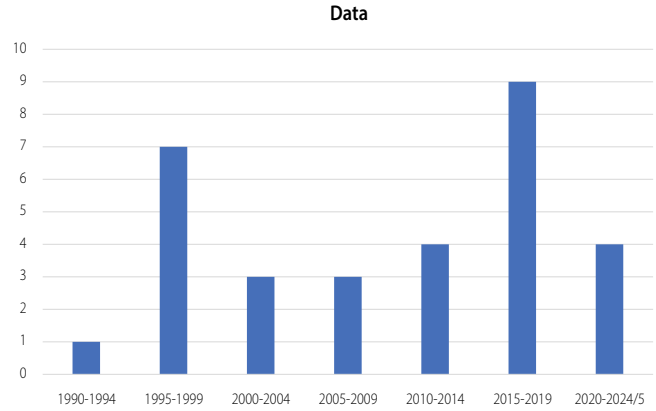


**Figure 2.** Capacity building events related to IWC data and database management between 1990-1995 and 2020-2024/5

## 3.3 Capacity building through monthly waterbird counts

The peak period for building capacity through regular / monthly field monitoring was in the 2000s, due largely to year-round field surveys at the PNBA, Mauritania. The presence of long-term technical support no doubt made a big difference in building capacity at PNBA, when a few older field personnel gained significant experience and confidence. This type of capacity building for monitoring appears to have tailed off, however, although local personnel are involved in some important field research. Regular in-the-field 'learning by doing' may be one of the most effective means to transfer knowledge and capacity, which cannot compare with one-off short workshops. It can be relatively low-cost, providing there is expertise available at the site level, and support for and interest in conducting monthly or regular field surveys.

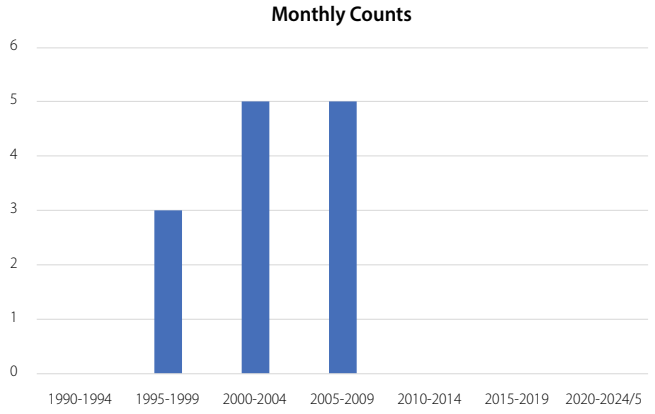


**Figure 3.** Capacity building related to monthly or regular waterbird counts between 1990-1995 and 2020-2024/5

## 3.4 Capacity building events focused on waterbird identification and counting

Waterbird identification and counting are key steps in building capacity for monitoring waterbirds, as without these skills counts conducted are invariably not reliable. Much of the training is linked to the January counts, taking place either before or afterwards. Training during the counts themselves tends to be limited. It is likely that more training takes place across the region on a small scale and through learning by doing, but it is not easy to compile or assess these events. A concern is that regular or monthly training does not take place widely, and it is likely that some personnel who take part in events around the January counts do not actively participate in bird monitoring at other times of the year.

There appear to have been very few dedicated training workshops focused on identification and counting techniques that have been actively followed up on subsequently. Most events have been one-off. There is also a strong link here to the availability of optics and field guides (section 2.f). If trained personnel do not have access to binoculars especially, they are unlikely to continue to build their own skills.

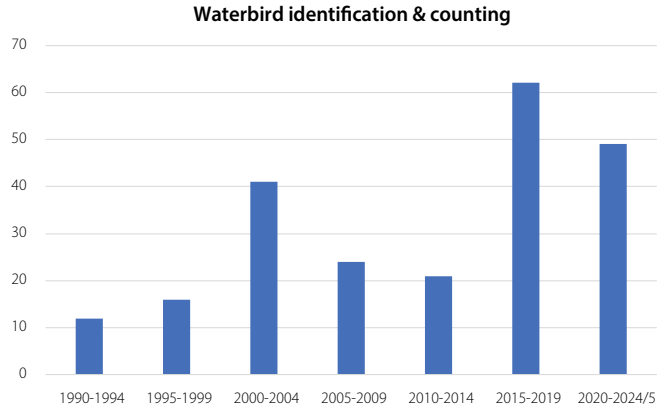


**Figure 4.** Capacity building related to waterbird identification and counting between 1990-1995 and 2020-2024/5. Results from separate figures for identification and for counting have been combined.

## 3.5 Building capacity in monitoring of waterbird breeding colonies

Continental West Africa has a number of important waterbird and seabird colonies, especially of gulls, terns, cormorants and White Pelican *Pelecanus onocrotalus* (which are included in definitions of both seabirds and waterbirds). However, the most important country in the region for breeding colonies of other seabirds, such as petrels, storm-petrels, shearwaters, boobies and tropicbirds, is Cabo Verde. Significant research, monitoring and capacity building have taken place in Cabo Verde in these colonies especially since the 2010s, and most monitoring is now led by competent, qualified Cabo Verdean teams. This has been achieved through research and monitoring programmes lasting several years jointly led by universities in Europe and Cabo Verde with financial support, especially through the MAVA Foundation, and carried out by NGOs with enthusiastic teams of well-trained staff. There could be useful lessons to learn from Cabo Verde.

There have also been capacity building efforts in monitoring gull and tern colonies of West Africa, supported by Wetlands International in the 2000s and by BirdLife International in the 2010s. There has been some recent training in the use of drones to monitor gull

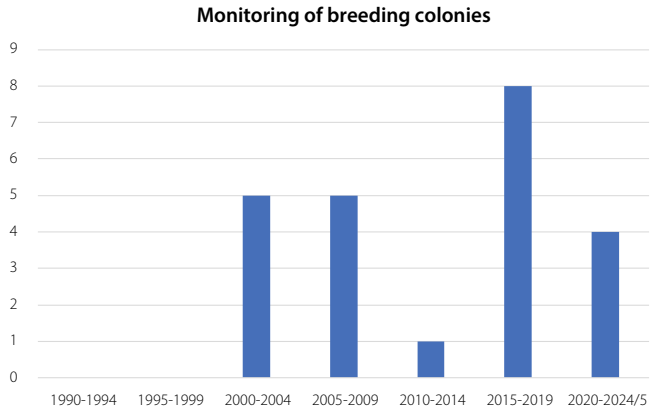


**Figure 5.** Capacity building related to monitoring breeding waterbird colonies between 1990-1995 and 2020-2024/5

and tern colonies in West Africa. Drone use is also being piloted in the coastal zone of Benin to monitor colonies of herons, egrets and Openbill Stork *Anastomus lamelligerus*. The PNBA has a regular monitoring programme of its colonial breeding birds, especially its endemic subspecies of Grey Heron *Ardea cinerea monicae* and Eurasian Spoonbill *Platalea leucorodia balsaci*, although training in monitoring colonies does not seem to be taking place.

## 3.6 Capacity building events related to monitoring sites and pressures

Basic monitoring of sites and pressures has been a feature of the IWC at least since the 1990s, and AfWC / IWC teams submitted site forms, where records of site status were recorded, including disturbance and threats. However, these forms were had to analyse as information was largely qualitative. Important Bird and Biodiversity Area (IBA) monitoring forms have also been used to some extent. During the flyway monitoring programmes that started in 2013, more effort has been made in developing more standardised monitoring of sites, especially their pressures. However, specific efforts in building capacity for site monitoring have been limited, and need to be prioritised to achieve greater accuracy and understanding of site pressures in the future.

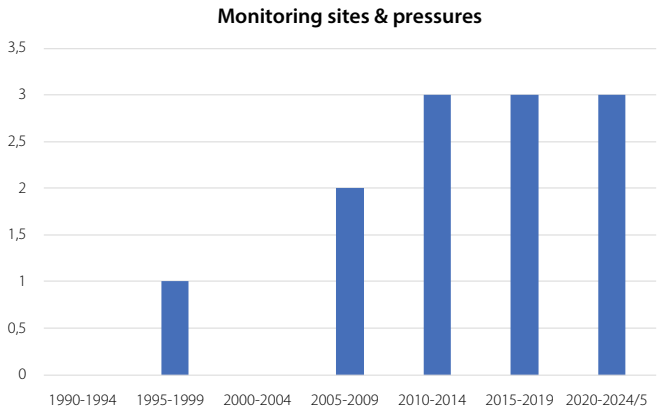


**Figure 6.** Capacity building related to monitoring sites and pressures between 1990-1995 and 2020-2024/5

## 3.7 Training of Trainers events

In various disciplines, it is common to label a workshop or course as a Training of Trainers (ToT) event. For this analysis, only those events that focused on building skills in the delivery of training and introducing training techniques have been included. These events largely included the use of two tools, the Flyway Training Kit and the toolkit for identifying and counting waterbirds. It is important to follow up ToT events with support for those who participated in the training, to give them the opportunity to use their skills in delivery monitoring training, although this can present a challenge, especially in relation to funding.

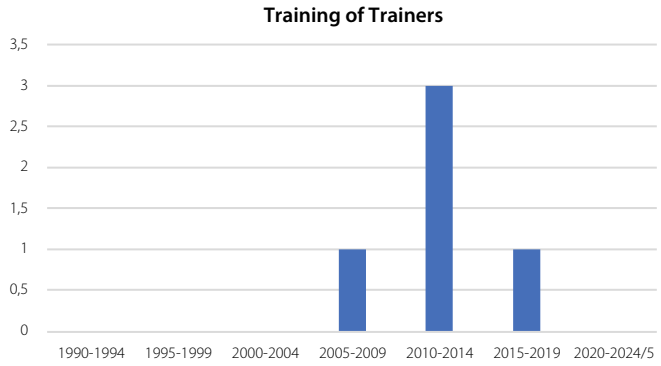


**Figure 7.** Training of Trainers events between 1990-1995 and 2020-2024/5

## 3.8 Capacity building events in different countries

Figure 8 illustrates the range of capacity building events that have taken place in different countries. It does not distinguish between regional and national or site-based events. Although Senegal was the location for a high proportion of events, a reasonable number of these were regional or sub-regional events, especially given the presence in Senegal of regional offices of several international organisations. Senegal and Ghana both scored highly due to some measures of capacity building regularly taking place during January counts. In Senegal's case, this refers to the long-term waterbird census at Parc National des Oiseaux du Djoudj, whilst in Ghana there have been measures to build capacity during their long-term waterbird counts of coastal wetlands. Mauritania and Guinea-Bissau have both benefited from some capacity building for monitoring largely through partnership programmes at PNBA and in the Bijagós. Senegal, Mauritania and Guinea-Bissau also register in relation to support for monitoring colonies of gulls and terns. The Gambia also scores quite high, due to the partnership support under WSFI, in which a small team from Germany has supported the January counts most years between 2015 and 2025.

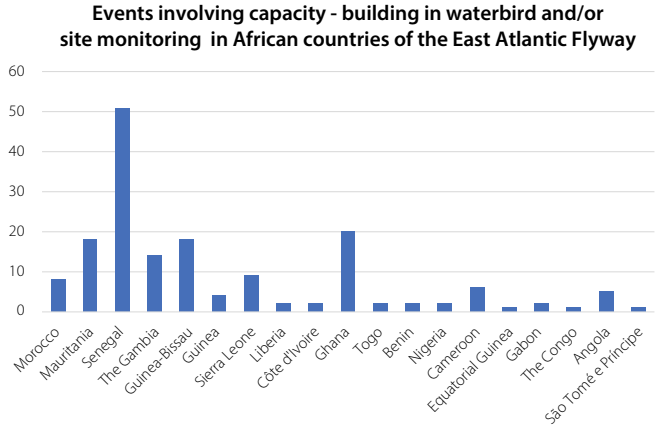


**Figure 8.** Capacity building events in different countries between 1990-1995 and 2020-2024/5

Undoubtedly there have been other events across the region that have not been recorded here.

# 4. Assessments of capacity and needs at three key sites

## 4.1 Parc National du Banc d'Arguin, Mauritania

### 4.1.1 Parc National du Banc d'Arguin

The PNBA is one of the most important sites along the East Atlantic Flyway for migratory waders and breeding waterbirds, with one of the largest concentrations of non-breeding shorebirds in the world. It is a designated as a Marine Protected Area (MPA), Ramsar Site and UNESCO World Heritage Site largely by virtue of its importance for migratory animals. The site has about 500 $km^2$ of intertidal mudflats and a mosaic of islands. Waterbirds at PNBA are increasingly under anthropogenic pressure, and numbers of many species show sharp changes, with most migratory waterbirds that breed in the Western Palearctic in steep decline (El-Hacen & Kide 2022).

### 4.1.2 Waterbird counts in the Banc d'Arguin

The first waterbird counts of the PNBA were in 1973, 1979 and 1980, with further counts organised between 1990 and 1994 and in 1997, 2000, 2001 and 2006 until the three-yearly total counts of the flyway began in 2014 (Oudman *et al.* 2017). Not all counts covered the whole area, and the first complete census was in 1980, when over 2.3 million waterbirds were estimated to be present. The extensive size of the PNBA and its shifting bird distributions between tides combined with significant logistical and organisational challenges render counting waterbirds at the PNBA a major undertaking that requires thorough planning and good teamwork.

A workshop in 2017 evaluated the results and methodology of all northern winter counts of waterbirds at the Banc d'Arguin to gain more knowledge on the (causes of) temporal dynamics in the shorebird numbers at Banc d'Arguin, to discuss the optimal design for future shorebird monitoring, and to improve collaboration between all involved parties (Oudman *et al.* 2017).

### 4.1.3 Workshop to review monitoring capacity at PNBA, December 2024

A workshop was held in December 2024 to review the status of capacity at the Banc d'Arguin for monitoring waterbirds by assessing the strengths and weaknesses, considering threats and looking into issues relating to data collection and local management as well as communication. Participants were PNBA field, database, communications and management staff plus representatives of Nature Mauritanie and student volunteers. The workshop considered capacity both for January waterbird counts and for monitoring breeding bird colonies. Results of the workshop and related discussions and information are provided below.

### 4.1.4 SWOT analysis for monitoring waterbirds in the PNBA

Results from the SWOT analysis for monitoring waterbirds in the PNBA are illustrated in Figure 9.

**Strengths:** The PNBA has experienced field staff and strong partnerships for monitoring waterbirds, as well as long-term associations with research institutes. The park has a centre at Iwik, which serves as a base for monitoring teams, with provisions for accommodation, food and meetings, and has logistical and field equipment, including vehicles, boats and optics. Importantly, PNBA has the capacity to prefinance some activities, and long-term support arrangements, especially through BaCoMaB.

**Weaknesses:** The personnel experienced in ornithology and monitoring are rather few, and there is a lack of experience in young staff and other IWC participants. Few staff, for instance, are able to confidently identify and count waders, for which the PNBA is internationally important, and which are key targets for monitoring. Having strong knowledge of the complexity of the site, especially in relation to tidal movements and navigation is essential, and this capacity is also limited to just a few staff.

**Opportunities:** The park is a well-established institution, with strong international and national partners and, compared to many sites, reasonable resources for carrying out monitoring. Thus, it should be achievable to address current weaknesses and maximise strengths. Opportunities identified included several aimed at building capacity of field teams through on-site and academic training and exchange, especially for younger personnel. Safety was highlighted as a key issue for fieldwork, including communications and first aid.

Whilst the PNBA has a reasonable supply of logistical and optical equipment, it was widely considered that some equipment was either unreliable or insufficient for future / long-term monitoring. The PNBA could invest in some new optics, cameras and drones (multiple uses), whilst the 'raquettes' (mud shoes) pioneered by NIOZ/RUG are proving uniquely effective at PNBA for research on the seagrass-rich mudflats. Teams would welcome availability of boats dedicated for bird and benthos monitoring and research.

The centre at Iwik has strong capacity to develop further as a research centre, and efforts to achieve this are already underway with international partners. With some focused attention, there is a good opportunity to develop a long-term research centre at Iwik, with strong potential for IWC-related activities, including on-site inputting of count data and analysis.

**Threats:** The external threats to monitoring mainly relate to tidal and climatic conditions and disturbance.

## PNBA SWOT ANALYSIS: capacity for IWC monitoring

### STRENGTHS

Well-trained team: 35 personnel with 6 ecogardes

Active participating partners

Training provided in waterbird ID & counting

Standardised IWC count methodology & count units

Availability of logistics: 9 vehicles, 4 boats

Accommodation, catering & meeting facilities for 50 pax

Equipment: telescopes & binoculars

Financial support (BaCoMaB, PRCM, WSFI, BLI, WI)

Capacity for prefinancing the counts

ORACLE database

### WEAKNESSES

Capacity of field teams:

Limited knowledge of the site (mudflats and sabkhas)

Low ID of waders (only 4 people know waders well)

Counting techniques: overestimates & underestimates

Field reporting: descriptions poor

Low capacity in navigation

Some new boat captains not familiar with site

Absence of Imgraguen guides who know site well

Low respect in punctuality in relation to tides

IWC equipment is insufficient, and dedicated boats not always available

Communications: lack of walkie-tallkies & boat flares

Increasing age of experienced field personnel

### OPPORTUNITIES

Renew teams: Prepare replacement staff (10 PNBA agents)

Train young ornithologists (PNBA staff, local community, students, CSOs)

Support academic training (ideally 6 to MSc level)

Strengthen capacity of bird team, including new methods

Involve PNBA agents in research of partners, e.g. NIOZ, RUG, CCMAR

Exchange visits between PNBA and Wadden Sea

Train PNBA personnel in statistics for data analysis

Revitalise the national bird network (PNBA, Natmau)

Exchange experiences between PNBA services

Strengthen surveillance, local development

Safety: First aid kits & first aid training, training in swimming

Training in local environment (mudflats, sabkhas, water depth etc)

Develop / strengthen PNBA observatory & scientific station

### THREATS

Tides: some very low tides

Tides: late low tides (after 17:00)

Weather conditions: low visibility, strong winds

Disturbances: jackals, fishermen, observers

**Figure 9.** PNBA SWOT Analysis on the capacity for IWC monitoring

### 4.1.5 SWOT analysis for monitoring colonial breeding birds at PNBA

Results from the SWOT analysis for monitoring colonial breeding waterbirds in the PNBA are illustrated in Figure 10.

**Strengths:** The PNBA field staff that lead monitoring of breeding birds have relatively long-term experience in this work, backed up by logistical support and equipment. Finances for conducting the monitoring are usually available throughout the breeding season.

**Weaknesses:** Only a few staff usually participate in the monitoring, whilst there can be difficulties in assuring use of a dependable boat and captain. Staff capacity for newer methods of monitoring, such as the use of drones is not adequate for conducting reliable count. The security situation for conducting fieldwork could be improved, including a reliable means of communication.

Tim Dodman

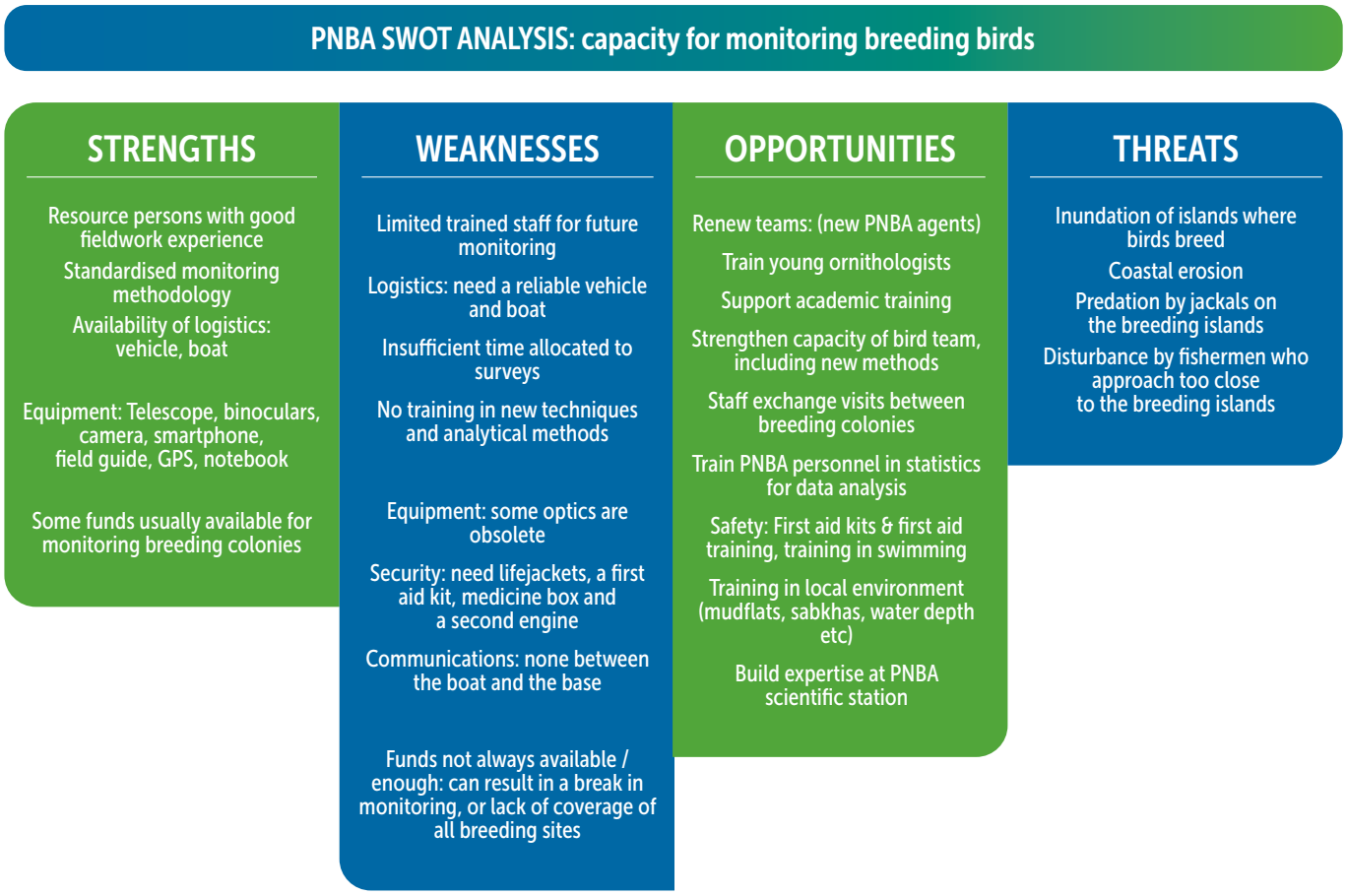


**Figure 10.** PNBA SWOT Analysis on the capacity for monitoring breeding birds

**Opportunities:** As for the IWC, several opportunities identified building stronger field teams, both in bringing more young people onboard and through learning new techniques. Safety was highlighted as a key issue for fieldwork, including communications and first aid. The centre at Iwik has strong capacity to serve as a centre for expertise in research into breeding colonies.

**Threats:** The external threats to monitoring mainly relate to changing climatic conditions, including inundation of breeding islands, predation and disturbance.

### 4.1.6 SWOT analysis for data collection, database management and communications at PNBA

Results from the SWOT analysis for database management and communications in the PNBA are illustrated in Figure 11.

**Strengths: For both IWC counts and breeding bird monitoring, the PNBA uses standard forms and data entry procedures.** The PNBA is one of the few protected areas along the East Atlantic Flyway in Africa to have its own dedicated ornithology database and database manager. The database holds records of IWC counts and data on breeding birds. The database is available for key partners to consult, and is used in compiling reports for the Ramsar Convention. PNBA also has a communications team in Nouakchott and a PNBA Facebook page.

**Weaknesses:** The PNBA database has limitations, in that the team in charge of it is small, and there is rather limited exchange between field staff (ornithologists) and the database manager. IWC data tends to be entered and verified by one person, and the database is not available online nor accessible by some key partners. There is rather limited use of the data, and some recent scientific publications have tended to reference data from other data sources. The database is in need of updating. The PNBA communications team has limited knowledge of the park and its biodiversity, whilst the park website remains static. The PNBA Facebook page is relatively active, but does not present science-based information about the park, including results of IWC counts or breeding bird monitoring.

**Opportunities:** The presence of a park database and staff engaged to manage it and in communications is an important asset for PNBA. There are opportunities to improve database functioning and provide training in new technologies, as well as communication tools. Exchange between field (observatory) and data management staff should be increased to help build a more active working relationship between them and enable extra checking of data by ornithologists. The communications team would also benefit from such exchange

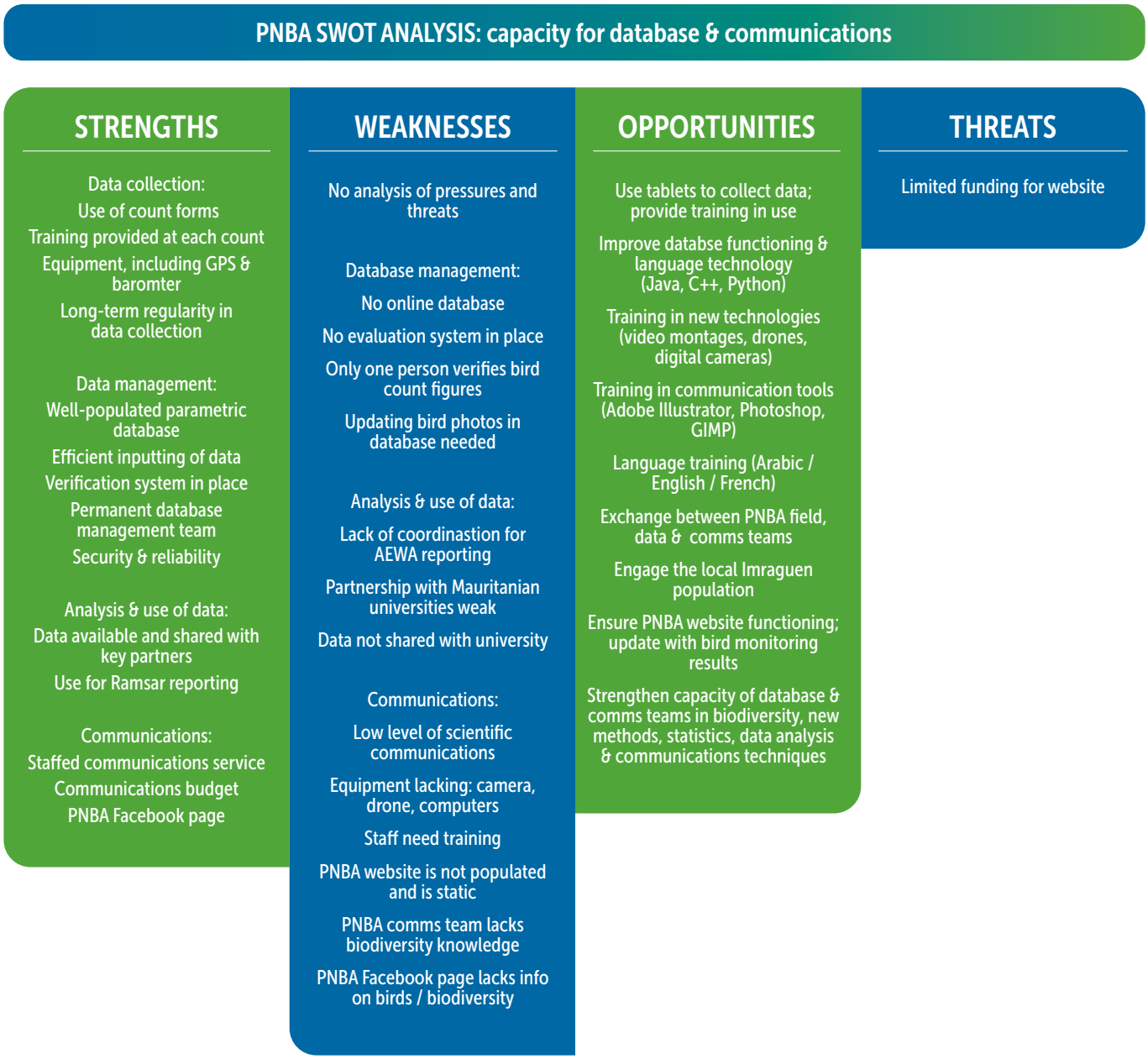


**Figure 11.** PNBA SWOT Analysis on the capacity for database and communications

and more frequent visits to the park, as well as always being there when the IWC is underway. This should help to put out information about birds and biodiversity to complement existing posts about meetings. There is also potential to better engage the Imraguen population in communications. The PNBA website has great potential, but needs time and resources invested in it.

**Threats:** There is limited funding for database development and relaunching the PNBA website.

### 4.1.7 Perspectives for future monitoring of non-breeding and breeding birds at PNBA

The PNBA is a critical site for migratory and breeding waterbirds of high global importance, and monitoring is a key activity for the park and its staff. However, although expertise, logistics, partnerships and equipment are present for monitoring, there are also issues and challenges, for which building capacity can play an important role. Mauritanian teams taking part in long-term monitoring need to be well trained, with mutual support through international systems. Some summary recommendations in relation to capacity building are:

1. Strengthen / renew competent teams at PNBA, including young motivated field staff.
2. Set in place a training programme for field personnel to constantly build experience and capacity, with bird monitoring and research activities throughout the year.
3. Initiate a programme of academic training focused on the PNBA in collaboration with universities and research institutes, and support engagement of PNBA field personnel in research programmes.
4. Build experiential learning more fully into the monitoring programme, especially during the triannual 'total' counts, and ensure that field learning takes place throughout the year.
5. Revitalise a national bird monitoring network in collaboration with national partners.
6. Ensure reliable logistics, equipment and safety for all monitoring programmes.
7. Develop the role and capacity of the PNBA scientific station at Iwik.
8. Review and renew the PNBA (bird) database with external input.
9. Set in place mechanisms and partnerships to share, analyse and use PNBA bird monitoring data, especially for park management and for input to flyway level analyses.
10. Strengthen exchange between PNBA field, data and communications teams, and improve awareness through renewed PNBA website and online biodiversity information.

## 4.2 Sine-Saloum, Senegal

### 4.2.1 Delta du Saloum

The Saloum Delta is a large complex site comprising estuarine waters, mangrove-fringed canals, mud and sand flats, tidal swamps and a number of islands, sandbars and islets in southern Senegal north of The Gambia. The deltas of the seasonal Sine, Saloum and Diombos Rivers make up the Delta du Saloum Biosphere Reserve and IBA, which cover an area of 180,000 ha, of which half is marine, rivers or inundated areas, one third of which is intertidal. The area includes a national park, a community reserve and three community based MPAs. North of the main Saloum River channel, the islets are sandy and subject to infrequent tidal flooding. There are seasonal floodplains and salt flats. Mangroves growing on mud islets dominate the area south of the river channel, and a network of inter-linking channels and seasonal freshwater streams flow into the delta from the landward side. The site is important for a wide variety of waterbirds, some occurring in large congregations, including breeding sites for gulls and terns on the sandbars and islands. The central intertidal zone is a low tide feeding and roosting area, especially for migratory waders and herons.

### 4.2.2 Waterbird counts in the Saloum Delta

A few waterbird counts were carried out of parts of the Saloum Delta in the late 1970s and 1980s along with other coastal wetlands, but the whole delta was not covered until an expeditionary survey from 4-30 January 1997 (Schepers *et al.* 1998). Coverage of different sectors was estimated at between 70% and 100%, and in total 124,738 waterbirds were counted, of which 80% were waders and gulls. For the purpose of the counts, the delta was divided into four main zones and a number of count units within each zone. Regular, invariably partial, IWC counts in the delta started in 1991 and have taken place in most years since, led by the Senegal's Direction des Parcs Nationaux (DPNS). There are some overlaps between the digitized count units currently used, whilst large parts of the delta do not seem to have digitized count units.

### 4.2.3 Mission to review monitoring capacity at Saloum, January 2025

WSFI and BirdLife International conducted an evaluation mission of the operation of the IWC in the Saloum Delta by DPNS in January 2025. Activities organised by DPNS included a refresher workshop for local organisers and observers, numbering 40 participants, followed by two days of waterbird counts. The evaluation team noted a number of weaknesses relating to count planning, coordination and data use, and to carrying out counts in the field.

### 4.2.4 SWOT analysis for monitoring waterbirds in the Saloum Delta

Results from the SWOT analysis for monitoring waterbirds in the Saloum Delta are illustrated in Figure 12.

**Strengths:** Most of the Saloum Delta is under some form of protected area status, and IWC coordination structures are in place, with meetings held before counts and some experienced local field agents. Results are usually delivered as Excel files and paper forms to the DPNS NC.

**Weaknesses:** The following weaknesses were identified largely by the evaluation mission:

- **Weaknesses in coordination and data use**
  - **Overlap of protected areas within the delta:** Overlap presents a challenge for monitoring, creating confusion and competition between offices of different protected areas.
  - **Coordination:** Each protected area within the Saloum Delta has its own coordination structure and reports IWC results to the NC of Senegal. Parts of the Delta not really covered by coordination. Pre-count coordination meetings may not cover practical planning issues, such as boundaries between coordination units, and how to cover different regions . Maps are not always available, e.g. to highlight protected area boundaries and count units. There was no inventory about weaknesses, capacity and material needs of the different protected areas in the 2025 meeting. Some materials were lacking (binoculars, telescopes).
  - **Digitized Count Units not used:** Observers relied largely on physical recognition and knowledge passed on by more experienced participants. As several interpretations exist about the extent of areas, this leaves room for error. The need to cover whole areas completely is not widely understood. Observers are not familiar with using maps to find locations.
  - **Lack of local databases, data use and interpretation of results:** Each site lacked its own local database, so was unable to per-

form analyses and use results for adaptive management. Conducting the IWC is an annual task to be conducted, but there is limited understanding of how it could contribute to site policy and management.
- **Centralised data management:** In 2025, teams at each site filled out physical environmental and count data forms, which were sent to the DPNS NC for integration into a national database. Site conservators were initially not able to submit data forms online, though this issue was subsequently resolved, and some teams had since also submitted data electronically through Jotform. Verification of data is important, but can be done whether data are submitted on forms or online, through the use of apps.

- **Weaknesses in carrying out counts in the field**
  - **Limited bird identification capacity:** Only a few agents at PNDS are proficient in bird identification, who are mostly ageing or retired. Most counters have only limited capacity, especially for identification of waders, terns and gulls.
  - **Data recording errors:** Errors in data recording can occur at different steps. The group reporter is often unfamiliar with bird names. Field notes are used later to sum totals and find the right species on forms. Results on paper forms are typed into an Excel form, often by someone not knowledgeable about birds. Mistakes can be made at each of these steps.
  - **Bird counts and tides:** Site coordinators need a good understanding of count procedures in relation to tidal movements at this complex estuarine site. Delays can result in counts later in the day being done at low water, so that birds counted at high tide in the morning may be counted later elsewhere at low tide (e.g. cormorants, gulls).
  - **Lack of involving the right people:** In the Saloum Delta, bird counting is conducted exclusively by park and reserve agents, not all of whom know birds very well. Teams may comprise people who are not committed to the counts who may lose interest and disturb concentration or render logistics more difficult due to the limited boat and car capacity. Knowledgeable counters from other agencies or NGOs do not seem to participate.

**Opportunities:** With a number of protected areas within the Saloum Delta, there are teams available to carry out IWC counts, which is already understood as a necessary annual activity. However, there is potential to improve coordination between the delta's protected areas, to improve understanding of tidal conditions and their relationship to conducting counts, and to strengthen local teams. The local teams would benefit from training in field and skills and count procedures, and there is a need to build capacity especially of younger staff and ecogardes.

An agreed system of counting units covering the whole delta should be established. By introducing a digital map system for counters on mobile phones (for instance locus maps) would facilitate the use of these units and navigation in the field.

There is potential to establish a site database for PNDS and the wider delta and improve more regular use of online data submission, especially for the IWC. Errors in data collection and transfer could be

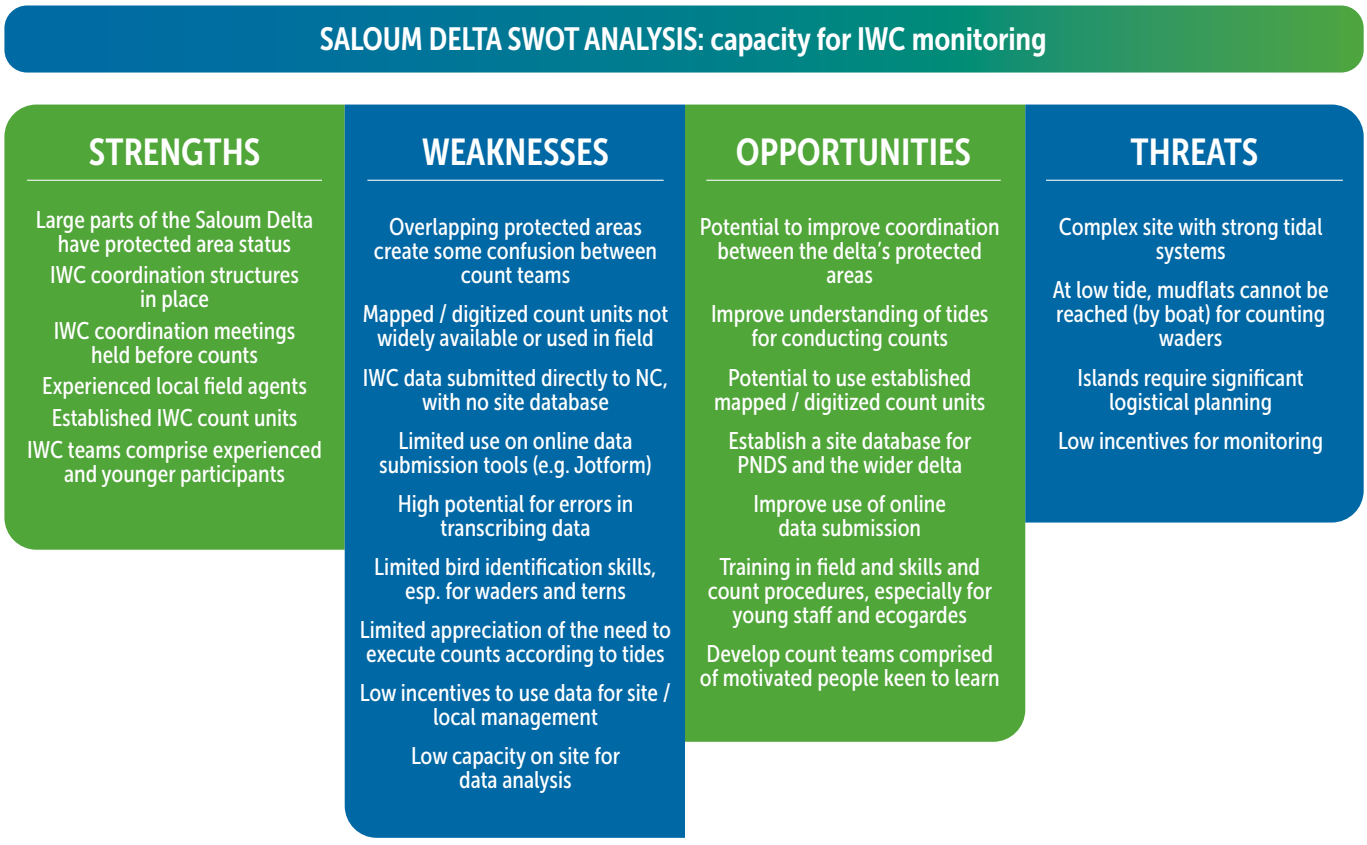


**Figure 12.** Saloum Delta SWOT Analysis on the capacity for IWC monitoring

reduced through careful checks of the paper forms and Excel form by someone who knows the site and its birds well.

As for other sites, there is potential to develop strong count teams comprised of motivated people who are keen to learn. In Saloum, this could be achieved through greater engagement of ecogardes and local NGOs.

**Threats:** The external threats to monitoring mainly relate to tidal conditions. At low tide, the mudflats cannot be reached (by boat) for counting waders.

### 4.2.5 General recommendations for improving the IWC in the Saloum Delta

The evaluators produced general recommendations for improving the IWC in the Saloum Delta:

1. Coordination Meetings: Organise a pre-count coordination meeting to agree on and map count units, and assign responsibilities for specific sites.
2. Unified Approach for Saloum: Treat Saloum as a single entity when organising the IWC to promote collaboration, exchange expertise and share material resources among sites.
3. Enhanced Coordination: Strengthen coordination within the Saloum Biosphere Reserve to enable sites to work collaboratively.
4. Engage the IWC NC, and submit data online (e.g. Jotform).
5. Establish a pool of dedicated local counters selected according to their motivation and skills, and invest training in this group. Involve this group in more fieldwork beyond the January counts, leading to local employment prospects.
6. Create a local database can be used for management planning and decisions, recognising that monitoring results should contribute to local management decisions and site evaluation.
7. Plan local workshops to present the IWC results.

### 4.2.6 SWOT analysis for monitoring waterbird breeding colonies in the Saloum Delta

Results from the SWOT analysis for monitoring waterbirds in the Saloum Delta are illustrated in Figure 13.

**Strengths:** The Saloum Delta has some of the most important breeding gull and tern colonies in West Africa, and the key breeding islands are protected. DPNS thus has commitments to monitor and manage the colonies, and there is also interest and support from international partners. There are several experienced local field agents who know the birds and their breeding behaviour well and who can navigate through the delta. They have benefited from learning during interna-

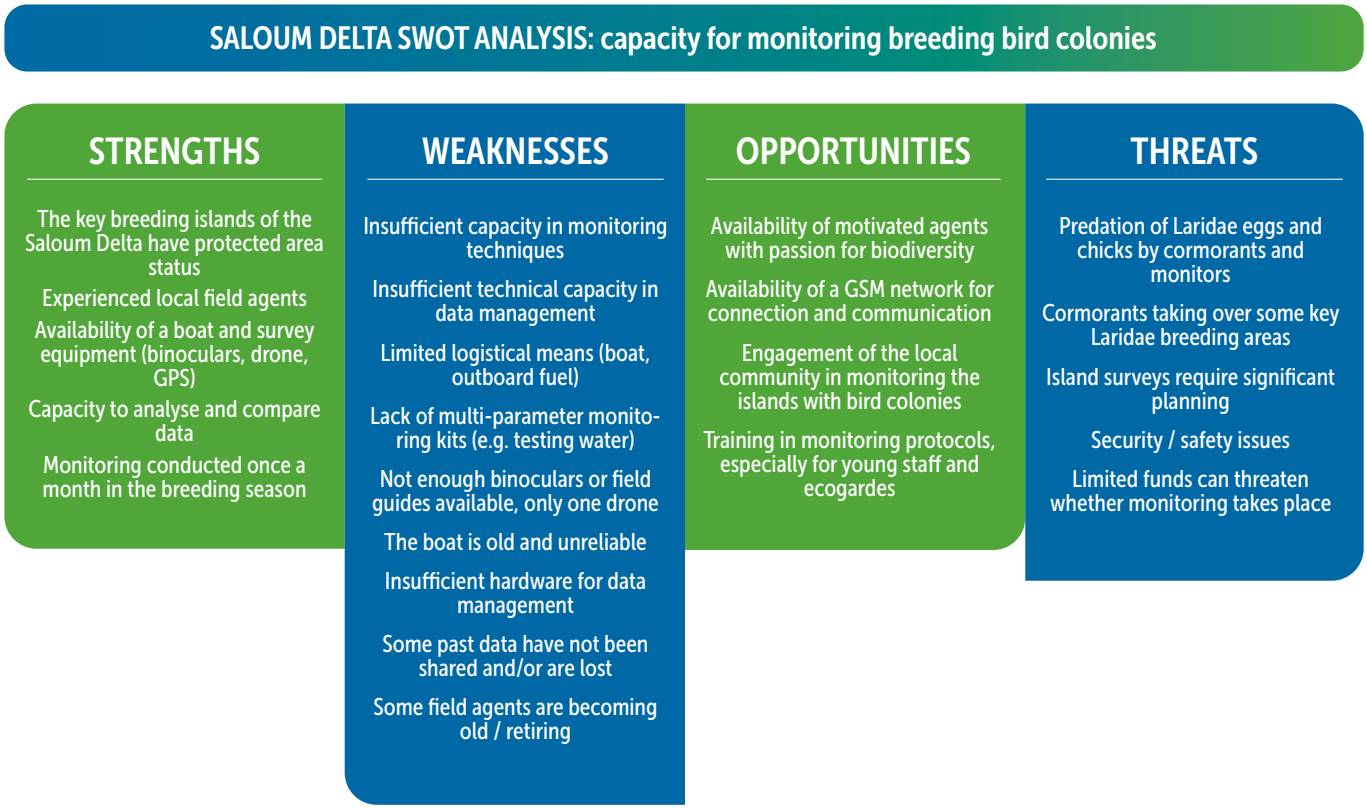


**Figure 13.** Saloum Delta SWOT Analysis on the capacity for monitoring breeding bird colonies


**Participants in a regional workshop sharing waterbird identification skills near Palmarin in the Saloum Delta**

tional missions to survey and monitor the colonies, including training in drone use. There is availability of a boat and survey equipment (binoculars, drone, GPS), and there is some capacity to analyse and compare data. Monitoring conducted once a month in the breeding season, funds permitting.

**Weaknesses:** There is insufficient capacity in monitoring techniques and data management, with too high a dependence on a limited number of older experienced agents. There are limited logistical means, and the boat used is close to being obsolete. There are also not enough binoculars or field guides available, and there is only one drone (thus a high dependence on it). In terms of data management, there is insufficient hardware, and some past data have not been shared and/or are lost.

**Opportunities:** The availability of motivated agents with a passion for biodiversity is a key opportunity for the long-term implementation of the monitoring programme. Availability of a GSM network is important for connection and communication, including for the safety of survey teams.
It is important for DPNS to build and maintain strong engagement of the local community in monitoring the bird colony islands, and to encourage local ecogardes to take part, including through training, especially in monitoring protocols. The local DPNS staff could manage and use data if they had two quality hard drives and two laptops for this purpose.
**Threats:** Predation is an increasing issue for breeding gulls and terns in the Saloum Delta, especially by Great Cormorants *Phalacrocorax carbo*, which are also taking over some key breeding areas, including key islands. Security / safety issues are relevant and need to be taken into consideration when surveying remote islands. Limited funds can threaten whether monitoring takes place; external support has been important but is not always reliable.

## 4.3 Bijagós Archipelago, Guinea-Bissau

### 4.3.1 The Bijagós Archipelago

The Bijagós Archipelago is a group of 88 islands and islets off the coast of Guinea-Bissau, recognised by three MPAs, and its classification as a Biosphere Reserve and Ramsar Site. A core area of the archipelago has recently been adopted as a UNESCO World Heritage Site. The archipelago has extensive mangrove forests and about 450 km$^2$ of intertidal flats, which sustain highly diverse benthic communities. The site holds internationally important numbers of regional populations of several migratory shorebirds, but steep declines are being

observed in the Bijagós Archipelago, and conservation, research and monitoring efforts are essential to gather baseline knowledge on waterbirds, their habitats and the ecological processes they depend upon (Henriques *et al.* 2022). Much of Guinea-Bissau's coastal zone is included within its extensive coastal IBAs, which include the Bijagós Archipelago and Ilha Bolama – Rio Grande de Buba (Dodman *et al.* 2004). The Bolama-Bijagós region is very large and is divided into three ecoregions.

### 4.3.2 Waterbird Monitoring in Guinea-Bissau

The first bird surveys of coastal wetlands were carried out in the 1980s, followed by a research expedition in 1992-1993, aerial surveys in 1994 and a coastal waterbird count in 2001, when bird numbers in the Bijagós Archipelago were estimated at around 750,000 (Dodman & Sá 2005). CWSS supported monitoring efforts in the early 2000s, and institutions involved were the Coastal Planning Office (GPC), the National Institute for Studies and Research (INEP) and later the Institute for Biodiversity and Protected Areas (IBAP) and the Organisation for the Defence and Development of Wetlands in Guinea-Bissau (ODZH). Monitoring and other activities were disrupted by periods of civil unrest.

Guinea-Bissau has been participating in the total counts of the IWC, and Wetlands International, WSFI and BirdLife International have played key roles in the process to leverage and operationalise network needs. The Guinea-Bissau bird counting network includes one National Coordinator, three provincial coordinators, and 40 people who form seven counting teams at the national level and who take part in the total January waterbird counts. The network aims to bring conservation institutions together to strengthen their capacity to act throughout the country and improve knowledge about birds, through developing capacity, promoting data collection and collaboration, and raising awareness.

### 4.3.3 Training and capacity building

There was only one qualified person available in Guinea-Bissau when CWSS supported an initiative to strengthen knowledge and capacity for the conservation of migratory birds in Guinea-Bissau in the late 1990s, but at least eight people were trained in 1997 and 1998. However, after the political-military conflict of 1998, these people emigrated and have not returned. The NGO ODZH's priority is to build a foundation for the future, carrying out activities linked to studies of wetlands and birds. During the IWC total counts, training the network continually took place, including in the application of counting techniques and the use of maps of areas with their respective polygons, reference points and counting units. The extent of coverage depended on the financial conditions, the number of counters, equipment, logistical availability and type of count, among others. As the network evolved, there was a need to train technicians in ornithology to equip them with the technical resources needed to carry out bird counts, and in database management.

The institutions involved in bird conservation prioritised training and capacity building during the cooperation between Guinea-Bissau and CWSS, whilst Wetlands International was the pioneering organisation in training GPC technicians. New people were encouraged to join the IWC network through a series of capacity building workshops carried out in 2018 and 2019 and one-off pre-count retraining in some years (2018 to 2019, 2021, 2022). Training was also provided in 2009 to monitor gull and tern breeding colonies, and monitoring of colonies was carried out in 2013 and 2017, with an emphasis on the use of drones, introducing advanced bird monitoring technologies. Between 2019 and 2023, regular colony monitoring was carried out as part of the Alcyon Programme funded by MAVA, introducing the practical aspects of learning by doing.

### 4.3.4 Workshop to review monitoring capacity in Guinea-Bissau, April 2025

With the support and input of WSFI, ODZH and IBAP organised a workshop on 16 April 2025 to bring people together from the different institutions and sites to review the capacity for monitoring in Guinea-Bissau, especially for the Bijagós Archipelago. A SWOT analysis was carried out and discussions held about monitoring, including recommendations for the future. After the workshop, ODZH also completed a review of capacity needs for monitoring breeding waterbirds in Guinea-Bissau.

### 4.3.5 SWOT Analysis for monitoring waterbirds in the Bijagós Archipelago, Guinea-Bissau

Results from the SWOT analysis for monitoring waterbirds in the Bijagós Archipelago are illustrated in Figure 14.

**Strengths:** There is institutional capacity in Guinea-Bissau for waterbird monitoring, especially within IBAP and ODZH, plus involvement DGFF and GPC. IBAP and ODZH also have strategic documents with strategies and plans to conduct waterbird monitoring and wetland conservation. Guinea-Bissau has a Framework Law on Biodiversity and Protected Areas and a Forestry Law, which outline measures for conservation. IBAP has the logistical means needed for waterbird counts, especially boats with captains, and equipment such as binoculars and field guides. It also has practical equipment needed for fieldwork of longer duration, such as tents. It has staffed centres located on different islands within the archipelago. Institutional and technical collaboration for monitoring is good, although it could be improved. International partners play an important role in supporting the monitoring. A number of technicians have received academic training in areas relevant to waterbird monitoring. There is a reasonable level of expertise in practical fieldwork, such as identifying and counting birds, conducting total bird counts of the archipelago, and tracking fish-eating birds. IWC training has been organised, yielding moderate results.

**Weaknesses:** The effective monitoring of waterbirds across the Bijagós Archipelago presents numerous challenges, due to the extent of the site, the distances between islands and the impacts of the tides. IBAP has insufficient resources and equipment to support regular monitoring and especially for total counts. Site samples can only be counted during low tide, as during high tide waterbirds dis-

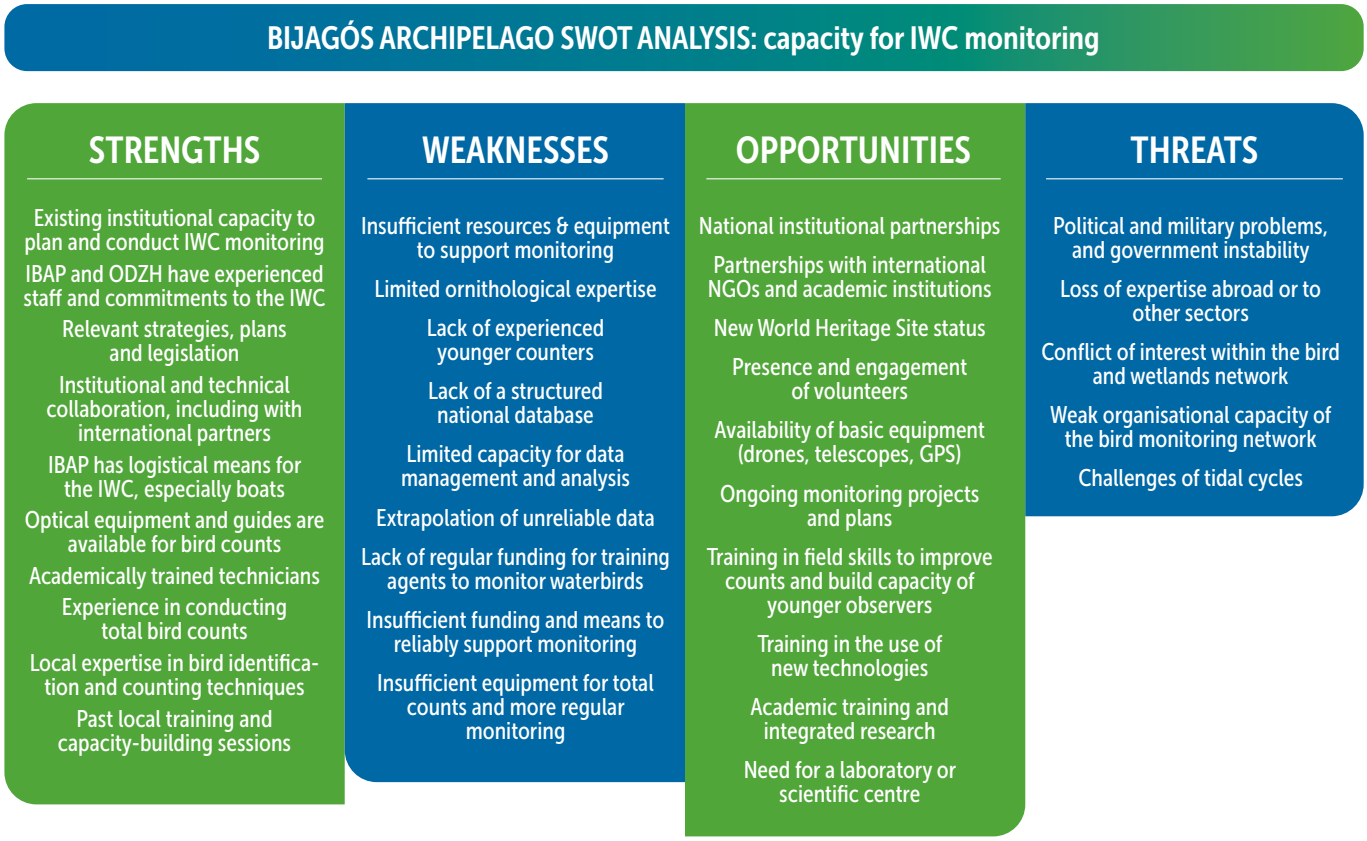


**Figure 14.** Bijagós Archipelago SWOT Analysis on the capacity for IWC monitoring

appear into the mangroves, and methods of extrapolation are needed to reach estimates of total populations. Such methods are not fully developed yet and need to be translated into a clear work protocol. There is also a limited pool of technicians with capacity to identify and count birds, and more experienced observers are approaching retirement.

There is no structured national database for managing waterbird count data, and thus only low capacity to analyse data. There is also a lack of technicians specialised in data processing, posing risks such as the extrapolation of unreliable data. Further, data are not analysed and used at a national or local level, questioning the relevance of the IWC nationally. Funds for the IWC and more regular bird monitoring are limited, as well as for training.

**Opportunities:** The strong institutional partnerships in Guinea-Bissau and relations with key international partners, especially NGOs and academic institutions, present good opportunities to reinforce waterbird monitoring in the Bijagós and at other coastal sites. The recent designation of key parts of the archipelago as a World Heritage Site is timely, in that Guinea-Bissau will need improved systems in place to monitor the site. Steps can be taken to strengthen the network in Guinea-Bissau, with a package of training, including building capacity of field personnel in the identification and counting of birds, training in the use of new monitoring technologies. Volunteers already take part in monitoring and basic equipment is available. Some activities can be supported through ongoing and upcoming projects. Higher academic training would enable data analysis, integrated monitoring and research. There should be a capable laboratory or scientific station in Guinea-Bissau that can coordinate and support scientific research in the Bijagós.

**Threats:** Guinea-Bissau has a history of political and military problems with government instability that has interfered with activities of the institutions involved in bird monitoring. Such situations have resulted in technicians leaving the country, whilst others have sought improved salaries in development projects. There has been conflict of interest within the bird and wetlands network and its leadership. Overall, the network has a weak organisational capacity.

The tidal cycles present logistical challenges to monitoring, including timing accessibility of mudflats while also covering a large complex site.

### 4.3.6 SWOT Analysis for monitoring breeding bird colonies in Guinea-Bissau

**Strengths:** There is institutional capacity for monitoring the breeding bird colonies in Guinea-Bissau, which is coordinated annually by IBAP, ODZH and GPC. There are also some established international partnerships. Experience gained through IWC counts, such as in bird identification and counting, benefits this work, and a number of field personnel have local knowledge about the breeding colonies. Past projects have helped to build logistical and technical capacity for

monitoring, and technicians have experience of counting in colonies, the use of GPS and drones and of sampling methods. Local guards and community members are involved in the monitoring and are able to identify the species, count nests and chicks and record disturbances. There is some logistical capacity for monitoring, including boats and canoes. There is capacity for reporting data and basic analysis.

**Weaknesses:** Only a few technicians have received advanced training in identifying the different age classes of gulls and terns, in methods of statistical sampling to estimate the colony sizes, and in treatment of drone images by GIS. There is insufficient equipment for covering different sites, including drones, surveillance cameras, sound equipment and GPS units, nor are there enough people trained in their use. There is no national database for storing and analysing data, and low capacity in statistical analyses. The key personnel involved are aged,


**Figure 15.** Bijagós Archipelago SWOT Analysis on the capacity for monitoring waterbird colonies


**Counting breeding waterbirds in Guinea-Bisssau**

which renders intensive field activities difficult. Not enough young people have the ability or motivation to become actively involved in ecological monitoring, and there are not enough personnel to cover different colonies simultaneously. Funds are insufficient and short-term for monitoring the colonies, and the situation has worsened due to an increase in the price of fuel. There is a lack of local incentives for conservation if communities do not perceive direct benefits.

**Opportunities:** Guinea-Bissau's ratification of MEAs creates opportunities for technical and financial support, while international NGOs have supported monitoring, research and training within the bird colonies. The colonies are included in national biodiversity programmes and integrated into wider monitoring networks, but the monitoring could be integrated better into protected area management plans (with a budget), climate change adaptation plans and sustainable development programmes. There are possibilities for joint training and exchange with other countries that support breeding colonies. Improved cooperation with universities and NGOs would provide support in data management and analysis, including in GIS.

Co-management arrangements should be strengthened with local communities for data collection and monitoring. There is potential to involve youth, volunteers and students completing studies and learning about monitoring techniques. It is recommended to build the monitoring of protected sites into the regular activities of protected area programmes, which would also strengthen a sense of local ownership. There is an opportunity to improve communication and awareness through local radio and social networks, as well as environmental education relating to the colonies in schools and local communities. The colonies could also become symbols of cultural identity and become part of careful ecotourism initiatives.

Equipment is needed, including availability of low-cost drones for aerial monitoring of colonies. Training needs to be provided in this and other monitoring protocols, especially for younger people, also in the use of simple GPS and mobile applications (eBird, SMART) for field data collection, and of free data management and analysis tools (QGIS, Google Earth Engine). The availability of motorised boats is important, as well as comprehensive field kits, including communication. The creation and maintenance of a centralised database is needed to securely enter data and analyse trends, and to use tools to facilitate this. Guinea-Bissau should designate a focal point for this work.

It is necessary to establish competent field teams that do not need supervision, and provide training, including in field skills, use of drones and analysing data. Refresher training should be provided before each breeding season, especially to engage new / young participants.

**Threats:** Rising sea levels affects the sandbanks and breeding sites. Storms and heavy rains can render access difficult during the breeding season, and unpredictable weather conditions can disrupt plans and impact security. Extreme weather events affect breeding behaviour. Access to the colonies is challenging, requiring good logistical resources and planning. Breeding colonies are affected by disturbance from artisanal fisheries and visitors, while collection of eggs and hunting of birds remain a threat. Colonial breeding birds are also subject to predation, disease (e.g. avian influenza) and competition with other species that can take over breeding sites. Habitat destruction, coastal development and oil and gas exploration may have longer-term impacts.

In terms of financial support, the monitoring depends largely on short-term projects and thus risks being discontinued. There are no budget lines within IBAP or ODZH for annual or seasonal monitoring of the colonies.

### 4.3.7 Conclusions and recommendations for improved monitoring in Guinea-Bissau

Energy needs to be invested in training in and building human resources for monitoring through the institutions involved in the protection and conservation of wetlands and avifauna. The waterbird monitoring network faces significant challenges, especially the shortage of qualified human resources, materials and funding. It is also necessary to strengthen institutional collaboration. Funding is needed for training, acquisition of materials and introducing new technologies. The network needs financial and human resources to ensure effective and continuous monitoring. Specific recommendations are:

1. Develop and strengthen the waterbird monitoring network in Guinea-Bissau and improve collaboration between institutions.
2. Bring new people into the network, especially motivated younger participants and volunteers, and build incentives for their engagement.
3. Provide training for participants in the network, both for field activities and for data management and analysis.
4. Provide refresher training for field teams before IWC counts and before the bird colony monitoring season.
5. Establish one or more databases for storing and managing data from the IWC, breeding bird monitoring and other parameters.
6. Build capacity for data analysis and reporting, and contribute results to Ramsar and AEWA reports.
7. Integrate monitoring into the programmes of protected area, Ramsar Site and World Heritage Site management, and ensure a budget is allocated to this.
8. Secure long-term funding for monitoring.

## 4.4 Conclusions from PNBA, Saloum Delta and Bijagós, with links to other sites

An overview of strengths, weaknesses, opportunities and threats from all three sites is presented, with some concluding elements built into the opportunities.

### 4.4.1 Strengths

Parts or all of the three key sites are under formal protection and management, and all have participated in the IWC and monitoring of breeding bird colonies over many years. All have strong international designations, in part due to their global importance for waterbirds. PNBA stands out as being one distinct management unit under one management authority, which is responsible for coordination of monitoring. The Saloum Delta has a number of protected areas, with different teams that need to work closely together to achieve good results from monitoring. Although the whole Bijagós Archipelago is a Biosphere Reserve, different islands have different protected area status and teams.

At all sites and/or within each country, there are full-time staff and some experienced personnel who have been involved in waterbird monitoring for many years. There are also links between the protected area authorities and other national agencies, e.g. NGOs, universities, and with international partners, including specific support / co-operation for the IWC. At PNBA in particular there are long-term links with international research institutions focused on wetlands and waterbirds, and a research station is under development. All sites also have varying levels of logistical capacity and equipment for monitoring, which is essential given that these are all large complex sites.

Some training has taken place at all sites, while the value of experiential learning (learning by doing) cannot be underestimated; this has resulted in some of the most experienced and competent personnel. For the IWC, count units have been established with international partners, and planning usually takes place before the counts through site-based meetings. Data are submitted at the national and international level. PNBA is unique in having its own database, with dedicated staff for its management.

Some of these strengths are shared with other sites along the flyway. Many sites along the East Atlantic Flyway in Africa have protected status and are staffed, and there are at least some experienced personnel engaged in monitoring. Long-term monitoring takes place in Ghana's coastal wetlands, with close collaboration especially between a university / research institute and the government, and clear monitoring objectives in place. Training workshops have taken place at several sites in Morocco, where there is quite a high level of engagement if university graduates in monitoring and research activities at coastal sites.

### 4.4.2 Weaknesses

Whilst there are experienced personnel at all sites who take part in monitoring, there is a common tendency for experience to be vested in older persons, with a general lack of younger motivated personnel taking part. There is also, overall, low capacity in ability to identify some birds, especially waders, and to carry out standardised counts. Surveys and other fieldwork only form a part of the work of most personnel, so that routines are not always maintained, and the opportunity to develop good field skills through experiential learning throughout the year is limited. Few personnel involved in monitoring are educated in ecology and nature management, and there is a lack

of capacity for conducting scientific analyses and publishing results from monitoring. Apart from a few specific studies, this tends only to be done at the flyway level through international partners, not led by the national institutions themselves.

Coordination of the IWC is not an easy task for large complex tidal sites, and carrying out the surveys requires significant planning with the availability of reliable logistics and good teams. Although there are some structures in place for monitoring, established count units, maps and procedures are not always used, and incentives to achieve accurate results to use on site for adaptive management and policies are low. The impact of tidal cycles on the plans is not understood or respected by everyone taking part in the counts.

There are logistical and equipment challenges at all sites, with some reports of old or obsolete boats and/or engines, not enough experienced boat captains, and a lack of some important safety and communications equipment. Drones are nowadays essential for monitoring breeding colonies; these are in short supply, as well as skilled drone operators. Capacity for different types of integrated monitoring is generally low, such as the reading of colour rings and analysis of results.

There is a general deficit in efficient uploading and compilation of results, in management of the data, and especially in national or site-based analysis and use of the data. This can lead to questions about the usefulness of or need for the monitoring programme. Data sharing is not always carried out, especially with (potentially) valuable partners, such as national universities and NGOs.

The financing of both non-breeding and breeding bird monitoring is generally not reliable or regular, at least to the amounts needed for conducting the surveys effectively and as completely as possible. There is a high dependence on external funds, especially for the 'total' January counts, and for coordinated monitoring of breeding bird colonies. Some external funds are project-based and short-term.

Many of these weaknesses are shared by sites along the flyway. It is a challenge in most countries to undertake field monitoring even once a year, let alone more regular monitoring, and to secure motivated teams with incentives that are not based on finances, such as per diems. Using and analysing data at the national or site level rarely seems to take place in most countries. Funds for monitoring widely depend on external support, and the availability of logistical needs and decent equipment is often lacking.

### 4.4.3 Threats

The complexity of all sites and their tidal cycles and weather, especially impacting travel in small boats and access at low tides, present the most significant threats to monitoring. Disturbance is also an issue that can impact results. Inundation and erosion of breeding islands is significant, as well as predation of eggs and chicks. The (un) availability of external funds for monitoring is a constant risk, while low incentives for monitoring also presents a challenge.

### 4.4.4 Opportunities

There are significant opportunities to improve capacity for waterbird – and wetland – monitoring at all three sites. A key opportunity is to **invest in teams**, comprising site-based staff, ecoguards drawn from local communities, staff and volunteers of national NGOs and university students. Some teams need renewal, with employment and/or engagement of younger motivated personnel. **Training** courses and workshops are important opportunities for personnel development, while all sites have the capacity to strengthen the value of **learning by doing**, by ensuring relevant field activities take place throughout the year and by close mentorship of younger members with older experienced personnel. The 'total' IWC counts and research programmes led by international institutes also provide opportunities for significant experiential learning. Providing training in new techniques or certificates for specialist training also increase incentives.

**Building site-based institutional capacity** is vital for effective monitoring. Improving coordination and setting out clear monitoring structures are vital, such that all members of teams understand the objectives, their role and the importance of key elements, such as timing in relation to tides and count unit boundaries. Maintaining, replenishing, renewing and updating logistical and technical **equipment** should also be seen as an opportunity, although clearly it is linked to challenges in securing funds. Likewise, establishing or upgrading a site-based database and building **capacity for analysing and using data** is an opportunity to improve local management, with numerous long-term benefits. Key field personnel could also be trained in data management and analysis.

The sites' international significance for migratory species and the challenges of monitoring them due to their complex nature present excellent opportunities for **strengthening partnerships** with national and international partners. Partnership with institutes in Europe and international NGOs can bring in important technical and financial support, with shared objectives in determining the trends and status of shared migratory birds. Monitoring will also benefit from stronger national partnerships between government agencies, NGOs and universities, whilst positive local engagement is essential.

# 5. Perception of capacity for waterbird monitoring along the East Atlantic Flyway in Africa

The perception of capacity for waterbird monitoring along the East Atlantic Flyway in Africa was assessed through 28 interviews/ discussions with individuals involved in delivering capacity building, engaged in monitoring, organising waterbird counts or working with data. Interviewees were drawn from selected countries, international NGOs and other institutions. The countries included within the interview-based assessment were: Morocco, Mauritania, Senegal, The Gambia, Guinea-Bissau, Ghana, Benin and Angola. International partners included were BirdLife International, Office français de la biodiversité, the Tour-du Valat Research Institute, BirdEyes, Wetlands International and the Wadden Sea Flyway Initiative, which have all been closely involved in building capacity for monitoring in Africa.

The interviews were designed to be informal in nature, enabling interviewees to express their opinions in relation to capacity building for monitoring, rather than sticking to set questions. Although this approach meant that some interviewees did not contribute information to some specific aspects, it resulted in most interviewees expressing what they perceived to be priority issues. Interviewees were encouraged to summarise the status of capacity for monitoring – both positive and negative aspects, and to consider priorities for improving capacity for monitoring in the future. Assessing capacity needs for improved institutional and coordination capacity was included. Information was provided on knowledge gaps in relation to monitoring, and the capacity needs in relation to filling these gaps. Issues of building capacity into organisational programmes / work plans and sustainability were also discussed.

The issues mentioned in each interview were compiled into different categories, with the number of messages per category resulting in a ranking of issues. These are presented below according to weaknesses, strengths and future needs.

## 5.1 Perceived weaknesses impacting capacity for monitoring along the East Atlantic Flyway in Africa

Field skills were widely considered as a weakness across the flyway in Africa, representing 25% of responses (Figure 16), including a difficulty in identifying birds, especially waders, and a low capacity to count large flocks of birds. Other field skills issues noted were a lack of trained personnel in protected areas, a loss of skilled personnel through high turnover and the ageing of skilled personnel, resulting in either their loss (or imminent loss) due to retirement or promotion.

Data issues were recorded as the second most perceived weakness (16% of responses), especially a low capacity to analyse and use data, with no systems in place to facilitate this. In many countries there is no central database for waterbird data or a reliable data storage facility and backup. Such issues inevitably result in difficulties to access and use data. Problems in data sharing were also noted in some countries, resulting even in some counters not willing to submit data to the IWC National Coordinator. In some countries, data compilation was largely in the hands of one person.

The principal weakness identified relating to finances (14% of responses) was the often very low level of financial support for monitoring provided by governments. Many waterbird counts were largely dependent on external funds.

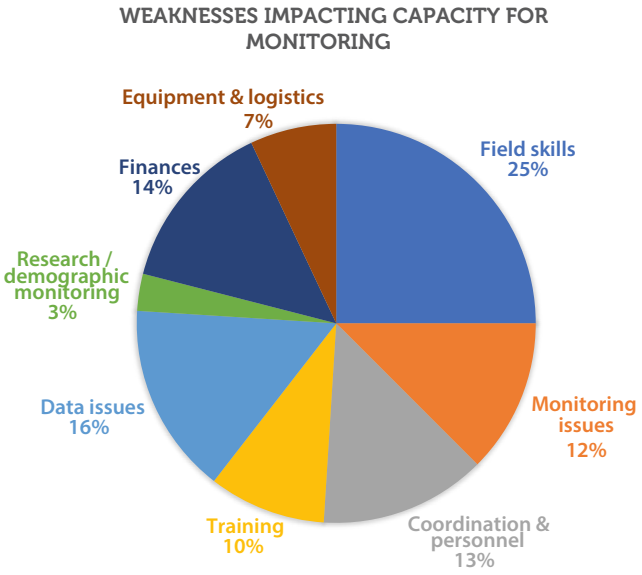


**Figure 16.** Perceived weaknesses impacting capacity for monitoring along the East Atlantic Flyway in Africa

Coordination and personnel issues scored 13% of perceived weaknesses, including weak national coordination of the IWC, and in some areas, low levels of motivation, incentives and interest, including by senior managers. Government bureaucracy and recruitment issues were also noted.

A key issue identified that was contributing to weaknesses in monitoring (12% of responses) was that very little waterbird monitoring was conducted between January counts. Participants need wider opportunities to improve their field skills than January counts alone, and new skills need to be maintained and built on. At some large sites, successful monitoring requires complex planning needs, and capacity for this is inevitably an issue. An interesting point made was a priority imbalance in some monitoring teams, with some prioritising looking for charismatic birds, such as African Fish-eagle *Haliaeetus vocifer* over the more difficult task of carefully scanning mudflats counting waders.

Although a range of training activities have taken place or are

underway, it was noted by some respondents that there was no ongoing formal and/or systematic training in monitoring. Also in relation to training, a lack of capable trainers was noted. In terms of equipment and logistics, there was at least one response from each country that there was a lack in equipment, and/or that equipment was of poor quality or not well maintained.

## 5.2 Perceived strengths contributing to capacity for monitoring along the East Atlantic Flyway in Africa

The key strength noted (43% of responses, Figure 17) was that some training in monitoring had been taking place or was underway, often provided by international partners. The development of the MSc in Ornithology, Conservation and Development at Gaston Berger University in Saint-Louis, Senegal, was also noted positively, complementing the anglophone MSc in Conservation Biology at APLORI, Jos, Nigeria. A new very promising development is the MOOC in identifying and counting waterbirds in North and Sahelian Africa, being developed by OFB, TdV and FAO. This online course, initially only available in French, will be free, and will focus on North and Sahelian Africa. However, no doubt it will be very valuable for other regions, and there are plans to develop the MOOC in other languages.

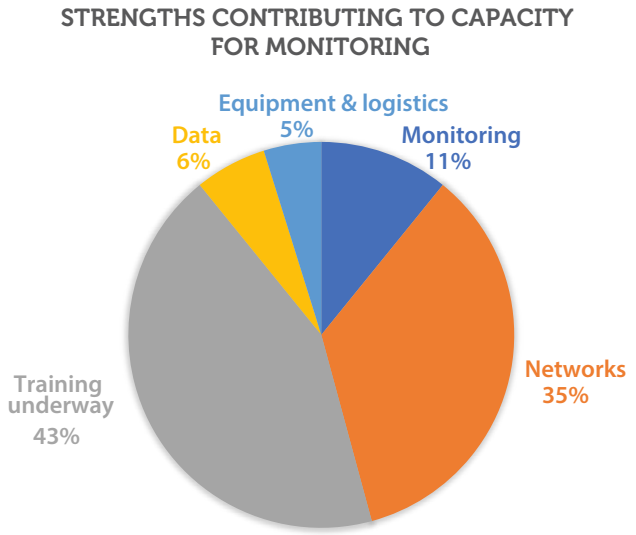


**Figure 17.** Perceived strengths contributing to capacity for monitoring along the East Atlantic Flyway in Africa

Networks were also noted as a strength (35% of responses), including the presence of strong NGOs involved in monitoring, dedicated teams in some areas with skilled people contributing, and the contribution of volunteers.

Although monitoring waterbirds, managing data and equipment and logistics were not ranked highly as strengths, clearly monitoring is taking place across the flyway in Africa, albeit often with some restraints, whilst some improvements in data sharing and skills were noted. The only strength noted in relation to logistics was that some governments were able to secure transport to enable waterbird counts to be conducted.

## 5.3 Perceived future capacity needs for improved monitoring along the East Atlantic Flyway in Africa

Figure 18 illustrates perceived future capacity needs divided into eight categories, the largest of which (32% of responses) focused on the delivery of training. This category includes training in bird identification and counting, Training of Trainers (ToT) and 'learning-by-doing' largely through regular one to one fieldwork. Respondents also mentioned the need to build capacity of young people and protected areas personnel for work in the field, as well as strengthening the leadership skills of National Coordinators. Some respondents noted the need to invest training in the same people so that they would continue to learn, whilst others mentioned the need to train new people who could join the monitoring networks. It was also recommended to encourage national organisations to organise and deliver training, so that they were not reliant on international partners for this.

In addition, strengthening formal training was also recommended through universities and colleges and the development of longer technical courses, similar to those provided by the Tropical Biology Association (TBA). The upcoming MOOC in waterbird identification and counting was also included in this category. Building capacity for research was also recommended, including training in reading colour rings.

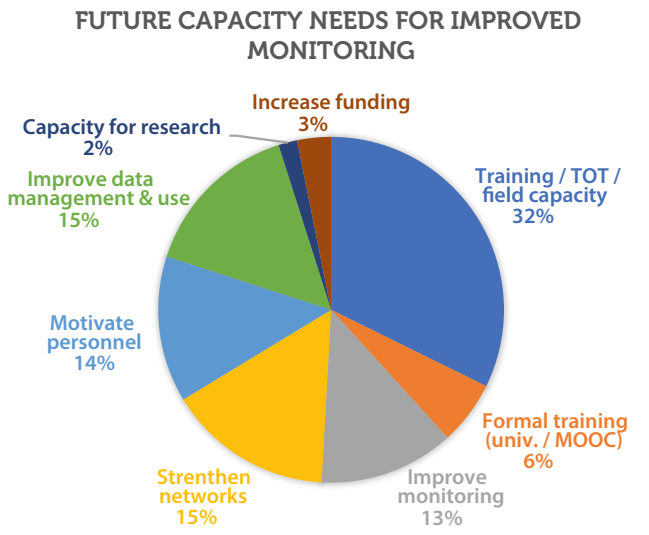


**Figure 18.** Perceived future capacity needs for improved monitoring along the East Atlantic Flyway in Africa

The category 'motivate personnel' was also focused on training, but was identified as a separate category as several respondents highlighted the need to train the 'right' people, especially those who

were motivated and showed a genuine interest in birds and would be enthusiastic participants in taking part in monitoring activities over the long term, including on a voluntary basis. Engaging people who were passionate about birds and conservation would lead to quick results and stronger networks.

The need to strengthen networks, ranked at 15% of responses, included increasing collaboration of coordination bodies with universities and NGOs, as well as with AEWA National Focal Points (NFPs). Within Africa exchange visits, e.g. between protected areas or key sites of the flyway were also recommended, as well as holding regional workshops for NCs, in order to promote exchange and deliver training. The need to strengthen national networks was identified, whilst a few respondents noted the need to employ ecoguards, e.g. at sites that were not formally protected.

The need to improve data management and use was also emphasised in 15% of responses, with a need in particular for training in and support for data management and analysis. The need for reliable data-sharing mechanisms was also highlighted, noting that problems in data sharing was a genuine hindrance to monitoring in a few countries. A strong vision for data use was needed, which would increase acceptance of the need for monitoring. Data verification measures also needed to be improved in some areas. In addition, awareness should be raised on the need to use monitoring results for reporting to international conventions, especially AEWA, CMS and Ramsar.

Recommended improvements in monitoring included initiating programmes of regular and standardised bird counts at key sites, i.e. going beyond the common picture whereby waterbird monitoring was only carried out once a year. This could include monthly counts, e.g. in a subset of counting units at larger sites, although this could be difficult to maintain for many sites for diverse reasons (availability of competent staff, finances etc.). In one country, a programme of monthly counts had been suspended because the data generated were not being used. It was also recommended to develop specific written monitoring protocols, especially for large complex sites. The importance of providing incentives for monitoring was noted, although it was cautioned that incentives should not revolve around per diems. The importance of international coordination was highlighted, which could keep help to keep track of monitoring programmes and provide pressure for improvements. The need for international support for monitoring was noted, including the participation of international experts. Overall, strong continuity in monitoring programmes was needed, which would translate to a continuity in building capacity for monitoring, as networks and people involved in monitoring would inevitably change over time.

Increasing funding for monitoring was only ranked at 3% of responses, although this no doubt would have increased were the focus of the exercise on fundraising instead of capacity building. The need for long-term sustainable funding arrangements was highlighted as being important for continuity, as most monitoring was currently supported through projects, some of which were rather short-term in nature. The development of trust funds with resources set aside for monitoring would be very welcome, as well as building monitoring into formal management procedures, such as protected area annual budgets. Further, governments are required to submit comprehensive reports to international conventions, and should direct or leverage financial support for monitoring, to help in meeting these reporting obligations.


Tim Dodman

**Fieldwork during a regional training workshop at Diawling, Mauritania.**

# 6. Building on the past: short conclusions, lessons learned and looking forward

## 6.1 Conclusions

1. The coastal Atlantic zone of Africa has numerous sites of importance for resident and migratory waterbirds, many of which have been designated as protected areas, with varying levels of site management and protection, usually led by government agencies.

2. The monitoring of non-breeding and breeding waterbirds at coastal wetlands has taken place quite widely since the 1990s along the East Atlantic Flyway in Africa, and the IWC and bird colony monitoring are recognised activities. However, they are not widely built into national budgets and are invariably dependent on external support and/or short-term projects.

3. Despite investments in capacity building for monitoring over a few decades along the East Atlantic Flyway in Africa, major gaps in capacity still exist at the site and national level, both in institutional and technical capacity.

4. Waterbird monitoring requires strong institutions, and tends to be most effective when government agencies, NGOs and academic institutes work together and share responsibilities and results.

5. National and site monitoring programmes should be valued locally, with results contributing first to site management and national awareness, and secondly to international analyses. Institutional and technical capacity is needed for use and analysis of data for a stronger uptake in management and policy decisions.

6. Effective monitoring relies on networks of skilled observers, usually comprising protected area agency personnel, ecoguards, NGO staff, students and volunteers. Motivated people, whose main incentives for monitoring are their enjoyment of field work and an interest in birds, are the more effective observers. Building incentives and engaging enthusiastic observers is key for success.

7. Waterbird monitoring needs to go hand in hand with a regular training programme, which should involve new/young observers, and include assessments of training needs, field training events and on-site support, as well as exchanges between sites, and building a network of effective trainers through ToTs.

8. Observers need to carry out regular monitoring or related field work to maintain and improve their field skills, and benefit from experiential learning. They should participate in relevant field work year-round, such as monitoring breeding birds, habitats and pressures, and take part in integrated research programmes.

9. Investments are needed to strengthen leadership, such as engaging trained ecologists in national networks, building support for improved coordination, and scientific training to enable the better use of data for management and reporting, as well as extending the remit of and capacity for environmental (site) monitoring.

10. As waterbird monitoring should take place at least every year, pathways to sustainability are vital. They will vary between sites and countries, but are likely to include building monitoring into annual work plans, validating its relevance and using results, creating incentives, partnerships and motivation at different levels, and innovative fundraising opportunities.

## 6.2 Lessons learned and looking forward

### 6.2.1 Regional initiatives and Funding

Regional initiatives have played an important role in strengthening networks and providing support for monitoring. The current cooperation between WSFI, Wetlands International and BirdLife International in supporting monitoring and capacity building along the flyway is very positive, and plays a key role in encouraging partners across the region to keep the IWC going. Integrated research programmes, such as those led by RUG, NIOZ and the University of Aveiro provide important opportunities for people to become actively engaged and professionally competent in waterbird research. International conventions can provide strong incentives for monitoring, although national partners often need to strengthen their commitments to meet obligations. Regional activities such as the AEWA ToTs bring home the relevance of the convention.

Financial capacity for waterbird monitoring is a widespread issue across the East Atlantic Flyway in Africa, with funds often preventing the execution of waterbird counts, purchase of equipment and adequate logistical resources. However, given that many migratory waterbirds are shared resources between Africa and Eurasia, there is a vested interest in many European countries to ensure that monitoring these shared resources continues. As both Africa and Eurasia benefit from the data collected, contributions of funds from a part of the flyway with more resources to another part with less resources are in some ways logical. However, there is a balance to make, as no doubt many organisations and protected area administrations in Africa prefer to 'stand on their own feet' and feel responsible and in control of their own programmes.

Much capacity building has also depended on external funding through a range of projects or research programmes.

**Lessons learned**

a. Regional projects and initiatives are essential in bringing countries together for monitoring especially migratory species.
b. Longer-lasting initiatives stand to prove more effective than short-term projects, with stronger partnerships developed and greater prospects for building on training, evolving and implementing lessons learned.
c. Building synergies and coordinating efforts between regional projects and initiatives contribute to long-term and advanced training opportunities.
d. Exchanges within Africa present opportunities for south-south cooperation along the flyway and should be promoted.
e. Building capacity for monitoring is a long-term need that requires fundraising at all levels.

### 6.2.2 Training in waterbird monitoring

Training in field skills such as bird identification and counting will always be needed and should be built into all waterbird monitoring programmes through a combination of longer training for new participants and shorter refresher training. This should be carried out within all participating countries, especially at key sites, with selection of suitable participants for training. Some refresher training should be delivered in advance of January counts, but additional sessions may well be needed, especially for sites or countries where little or no monitoring takes place outside of January counts. Training is needed in other aspects of monitoring, including planning and coordination and data management, and ToT events have a unique role in building sustainability of training. Training of Trainers (ToT) workshops can promote sustainability, but some events are mislabelled as ToTs.

**Lessons learned**

a. Probably the most successful / sustainable capacity building for monitoring in the field has been through **long-term regular investment in a limited number of key people**, who were or became personally enthusiastic for the work. As an example, a few, now older, key personnel in PNBA received in-field training and learning-by-doing during monitoring and research programmes over many years and throughout the year. Their colleagues and younger generations look up to them. There can however be issues of sustainability.
b. **One-off workshops** can be important to plan, launch or encourage monitoring, and serve a role in motivation. However, they are rarely unable to deliver in-depth training and result in lasting capacity for monitoring.
c. **Long-term programmes or initiatives**, such as those provided by TdV, WSFI or projects such as the Climate Resilient East Atlantic Flyway (CREAF) project and CMB, can deliver long-term capacity benefits, with sustainable results achieved over several years. Training is usually more successful when there are longer-term investments in key motivated people.
d. **Repeated focused partnership support** over a long time-frame tends to result in sustainable local teams, an example being the partnerships between WSFI / NLPV and DPWM in The Gambia, that has been active since 2015 and between RUG and the PNBA.
e. **Exchange programmes** have been limited, but seem to be highly valued when they do take place. There is great potential for exchange between people of different African countries, which can help to build regional networks.
f. **Training of Trainers (ToT)** workshops / events have an important role to play in capacity building. A ToT should contain significant elements of HOW to design, deliver and follow up capacity building events. Training a number of people in monitoring is not a ToT unless it builds capacity of trainees to be effective trainers. Participants should already have a good understanding and knowledge of monitoring.
g. **Selection of appropriate participants** is an important part of planning capacity building events, especially field monitoring. Sometimes office-based personnel, such as senior protected areas staff, are involved in regional or national events, even though they may not take part in any field monitoring.
h. **Equipment and training materials**, such as binoculars, field guides and potentially computers with software, are important elements to support capacity building events. These are often in limited supply during training events, and often not available at all after training.
i. **Conferences / workshops:** Build exchange on recent developments in waterbird / wetland monitoring into conferences / workshops; diversity participation and involve underrepresented countries or groups at such events.

### 6.2.3 Waterbird counts

Waterbird counts provide the perfect opportunity for building capacity in waterbird monitoring. Many recent total count efforts contain refresher workshops, evaluation meetings, checking identifications and assessing bird numbers while doing the counts. As good quality results need to be collected in a limited timeframe during the total counts, capacity building is best suited for observers who are already engaged and have a certain skill level; training opportunities for new observers are limited. The IWC counts also rely to a certain extent on regional coordination at an international level, especially for the 'total' counts that have been taking place since 2014 every few years.

The effective monitoring of large sites may be complex and time-consuming and require several days. Such counts need careful planning and coordination, good teamwork and communications, as well as cognisance of environmental factors, such as tides and weather, and other issues, such as logistics, security and safety.

Waterbird count coordinators have an important role to play in monitoring, and good coordination is needed at the site and national level for successful waterbird monitoring programmes. Coordination is less effective in some countries than others. Budgeting for monitoring is also important, and capacity is needed in devising realistic budgets and developing as effective a monitoring programme as possible with often limited funding.

**Lessons learned**

a. The January total counts offer high potential for building capacity through direct involvement of local IWC teams, especially when there are planning and evaluation meetings and good teamwork.
b. There is high potential for local counters with some experience to work closely with or 'shadow' experienced counters and learn

from them. Whilst performing counts presents limited opportunities for training, especially at complex sites, time can be set aside for sharing techniques and tips etc.

c. Local counters with some experience can self-improve by gradually taking on some levels of responsibility, but checks and reporting back are important.
d. The total counts in themselves should not be seen as standalone capacity building events, but can significantly contribute to building capacity for monitoring. They offer a key opportunity to build capacity in the different stages of monitoring, from planning (including budgeting) and logistics to data entry and management, which are all essential elements.

### 6.2.4 Learning by doing / Experiential learning and practical skills

The value of learning through practical experience cannot be underestimated, and participants in monitoring programmes should not be expected to retain or maintain field skills if they are only involved once a year or less in IWC counts. Learning by doing and familiarisation of practical skills tends to need repetition for it to be effective. Much waterbird monitoring revolves around the January IWC counts, for which there is quite widespread enthusiasm in a number of countries. However, many IWC participants do not carry out other bird monitoring activities for the rest of the year, so whilst they may learn during their participation, they will also forget much of what they learned by the next January count.

Thus, activities such as monthly or at least more regular counts play a vital role in maintaining field skills, as well as building interest and motivation. The opportunities of learning by doing increase through integrated monitoring and research programmes, in which fieldwork takes place throughout the year or over a longer time period during a season. Some field staff at key sites such as the PNBA have been involved in regular fieldwork throughout the year or every migratory bird season, and have become local experts in monitoring waterbirds mainly through learning by doing. It is vital to maintain such mechanisms and to ensure that a cadre of fieldworkers at key sites are involved in research and/or regular monitoring, and keep learning and improving their skills. To ensure sustainability, younger or new fieldworkers need to be involved, rather than only older more experienced staff, while it is also important that staff turnover is relatively low.

**Lessons learned**

a. Regular relevant field activities focused on waterbirds that engage local, especially site-based personnel, present strong opportunities for learning through practical experience.
b. There needs to be a cadre of fieldworkers involved in regular fieldwork at key sites, including younger, less experienced staff.
c. There are good opportunities for students to become involved.

### 6.2.5 Academic training, research and integrated monitoring

If the whole process of waterbird monitoring from the selection of sites, devising count units and coordinating surveys to the collation and analysis of results is to be effective and dynamic, and led by national / local teams, then it invariably needs a skilled local leader at the helm, who has good academic and field experience. In order to understand the long-term climate related ecosystem changes, long-term monitoring is required along the flyway, which itself requires dedicated observers, excellent field methodology and data management, and continuous feedback between field workers and scientific analysts (T. Piersma, *in litt.*).

Research programmes can provide more opportunities for intensive training than single monitoring activities, and can contribute to building local capacity in learning practical field techniques, understanding processes and planning, and in data management and analysis, all aspects important for successful monitoring.

There is a need for regular systematic integrated monitoring, including colour ringing, tracking and breeding bird studies. Environmental monitoring of wetlands is vital for analysing pressures, and has been improving in the 2000s, especially during 'total IWC counts', but can be improved through innovations (Reneerkens *et al.* 2024). Setting up, managing and analysing integrated and environmental monitoring at the national level requires local academic leadership.

**Lessons learned**

a. Research programmes can significantly contribute to building local capacity in learning practical field techniques, understanding processes and planning, and in data management and analysis, all aspects important for successful monitoring.
b. Research programmes that build in opportunities for local, site-based personnel to be engaged in the research offer important long-term benefits.
c. Protected area administrations need to designate enthusiastic personnel to research programmes, and encourage them to remain involved.
d. Integrated monitoring of waterbirds is an important development, but capacity for this is lacking along the East Atlantic Flyway in Africa.
e. Building standardised environmental monitoring into IWC counts provides valuable insights, but more quantification and involvement of local knowledge are needed.

### 6.2.6 Strengthen networks, and build motivation & incentives

Networks of people form the backbone of waterbird monitoring. Various projects and initiatives have provided support to networks, yet the need for continued support in one form or another invariably remains. This is not necessarily because past projects or initiatives failed, but because monitoring, by its very definition, should be continuous and lasting, yet networks, techniques and priorities change, whilst people move on. Successful networks may vary widely, often including volunteers and students, but they usually need committed coordination. Thus, a strong national waterbird monitoring network may well reflect a committed and enthusiastic NC or NGO promoting the work. Developing, maintaining and leading networks is a capacity need, to enable NCs to be able to confidently make regular

communications, organise planning meetings and other events including training, provide feedback and share results.

Engaging people in monitoring birds who are interested and keen to do it is much easier and more effective than involving people who just see it as part of their job and/or who have no interest in it. Positive incentives that favour the motivated are more sustainable than unconstructive ones, such as per diems. Per diems have their place, especially when people have to work long hours or away from their station, but they should not become a necessary requirement. Counting waterbirds in a team can be an enjoyable activity, building networks and providing new opportunities. Encouraging motivated people through increased responsibilities can provide incentives to keep them involved. There is also a need to motivate local communities and young people to become interested and engaged in wetlands, including through wetland centres. At a flyway level, this can be achieved through networks like Migratory Birds for People (MBP).

**Lessons learned**

a. Build capacity of NCs, to enable them to effectively lead monitoring programmes.
b. Build incentives of motivated people through increased responsibilities, such as organising a bird count at a local wetland or training someone less skilled.
c. Encourage local communities to take part in monitoring through events and other activities.

### 6.2.7 Data management and use

Managing and using data derived from waterbird counts or other monitoring data are essential parts of a successful monitoring programme. IWC data are usually submitted to Wetlands International by NCs or by site organisers. However, data are often not used or managed at the site and/or national level, or not effectively so. This can lead to monitoring programmes being undervalued and even stopped. Not using the results also takes away their main purpose and benefit, i.e. to actively contribute to managing waterbird populations and the sites on which they depend. There is also scope for using results to highlight conservation issues and guide local awareness campaigns.

**Lessons learned**

a. It has been commonplace to collect data that is later not used.
b. There has been an over-reliance on external organisations to analyse data.
c. Capacity is needed in all countries and at key sites to manage their own data, to analyse data and to use results to influence site / species management.

### 6.2.8 Equipment, field guides and manuals

Despite some provision of optics, other equipment and field guides, there remains a shortage in supply. Decent binoculars in good condition are particularly important. Field guides also play an important role in helping fieldworkers to identify birds or other biodiversity. Newer equipment is also needed both to facilitate improved research and monitoring, and also to maintain enthusiasm. Drones in particular are playing a growing role in monitoring breeding bird colonies.

**Lessons learned**

a. The provision of good optics is essential for monitoring programmes.
b. Invariably, the best use of binoculars is when people own them or have personal responsibility for them. This encourages their use throughout the year and their proper maintenance.
c. Guidance is needed in the care for and proper use of optics.
d. Field guides need to be freely available for monitoring teams. This demand will not diminish as teams invariably change over time.
e. There is great potential for digital field guides and other resources. Key field guides should be available for use on mobile phones.
f. New technologies, such as drones, provide important benefits for monitoring, and efforts are needed to increase capacity in adopting and using new tools.

### 6.2.9 Feedback and reporting, Monitoring and Evaluation (M&E)

Providing feedback to everyone involved in monitoring is important, and enables them to realise the objectives, see the results, and learn from any analyses or conclusions. NC and others involved should have good communication and reporting skills. There are many opportunities for publicising results of waterbird counts or about the counts themselves, especially through social media and websites. It is quite common for environmental organisations to publicise the participation of their senior staff in international conferences etc, but often reports of teams in the field are missing.

As with all programmes, it is important to monitor and evaluate the effectiveness of waterbird monitoring on a regular basis and look for ways to improve. This needs to be done at all levels. M&E can be done through meetings, workshops, evaluation missions or through communications, such as targeted interview assessments against meeting objectives and fulfilling actions. M&E should be a positive process, and does not need to be formal. It should engage all stakeholders and be seen as a learning and forward-looking process.

**Lessons learned**

a. Providing feedback from waterbird counts is essential at all levels, both for enabling results to be used and understood, and for motivating networks.
b. The recent evaluation workshops in PNBA and the Bijagós and the meetings in Saloum have demonstrated that evaluating monitoring programmes can produce useful results and highlight priorities for improvement.
c. Post-monitoring evaluations should become standard procedure for IWC counts.
d. More in-depth periodical evaluations, carried out in the form of a SWOT analysis or similar, present an opportunity to critically review monitoring programmes, identify priorities for improvement and make plans to address them.


**Waterbird monitoring team at Mussulo Lagoon, Angola**

# 7. Strategic framework to build capacity for waterbird monitoring along the East Atlantic Flyway in Africa

Building on results and conclusions of the assessment, this section presents a strategic framework to build capacity for waterbird monitoring along the East Atlantic Flyway in Africa (Table 5). This framework is intended to guide organisations and administrations in terms of actions that could be undertaken to build and improve institutional and personal capacity and wider awareness in relation to waterbird monitoring. Different organisations will already be implementing a varying number of the proposed actions, so the framework does not specify a specific formula for one and all. Rather, it attempts to outline a series of actions for organisations to consider adopting in order to build capacity for monitoring. It is hoped that adopting a suite of actions would improve the sustainability, development and support for long-term monitoring programmes along the East Atlantic Flyway in Africa.

The framework is preceded by a Results Chain to illustrate the role of capacity building in contributing to effective monitoring and in ultimately improving waterbird conservation (Table 19).

The framework does not specify which organisation(s) or administration(s) should implement different actions, as this will depend on the local context, but it does differentiate between actions proposed to be led at a national or site level and at a regional or international level. Inevitably, there will be cross-over between these. The framework includes the following elements:

- **Timeframe:** The framework does not specify a timeframe in terms of specific years when actions should be carried out, but identifies whether actions are expected to take place on a rolling place, at certain times of the year or at proposed intervals.
- **Priority:** Priority rankings are proposed, but these undoubtedly vary between countries and sites.
- **Budget:** The framework also proposes a very approximate budget range for each action, which does not represent a specific budget, but an approximate guidance of costs. Budget estimates at the international / regional level are generally per event, whilst estimates at the national and/or site level are the cost of each action per country or site.


Paulo Catry

**Identifying terns during a training workshop in Guinea-Bissau.**

**Key to Table 5**

*Budget estimates at the national and/or site level are per country or site*

| Symbol | Description |
|---|---|
| * | Low |
| ** | Medium |
| *** | High |
| R | Regular internal cost, e.g. staff time |

| Symbol | Approximate cost |
|---|---|
| € | < €1,000 |
| €€ | €1,000 - €10,000 |
| €€€ | €10,000 - €50,000 |
| €€€€ | €50,000 - €100,000 |
| €€€€€ | > €100,000 |

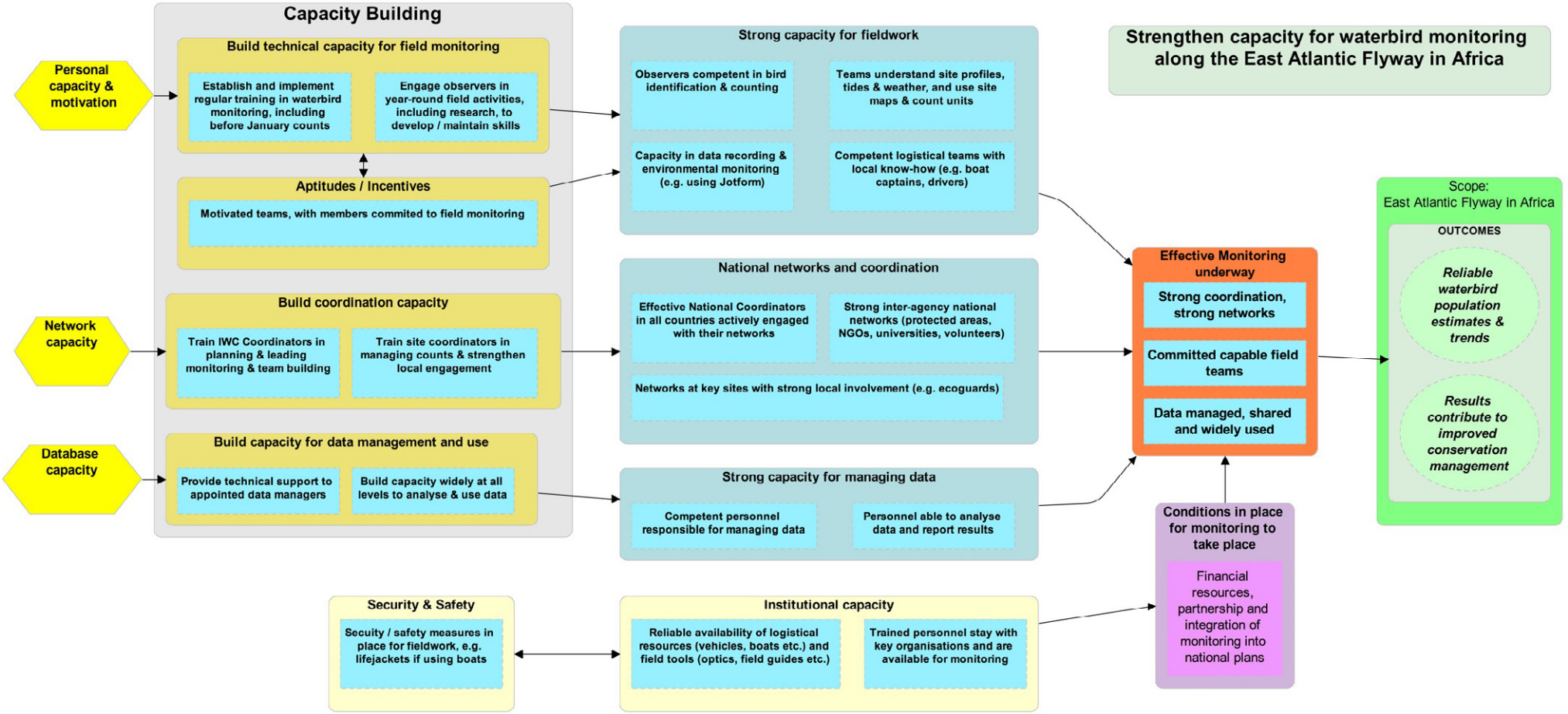


**Figure 19.** Results Chain illustrating the role of capacity building in contributing to effective monitoring and its outcomes along the East Atlantic Flyway in Africa

This Results Chain illustrates the role of capacity building in contributing to effective monitoring and in ultimately improving waterbird conservation. The diagram does not attempt to catch all the elements important for sustainable monitoring, but focuses on capacity. The flyway level outcomes are only achievable when results from key sites and countries along the flyway are reliable, which depend in turn on strong local and national capacity.

**Table 5.** Strategic framework to build capacity for waterbird monitoring along the East Atlantic Flyway in Africa

| Capacity focus | Action: National and/or site level (blue) International / regional level (green) | Timeframe | Priority | Budget |
|---|---|---|---|---|
| **A. Build technical capacity for monitoring** | | | | |
| **Training in waterbird monitoring** | 1. Establish systematic **national training programmes** for waterbird monitoring, and maintain an inventory of trained counters and training needs | Initial step | *** | €€ - €€€ |
| | 2. Develop and implement a programme of **beginner and refresher training** in bird monitoring and counting, especially in preparation for annual January counts | every Dec / Jan | *** | R |
| | 3. Train counting teams in **survey and observer protocols for key sites**, including in mapping, the use of GIS and familiarisation of counting units for larger sites | on rolling basis | ** | R |
| | 4. Provide regular **'learning by doing' practical experience** for enthusiastic field personnel, especially younger persons and students, who accompany more experienced personnel | on rolling basis | *** | R |
| | 5. **Integrate training opportunities into January IWC counts**, especially the 'total counts' in collaboration with international partners | annually | *** | R |
| | 6. Provide **training in environmental monitoring**, including the use of Jotform | annually | ** | R |
| | a. **Build synergies and coordinate efforts** between regional projects and initiatives to contribute to advanced training opportunities | on rolling basis | *** | R |
| | b. Organise a **series of ToT workshops** to train skilled people to develop and plan training workshops and in training techniques; trainees should gain certification, be recognised as trainers, and be available for delivering future training | 1 ToT every 3 years | ** | €€€€ |
| | c. Prepare a **monitoring training kit** for use by trainers along the flyway | once | ** | €€€ |
| | d. **Assess priorities for training needs** in data collection and analysis along the EAF | every 3 years | ** | € |
| | e. Organise **regional training courses** in data collection and in **new technologies**, building on the *Innovations for migratory bird monitoring along the East Atlantic Flyway* project roadmap | on rolling basis | *** | €€€ - €€€€ |
| | f. **Develop long-term partnerships** between specific European and African wetland units, and enhance training through joint monitoring programmes in Africa | on rolling basis | ** | €€€ |
| **Improve monitoring coordination and logistics** | 1. NCs to organise **IWC coordination meetings** before January counts, to determine teams, to agree and map count units, and to assign responsibilities | every January | *** | € |
| | 2. **Build capacity of count organisers** at key sites to plan and budget for counts, to set the number of trained counters required, to implement and follow up counts, and to manage and motivate a team | on rolling basis | ** | €€€ |
| | 3. Protected area administrations to **assign staff responsible for waterbird counts** | on rolling basis | ** | R |
| | 4. National governments or NGOs to **build the role of NC into a staffed position**, with clear Terms of Reference, and provide resources for carrying out this role | on rolling basis | ** | €€ |
| | 5. Organise training in **planning and coordination** of counts through national and regional workshops for key site coordinators and/or through exchange | annually | *** | R |
| | a. Provide **technical support to NCs and site count organisers** to establish / review monitoring protocols, including count site units, especially for complex sites | every 3 years | *** | €€€€ |
| | b. Develop and/or promote a **suitable App or Apps for monitoring** (available in different languages, offline access) and data reporting, and provide support | initiate; then on rolling basis | ** | €€ |
| | c. Improve NC and national network **coordination skills** through practical guidance and exchange | on rolling basis | ** | €€ |

| Capacity focus | Action: National and/or site level (blue) International / regional level (green) | Timeframe | Priority | Budget |
|---|---|---|---|---|
| Academic training, research and integrated monitoring | 1. Encourage the development of **ornithological studies in universities** in Africa | on rolling basis | *** | R |
| | 2. **Promote collaborations** between protected area administrations and research institutes/ agencies and universities | on rolling basis | *** | R |
| | 3. **Develop opportunities/ internships** for students to conduct / participate in ornithological fieldwork focused on waterbirds | on rolling basis | *** | R |
| | 4. Build opportunities to **engage local/ site-based personnel in research** programmes, and plan learning programmes for them, including using new skills | on rolling basis | *** | R |
| | 5. Protected area administrations to **designate personnel to research programmes**, especially those who are motivated, and encourage them to remain involved | on rolling basis | ** | R |
| | a. Integrate support for **MSc/PhD students** focused on waterbirds and coastal wetlands into flyway level conservation projects | on rolling basis | ** | €€€€ |
| | b. Support and guide national institutes and students to **analyse monitoring data**, including the drivers of trends for waterbird populations | on rolling basis | ** | €€€€ |
| | c. Build synergies between international NGOs and research institutes to develop and implement a **regional training programme in integrated monitoring** of waterbirds, including in reading and reporting colour rings | every 3 years | *** | €€ |
| **B. Aptitudes / incentives** | | | | |
| Build motivation and incentives | 1. **Invest in motivated people** as far as possible within organisational or other limitations | on rolling basis | *** | R |
| | 2. National and local NGOs to **support development of wildlife/ bird clubs**, and organise bird watching field trips to local wetlands, to boost youth interest | on rolling basis | ** | €€ |
| | 3. Promote **engagement of local communities** in waterbird monitoring and build their interest and capacity through training linked to WMBD and other events | on rolling basis | ** | €€ |
| | 4. **Build incentives for participation** in monitoring through public recognition in social media, rewards (e.g. T-shirts, certificates) and links to work opportunities | on rolling basis | ** | € |
| | a. Strengthen the role of **wetland centres** and CEPA programmes in monitoring, including promoting local involvement and displaying/ informing results | on rolling basis | ** | €€€ |
| **C. Build coordination capacity** | | | | |
| Strengthen networks | 1. NCs to establish/ maintain a **national waterbird monitoring network**, with regular meetings/ events, communications, feedback, sharing results, and delivering training | on rolling basis | *** | €€ |
| | 2. Government administrations to **reduce staff turnover** and retain key personnel, or ensure adequate time for handover if they move on | on rolling basis | ** | R |
| | 3. Government administrations to **build responsibilities of trained counters** through their active engagement in planning and management | on rolling basis | ** | R |
| | a. **Build capacity of NCs and national IWC networks** through regional workshops and 1:1 support to create and maintain a network of counters and data managers | every 3 years | ** | €€€€ |
| | b. Organise and implement a **flyway level exchange programme** to enable African ornithologists to visit and exchange ideas with sites / ornithologists in Europe | every 3 years | ** | €€€€ |
| | c. Develop/ support a **regional exchange programme** between African wetlands to strengthen the regional network and to enable learning between sites, including through regional online events | on rolling basis | *** | €€€ |
| | d. Build capacity of MEA NFPs to incorporate monitoring results into **MEA reporting** | on rolling basis | * | €€€ |
| Feedback and reporting | 1. Build **communication skills** within monitoring networks and awareness of waterbird monitoring programmes within communications teams | on rolling basis | * | € |
| | 2. NCs/ site coordinators to organise **national workshops and/or local meetings** to present IWC and other monitoring results | on rolling basis | *** | € |
| | 3. Develop **functional site websites**, and update information about monitoring | on rolling basis | ** | €€ |
| | a. Provide NCs, site coordinators and others with **guidance on report writing** and providing feedback to their networks | on rolling basis | ** | €€ |

| Capacity focus | Action: National and/or site level (blue) International / regional level (green) | Timeframe | Priority | Budget |
|---|---|---|---|---|
| Monitoring and Evaluation (M&E) | 1. Organise **training in M&E** where capacity for this is lacking | on rolling basis | * | € |
| | 2. **Put in place M&E procedures** to evaluate the effectiveness of networks and individuals engaged in monitoring, such as NCs, site coordinators and others | on rolling basis | ** | € |
| | a. Develop a set of **M&E recommendations** for implementing the IWC and other waterbird monitoring activities along the EAF in Africa | on rolling basis | * | € |
| **D. Build capacity for data management and use** | | | | |
| Data management and use | 1. Establish **national IWC/ waterbird databases** within a competent and responsible organisation, with assigned trained database manager | on rolling basis | *** | €€€ |
| | 2. Ensure that **data is shared between organisations** and readily accessible to site managers, university students, AEWA NFPs and others | on rolling basis | ** | R |
| | 3. **Encourage data use at different levels**, including for site management and national planning, and build incentives through training or creating responsibilities | on rolling basis | ** | R |
| | 4. Create **key site databases**, especially protected areas, and build local capacity for shared use of data, and feedback loops for data verification | every year | ** | €€€ |
| | 5. Provide training for data managers in **statistics for data analysis** | every year | ** | €€€ |
| | 6. Through **active exchange of teams**, encourage field teams to contribute to databases and learn about data use, and data managers to better understand data collection methods; also, provide continuous **two-way feedback** of results, data and analyses | every year | ** | €€ |
| | a. Through workshops with dedicated follow-up, **support partners to develop national/ site databases** based on user-friendly platforms, and to use data for **waterbird population analyses and contributing to site management** | every 3 years | *** | €€€€ |
| **E. Institutional capacity** | | | | |
| Equipment, field guides and manuals and related training | 1. Protected area administrations and NGOs to **source optics, equipment and field guides** for staff and stakeholders (e.g. ecoguards) for use in waterbird monitoring | on rolling basis | *** | €€ |
| | 2. Provide guidance and **training in the care, maintenance and use of equipment** | on rolling basis | ** | R |
| | 3. Protected area administrations to ensure that **logistical resources**, e.g. vehicles, boats, optical equipment, are available for key events, such as IWC counts | on rolling basis | *** | €€ |
| | 4. Protected area authorities to provide **safety and communications equipment** (e.g. life jackets, first aid kits) and ensure its availability for monitoring and appropriate use | on rolling basis | *** | €€ |
| | 5. Provide **field safety training**, including swimming, first aid and site familiarisation | on rolling basis | ** | €€ |
| | 6. Provide or make **drones available for monitoring** breeding colonies of waterbirds, and organise training in their use, including protocols and their practical safe use to minimises disturbance, and in interpretation of data and photography | on rolling basis | ** | €€€ |
| | a. Provide quality durable **optics and field guides** for monitoring, including for committed participants, protected area administrations, NGOs and universities | on rolling basis | *** | €€€ |
| | b. Develop **digital field guides / apps** to facilitate waterbird monitoring and organise training or guidance in their use, including on Smart phones | on rolling basis | ** | €€ |
| | c. **Disseminate** the *Waterbird and site monitoring along the Atlantic coast of Africa: strategy and manual*, especially to new observers, and create a digital version | on rolling basis | * | R |
| **F. Conditions in place for monitoring to take place** | | | | |
| Funding | 1. National governments/ protected area administrations to **build waterbird monitoring and training into annual budgeted work programmes** and site management plans | on rolling basis | *** | R |
| | 2. National governments, protected area administrations and environmental NGOs to **fundraise for monitoring programmes** | on rolling basis | ** | R |
| | a. **Fundraise** to build institutional capacity for planning, managing and coordinating monitoring programmes and data analysis, and for building it into other sectors | on rolling basis | ** | €€ |

# 8. Acronyms

| | |
|---|---|
| **AAO** | Association les Amis des Oiseaux, Tunisia |
| **A&W** | Altenburg & Wymenga ecological research |
| **ADAMA** | Associação dos Defensores e Amigos do Ambiente, Angola |
| **AEWA** | Agreement on the Conservation of African-Eurasian Migratory Waterbirds |
| **AfWC** | African Waterbird Census |
| **AMBI** | Arctic Migratory Birds Initiative |
| **APLORI** | A. P. Leventis Ornithological Research Institute, Nigeria |
| **BirdEyes** | Centre for Global Ecological Change, University of Groningen, The Netherlands |
| **BirdLife** | BirdLife International |
| **BirdLife EAFI** | BirdLife East Atlantic Flyway Initiative |
| **CAFF** | The Conservation of Arctic Flora and Fauna (a Working Group of the Arctic Council) |
| **CBCR** | Centre for Biodiversity Conservation and Research, Ghana (formerly the Centre for African Wetlands) |
| **CCMAR** | Algarve Centre of Marine Sciences, Portugal |
| **CEPA** | Communication, Education and Public Awareness |
| **CIOMA** | Centro de Informação, Observação e Monitorização de Aves, Angola |
| **CMB** | 'Conservation of Migratory Birds' project |
| **COC** | Cameroon Ornithological Club |
| **CSE** | Centre de Suivi Écologique, Senegal |
| **CSN** | Critical Sites Network |
| **CSSL** | Conservation Society of Sierra Leone |
| **CWCS** | Cameroon Wildlife and Conservation Society |
| **CWSS** | Common Wadden Sea Secretariat |
| **DAMPC** | Direction des Aires Marines Communautaires Protégées, Senegal |
| **DGFF** | Direcção-Geral de Florestas e Fauna da Guiné-Bissau |
| **DPNS** | Direction des Parcs Nationaux, Senegal |
| **DPWM** | Department of Parks and Wildlife Management, The Gambia |
| **EAF** | East Atlantic Flyway |
| **FAO** | Food and Agriculture Organisation |
| **FBC** | Fourah Bay College, Sierra Leone |
| **FIBA** | Fondation International pour le Banc d'Arguin |
| **GPC** | Gabinete de Planificação Costeira, Guinea-Bissau |
| **GWS** | Ghana Wildlife Society |
| **IBA** | Important Bird and Biodiversity Area |
| **IBAP** | Instituto da Biodiversidade e das Áreas Protegidas, Guinea-Bissau |
| **INBAC** | Instituto Nacional da Biodiversidade e Áreas de Conservação, Angola |
| **IRD** | Institut de recherche pour le développement, France |
| **ISECMAR** | Instituto de Engenharias e Ciências do Mar (ISECMAR) / Institute of Engineering and Marine Sciences |
| **IWC** | International Waterbird Census |
| **IWRB** | International Waterfowl and Wetlands Research Bureau |
| **KBA** | Key Biodiversity Area |
| **LPO** | Ligue pour la Protection des Oiseaux, France |
| **MBP** | Migratory Birds for People |
| **M&E** | Monitoring and Evaluation |
| **MEA** | Multilateral Environmental Agreement |
| **MOOC** | Massive Open Online Course |
| **MPA** | Marine Protected Area |
| **NACOMA** | Namibian Coast Conservation and Management project |
| **NACToG** | National Association of Certified Tourist Guides, Sierra Leone |
| **NC** | National Coordinator |
| **NCD** | Nature-Communautés-Développement, Senegal |
| **NCF** | Nigerian Conservation Foundation |
| **NFP** | National Focal Point |
| **NIOZ** | Royal Netherlands Institute for Sea Research |
| **NLPV** | Nationalparkverwaltung Niedersächsisches Wattenmeer, Germany |
| **OBC** | Omulamba Biota Conservation, Angola |
| **OCPE** | Observatoire Congolais pour la Protection de l'Environnement |
| **ODZH** | Organização para a Defesa e Desenvolvimento das Zonas Húmidas, Guinea-Bissau |
| **OFB** | L'Office français de la biodiversité (previously ONCFS, and earlier ONC) |
| **OMPO** | European Institute for the Management of Wild Birds and their Habitats |
| **ORSTOM** | Office de la recherche scientifique et technique outre-mer, France (which became IRD) |
| **PAOC** | Pan African Ornithological Congress |
| **PAZHOC** | Plan d'Action pour la Conservation des Zones Humides et Oiseaux Côtiers |
| **PIN** | Programme of International Management of The Netherlands |
| **PNBA** | Parc National du Banc d'Arguin, Mauritania |
| **PND** | Parc National de Diawling, Mauritania |
| **PNOD** | Parc National des Oiseaux du Djoudj, Senegal |
| **PNDS** | Parc National du Delta du Saloum, Senegal |
| **PNLB** | Parc National de la Langue de Barbarie, Senegal |
| **PRCM** | Partenariat Régional pour la Conservation de la zone Côtière et Marine en Afrique de l'Ouest |
| **RNU-GNP** | Réserve Naturelle Urbaine de la Grande Niaye de Pikine, Senegal |
| **ROK** | Reserve Ornithologique de Kalissaye, Senegal |
| **RSPB** | Royal Society for the Protection of Birds, UK |
| **RUG** | University of Groningen, The Netherlands |
| **SAPAD** | Structure d'Appui pour l'Aménagement et le Développement du Delta du Saloum |
| **SCNL** | Society for the Conservation of Nature of Liberia |
| **SLNGA** | Sierra Leone Nature Guide Association |
| **SWOT** | Strengths, Weaknesses, Opportunities, Threats |
| **TBA** | Tropical Biology Association |
| **ToT** | Training of Trainers |
| **TSU** | Technical Support Unit |
| **TdV** | La Tour du Valat, institut de recherche pour la conservation des zones humides méditerranéennes |
| **UCAD** | University of Cheikh Anta Diop, Dakar, Senegal |

| | |
|---|---|
| **UGB** | University of Gaston Berger, Saint Louis, Senegal |
| **Uni-CV** | University of Cabo Verde |
| **UTA** | Universidade Técnica do Atlântico / Atlantic Technical University, Cabo Verde |
| **VBN** | Vogelbescherming, The Netherlands |
| **WI** | Wetlands International |
| **WIWO** | Working Group International Waterbird and Wetland Research |
| **WMBD** | World Migratory Bird Day |
| **WOW** | Wings Over Wetlands UNEP-GEF African-Eurasian Flyways Project |
| **WSFI** | Wadden Sea Flyway Initiative |
| **WWT** | Wildfowl and Wetlands Trust |

# 9. Definitions / Glossary

**Capacity building:**
The process of enhancing the skills, knowledge, systems, and infrastructure of individuals and organisations to improve their ability to perform tasks and achieve specific goals.

**Colony (of birds):**
A place where a number of birds of the same or mixed species breed gregariously, including the grouping of nests and breeding birds (and their eggs/young).

**East Atlantic Flyway:**
A recognised route used by birds, connecting breeding areas with staging and non-breeding sites on their annual cycle, stretching from the Arctic Circle (Northwestern Canada to Central Siberia) through Western Europe (mainly Atlantic and North Sea areas) to the entire western coastline of Africa.

**Flyway:**
The entire range of a migratory bird species (or groups of related species or distinct populations of a single species) through which it moves on an annual basis from the breeding grounds to non-breeding areas, including intermediate resting and feeding places as well as the area within which the birds migrate (Boere & Stroud 2006).

**Integrated monitoring of waterbirds:**
The monitoring of parameters which describe change in the distribution, abundance and composition (usually age and sex) of a waterbird population.

**International Waterbird Census (IWC):**
A global monitoring programme consisting of an annual synchronised count of all waterbird species.

**Monitoring:**
The repeated collection of information over time, in order to detect changes in one or more variables.

**Research:**
The systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions. / The diligent systematic enquiry into nature and society to validate and refine existing knowledge and to generate new knowledge.

**Stakeholder:**
Any person or local, regional or national organisation, including any governmental organisation or NGO, with an interest in the issue under discussion.

**SWOT Analysis:**
Strengths, Weaknesses, Opportunities and Threats; a way to analyse various aspects of a strategic planning process.

**Waterbirds:**
All species of the families Gaviidae, Podicipedidae, Pelecanidae, Phalacrocoracidae, Anhingidae, Ardeidae, Balaenicipitidae, Scopidae, Ciconiidae, Threskiornithidae, Phoenicopteridae, Anhimidae, Anatidae, Pedionomidae, Gruidae, Aramidae, Rallidae, Heliornithidae, Eurypygidae, Jacanidae, Rostratulidae, Dromadidae, Haematopodidae, Ibidorhynchidae, Recurvirostridae, Burhinidae, Glareolidae, Charadriidae, Scolopacidae, Thinocoridae, Laridae, Sternidae and Rynchopidae.

# 10. International partners in capacity building for waterbird monitoring

**The Wadden Sea Flyway Initiative (WSFI)**

The Wadden Sea Flyway Initiative (WSFI) was established in 2012, when the governments of Denmark, Germany and the Netherlands recognized their specific responsibility to contribute to conserving migratory waterbirds along the entire coastal EAF after the inscription of the Wadden Sea as a World Heritage Site. The WSFI Strategic Framework 2022-2029 sets out actions to contribute to realising the WSFI vision that "*migratory birds find lasting refuge along the East Atlantic Flyway from northern breeding areas to their key Wadden Sea stopover and to the African coastline, and inspire and connect people for future generations*". These actions broadly align with the two pillars of the WSFI, focused on monitoring and management, both with strong capacity building aims.

**BirdLife International**

BirdLife is a global family of 123 national Partners covering all continents, landscapes and seascapes, whose mission is to conserve birds, their habitats and global biodiversity, working with people toward sustainability in the use of natural resources. The BirdLife partnership established the East Atlantic Flyway Initiative (EAFI) to facilitate the monitoring of birds and sites, identify conservation priorities, and increase conservation capacity along the flyway.

**Wetlands International**

Wetlands International is dedicated to protecting and restoring wetlands for their environmental value as well as for the services they provide to people. Wetlands International also coordinates the International Waterbird Census, and provides support in the region from its office in Dakar.

**BirdEyes, the Centre for Global Ecological Change, University of Groningen**

BirdEyes is a science and creative centre that views the world through the eyes of birds, working in collaboration with others, including NIOZ. BirdEyes supports PhD students and post-doctoral researchers, and links ecological research with societal issues influencing ecological problems.

**African-Eurasian Migratory Waterbird Agreement (AEWA)**

AEWA is an intergovernmental treaty dedicated to the conservation of migratory waterbirds and their habitats. It brings together countries and the conservation community for coordinated conservation and management of migratory waterbirds throughout their migratory range. The AEWA Africa Initiative promotes implementation of AEWA in Africa, guided by the AEWA Plan of Action for Africa.

**Partenariat Régional pour la Conservation de la Zone Côtière et Marine en Afrique de l'Ouest**

PRCM is a coalition of actors working on coastal issues of West Africa from Mauritania to Sierra Leone, with activities coordinated from its office in Dakar. PRCM has a number of projects along West Africa's coastline, and organises the Regional Coastal and Marine Forum.

**Migratory Birds for People (MBP), an initiative of the Wildfowl and Wetlands Trust (WWT)**

MBP connects about 30 wetland visitor centres across Europe and West Africa in a network that follows the flight paths of migratory wetland birds. These centres work together to share best practice and develop new approaches to delivering wetland messages to their visitors.

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**Recording data in the field during a regional workshop, Mussulo Lagoon, Angola.**

# Annex 1. Detailed record of training events / workshops that included monitoring or the IWC which have taken place along the East Atlantic Flyway in Africa between the 1990s and 2025

| Year | Country | Site(s) | Capacity building activities | Lead(s) / Trainer(s) |
|---|---|---|---|---|
| 1990s -2025 | Senegal | Djoudj | Establishment of long-term IWC counts with mixed French-Senegalese teams. Elements of capacity building included every year. | DPNS with input over years of OMPO, ORSTOM & others |
| 1990s -2025 | Ghana | Coastal wetlands | Long-term monitoring of coastal lagoons, with in-field training usually taking place. | University of Ghana, CBCR, GWS, others |
| 1995-1997 | Guinea-Bissau | Bolama-Bijagós, Cufada | 'Waterbirds in Guinea-Bissau' partnership. This included a 3-month training course in monitoring (field planning, surveys and data entry), plus annual and monthly point counts at a number of sites. It also led to the launch of the NGO ODZH. | Trilateral Wadden Sea Cooperation (Sten Asbirk) |
| 1996 | Senegal | Djoudj | AfWC Review & Development Workshop: 31 participants, including from 7 EAF Africa countries. The workshop addressed a wide range of issues relating to initiating counts across Africa and addressed many capacity issues. It resulted in the first AfWC strategy. | WI (Tim Dodman, Abdoulaye Ndiaye, Paul Rose), with input from FAO, OFB, ORSTOM & WIWO. |
| 1997 | Senegal | Sine-Saloum & Petit Côte | The first 'complete' waterbird survey of Sine-Saloum included goals to transfer monitoring methodology. | WIWO |
| 1998 | The Gambia / Sierra Leone | | Exchange programme with training: 2 from Sierra Leone joined participants from The Gambia. AfWC networks established in both countries. | WI |
| 1998 | Togo | Lomé | Initial training workshop and set-up of a national wetlands and waterbirds network | WI |
| 1998 | Cameroon | Coastal wetlands | A capacity building waterbird & wetland survey of the whole coastline. | WI / Wader Study Group |
| 1998 | The Gambia, Sierra Leone | | A trainee from each country was supported to the RIZA wetland management course in Lelystad, The Netherlands. On return each became AfWC NC. | WI |
| 1998 | Senegal | Dakar | Sub-regional training course for West African AfWC NCs in setting up and running national wetland survey programmes | WI (Tim Dodman, Abdoulaye Ndiaye) |
| 1999 | Senegal, The Gambia, Guinea, Sierra Leone, Côte d'Ivoire, The Congo | | Initial wetlands & waterbirds inventory / monitoring training workshops leading to establishing the AfWC in new sites / new countries and developing national networks. | WI (Tim Dodman, Abdoulaye Ndiaye) |
| 1999 | Senegal | Dakar | Set up the AfWC database at the WI office – the first time for the database to run in Africa. Exchange / support with WI HQs. | WI |
| 2000 | Senegal, The Gambia | | National / site-based training workshops (wetlands / waterbirds). | WI (Tim Dodman, Abdoulaye Ndiaye) |
| 2000 | Senegal | Saloum | Support SAPAD for training ecoguides. | WI |
| 2000 | Guinea-Bissau | | Training workshop and field surveys. | WI / CWSS |
| 2000s | Mauritania | PNBA | Regular technical support for bird identification and monitoring in the field. | PNBA / FIBA (António Araujo) |
| 2001 | Liberia | Monrovia | First national AfWC training course, led by SCNL. | WI (SCNL) |
| 2001 | Cameroon | | National AfWC training course. | WI (COC) |
| 2001 | Guinea-Bissau | Bissau / Bubaque | Training course on Waterbird Identification & Counting. | WI (ODZH, Clive Barlow) |
| 2002 | Mauritania | Nouakchott / Diawling | A 10-day training course on wetland management and waterbird surveys, with 39 participants, including many students. | WI / PND / PNBA |
| 2002 | Sierra Leone | Freetown / Aberdeen Creek | A course introducing wetland management and wetland and waterbird monitoring to 25 participants from NGOs, government and FBC, aiming to strengthen national networks. | WI / CSSL |

| Year | Country | Site(s) | Capacity building activities | Lead(s) / Trainer(s) |
|---|---|---|---|---|
| 2004 | Cameroon / DR Congo | Douala-Edea | Exchange and training programme, with visit of OCPE to Cameroon to learn about coastal wetland management and monitoring. The workshop included a session on bird monitoring and field activities. | WI / CWCS (Gordon Ajonina) |
| 2004 | Guinea-Bissau | Mansoa / Bissau | Field workshop on the assessment of bird densities in rice habitats. Included participants from Senegal, The Gambia and Guinea. The workshop included training in methodology. | WI / A&W |
| 2004,2005, 2006 | Mauritania, Senegal, The Gambia & Guinea-Bissau | PNBA / Langue de Barbarie / Saloum / Bijol / Bijagós | Field training workshops in four countries in monitoring fish biodiversity using seabirds as indicators. Included training on colonial bird census, collection and analysis of food items and integrated monitoring. | WI (Jan Veen, Hanneke Dallmeijer) |
| 2005 | The Congo | Pointe Noire | Ecoregional workshop for the Gulf of Guinea; participants from all countries between Liberia and Angola. The workshop included a working group on conservation and monitoring of biodiversity. | WI (Tim Dodman, Abdoulaye Ndiaye, Moussa Sega Diop) |
| 2006-2007 | Guinea-Bissau | Bijagós, Jeta | Conservation and monitoring of IBAs in Guinea-Bissau 2006 – 2007. A partnership project with some training in monitoring. | WI / VBN |
| 2007 | Ghana | Accra, Sakumo | Regional IWC gap-filling workshop for West Africa under the WOW project | WI, BirdLife |
| 2007 | Nigeria | Dagona | Training Workshop on Wetland Monitoring in Nigeria | WI / APLORI (Shiwuua Manu) |
| 2007 | Cameroon | Coastal wetlands | Waterbird census of coastal Cameroon and Sanaga River. A two month census of the coastal zone, which included training local technicians in bird census techniques. | WI / WIWO / CWCS (Jaap van der Waarde, Gordon Ajonina) |
| 2009 | Cameroon | Limbe | West Africa regional ToT workshop on the flyway approach to conservation. | WI (Tim Dodman, Abdoulaye Ndiaye) |
| 2012 | Mauritania | Diawling | Regional workshop for EAF IWC NCs on waterbird identification and monitoring, with field training. | WSFI / BirdLife (Marc van Roomen, Tim Dodman, Geoffroy Citegetse, Abdoulaye Ndiaye) |
| 2013 | Guinea | Conakry | CMB meeting; included session on IWC and EAF monitoring for NCs and others.<br>Donation of WSFI binoculars and telescopes. | BirdLife (Geoffroy Citegetse; Marc van Roomen) |
| 2013 | Guinea-Bissau | Bubaque / Bijagós | Training course on migratory waterbird monitoring and conservation in a flyway context. | WSFI (Paulo Catry) |
| 2013 | Sierra Leone & Liberia | Kent | Training course to improve local competencies for implementing waterbird flyway conservation and sites / species monitoring. Included 3 participants from Liberia, with short field mission there.<br>Donation of binoculars and camera. | WSFI / CSSL & SCNL (Tim Dodman) |
| 2013 | Senegal | Dakar | Regional workshop for 15 EAF Africa & Sahel countries on database use, managing older data in IWC database, coordination practices, and on the importance of the flyway approach. | TdV (TSU – AEWA) / OFB, WI, BirdLife |
| 2013 | Senegal | Djoudj | Regional Training Workshop on the management of key sites along the Western coast of Africa for migratory birds. With 45 participants, including from most countries between Morocco and DR Congo, the workshop introduced the flyway approach to conservation, with field visits and monitoring. | WSFI / BirdLife / WI (Tim Dodman, Abdoulaye Ndiaye, Geoffroy Citegetse, Marc van Roomen) |
| 2014 | Sierra Leone | Tissana | Community waterbird training workshop, with field visits and covering use of optics | CSSL (Papanie Bay Sesay. Momoh Sesay) |
| 2014 | Angola | Luanda | ToT workshop on the flyway approach to the conservation and wise use of waterbirds and wetlands for all lusophone countries. The workshop included a field day and an introduction to waterbird monitoring. | AEWA / WSFI (Tim Dodman, Paulo Catry, Joãozinho Sa) |
| 2014 | Guinea-Bissau | Jeta | Support for monitoring and surveillance of seabird colonies at Bantambur island, especially through purchase of a pirogue (institutional capacity) | WSFI / ODZH |
| 2015, 2016 | Angola | Ilhéu dos Pássaros | Construction of a bird hide for monitoring, research and ecotourism; field training in waterbird identification and census | WSFI / INBAC (Miguel Xavier) |
| 2015-2025 | The Gambia | Coastal & riverine wetlands | Long-term (ongoing) support to the IWC in The Gambia through an annual partnership between WSFI, DPWM and WABSA. Included planning meetings, field surveys, evaluations and donation of equipment. | WSFI / National Park Administration Wadden Sea Lower Saxony (Peter Südbeck) |
| 2016 | Namibia / Angola | Walvis Bay | Angola-Namibia Exchange Programme: Participation of Angolan team in bird counts & coastal management of Walvis Bay. | WSFI / NACOMA (Miguel Xavier, Holger Kolberg) |
| 2016 | Gabon | Coastal wetlands | Intensive field training, with donation of telescopes and binoculars. | WSFI (Marc van Roomen, Erik van Winden) |

| Year | Country | Site(s) | Capacity building activities | Lead(s) / Trainer(s) |
|---|---|---|---|---|
| 2016 | Senegal | Dakar | 2-day EAF workshop before PAOC14 for 12 countries, mostly for NCs, in all aspects of monitoring waterbirds and environmental factors. | WSFI / WI (Marc van Roomen) |
| 2016 | Senegal | Dakar | Training on IBA monitoring and data management for Birdlife Partners at PAOC14 | BirdLife (Mike Evans, Zoltan Waliczky, Ademola Adjabe, Geoffroy Citegetse) |
| 2016 | Senegal | Dakar | PAOC: Major continent-spanning workshop. Provided strong element of building capacity for participants in presenting papers and participating in relevant symposia. Included launch of the WSFI field guide. | PAOC |
| 2016 | Sierra Leone | Tissana | Training Tour Guides for bird tourism promotion in Sierra Leone's coastal zone | WSFI / NACToG (Charles Showers) |
| 2017 | São Tomé e Príncipe | São Tomé coastline | First IWC count, with training for local stakeholders in bird identification and census techniques. | WSFI (Ricardo Faustino de Lima) |
| 2017 | Morocco | Dakhla Bay, Khnifiss | Building capacities of local associations in the Atlantic Moroccan Sahara in waterbird identification and monitoring. 2 training workshops, with field surveys. Donation of 2 telescopes and 6 binoculars. | WSFI (Imad Cherkaoui) |
| 2017 | Guinea-Bissau | Bijagós (Bubaque) | Training on bird identification, monitoring and use of data for policy advocacy (for participants from Bijagós, Cufada, Cantanhez, Cacheu) | BirdLife (Geoffroy Citegetse, Claudien) |
| 2018 | Senegal | Saloum | Training on colonial breeding birds and use of drone (for participants from PNBA, PND, Djoudj, Langue de Barbarie, Gueumbeul, Saloum, Kalissaye, Bijagós, Bantambour) | BirdLife (Miguel LeCoq) and Ecospace/VEDA (Eelke Folmer, Piet van den Hout) |
| 2018 | Senegal | Dakar | Regional training workshop on the use and manipulation of the IWC database. | WI (Tom Langendoen & Khady Gueye) |
| 2018 | Senegal | Saloum Delta | Regional workshop on data collection using ObsMap | WI / Natogora (Alain Paquet) |
| 2018-2020 | Guinea-Bissau | Bijagós Archipelago | Waders of the Bijagós project; one objective was to develop local capacity for research and monitoring within conservation organisations and create opportunities to train students at undergraduate and post-graduate levels. ODZH's role included training the "observer network" in bird monitoring. | IBAP / RUG / NIOZ / University of Aveiro / ODZH / others |
| 2018 | Guinea | Conakry | Intensive field training about sample counts and field identification. Donation of binoculars from VBN. | WSFI (Balla Moussa Condé, Roger Doré, Jutta Leyer, Marc van Roomen) |
| 2018-2020 | Senegal | Lower Senegal & Saloum deltas | Two projects on integrated management of the main deltas of Senegal both included some elements of bird research and training, including in monitoring. | DPNS |
| 2019 | Guinea-Bissau | Bissau | Workshop with IBAP and GPC to discuss monitoring. | WSFI / WI (Khady Gueye) |
| 2019 | Angola | Ilhéu dos Pássaros | Field training for students and volunteers in waterbird counts | WSFI / Bioconserv (Miguel Xavier) |
| 2019 | Guinea | Conakry | Intensive workshop and field training on bird identification, monitoring methods, count techniques, etc., with government and Guinée Écologie participants. | WSFI (Yvette Diallo, Roger Doré, Balla Mousa Condé, Marc van Roomen) |
| 2019 | Sierra Leone | Tasso | Intensive workshop and field training on bird identification, monitoring methods, count techniques, etc., with CSSL. | WSFI (Papanie Bai-Sesay, Richard Hearn, Marc van Roomen) |
| 2019 | Senegal | ROK, Casamance | Training in waterbird counts and using data collection tools, including initiation in the ObsMap app and completion of forms. | WSFI / WI (Pathé Balde, Khady Gueye) |
| 2019 | Senegal | Technopôle | WMBD workshop on the conservation of an important site of the EAF. Included training in ornithology of NCD volunteers and RNU-GNP agents. | WSFI / NCD (Seydina Issa Sylla, Bass Diallo) |
| 2019 | Benin | Cotonou, Lac Nokoué, Bouche du Roy | ToT workshop on the flyway approach to the conservation and wise use of waterbirds and wetlands for francophone countries of west and Central Africa. The workshop included a field day and an introduction to waterbird monitoring. | AEWA / WSFI (Tim Dodman, Abdoulaye Ndiaye) |
| 2019 | Senegal | Langue de Barbarie, Saloum, Kalissaye | Training workshops on disturbance monitoring protocol and seabird population analysis. The training at Langue de Barbarie also included agents from Gueumbeul. | BirdLife (Miguel LeCoq) |
| 2019 | Mauritania | PNBA | | |
| 2019 | Guinea-Bissau | Bijagós, Bantambour | | |
| 2019 | Morocco | Laayoun and Boujdour | Building capacities of local associations in the Atlantic Moroccan Sahara in waterbird identification and monitoring. 38 participants in 2 training workshops, with field surveys. Donation of 2 telescopes and 6 binoculars. | WSFI (Imad Cherkaoui) |

| Year | Country | Site(s) | Capacity building activities | Lead(s) / Trainer(s) |
|---|---|---|---|---|
| 2019 | Nigeria | Bakassi Local Government Area, Cross River State | Institutional Strengthening of Community Groups for Conservation of Mangrove and migratory birds. Included capacity building on identification, monitoring and data collection for migratory birds. | WSFI / NCF |
| 2019 | Guinea-Bissau | Bubaque, Bijagós | Regional training workshop in ecotourism for guides from Mauritania, Senegal, The Gambia and Guinea-Bissau. Included bird identification. | BirdLife (Tim Dodman, Ngone Diop, Hamilton Monteiro) |
| 2021 | Sierra Leone | Tasso | Promoting Nature-based and Bird Training for Tour Guides along the Sierra Leone River Estuary at Tasso Island. The workshop included training in bird identification. | WSFI / SLNGA |
| 2021 | Senegal | Beteny, Saloum Delta | Regional training workshop on the monitoring of coastal breeding birds. | WI (Nicolas Benty Gomis, Adama Lène, Hamilton Monteiro) |
| 2021 | Mauritania | PNBA | Training in waterbird identification and counting plus monitoring bird colonies for NGOs, in framework of PAZHOC. | PNBA / PAZHOC |
| 2022 | | | 2 day workshop and field visit with NCs & SCs of Mauritania, Senegal & Guinea-Bissau in preparation of 2023 total count. Explanation of results, monitoring design & environmental monitoring. | WSFI (Marc van Roomen, Geoffroy Citegetse, Gabin Agblonon, Khady Gueye) |
| 2022 | Cote d'Ivoire | Eotiles National Park | Training workshop on bird identification, counting and monitoring. | SOS Forêts |
| 2022 | Morocco | Guelmim and Dakhla | Building capacities of local associations in the Atlantic Moroccan Sahara in waterbird identification and monitoring. 2 training workshops, with field surveys. Donation of 6 binoculars. | WSFI (Imad Cherkaoui) |
| 2022 | Guinea-Bissau | | Workshop to discuss monitoring set-up (sample counts), coordination and data usage, with IBAP, ODZH & GPC. | WSFI / WI (Khady Gueye) |
| 2023 | Senegal | | Workshop on drone counts of breeding tern colonies; participants of Senegal, Mauritania & Guinea-Bissau. | WSFI / Eelke Folmer. With BirdLife & WI support |
| 2023 | Togo | Lomé / coastal wetlands | National workshop and counts to bring Togo back into the IWC network. Transboundary support from Benin. | WSFI (Farid Bahleman, Camille Tchankpan, Patrice Delagnon) |
| 2023 | Morocco | Khnifiss, Boujdour, Dakhla, Cintra Bay | Building capacities of local NGOs and early-career biologists in the Central Moroccan Atlantic and Cap Blanc in waterbird identification, monitoring, site management and Climate change impact assessment. 48 participants in 2 training workshops, with field surveys. Donation of 6 binoculars. | WSFI (Imad Cherkaoui) |
| 2023 | Gabon | Coastal wetlands | Field training for members of coastal IWC group; delivery of telescopes & binoculars. | WSFI / VBN (Jaap van der Waarde) |
| 2023 | Sierra Leone | Yawri Bay, Tissana | Training Workshop for young people/ youth of the Yawri Bay Communities. Introduction to waterbirds & identification for youth. | WSFI / SLNGA |
| 2023 | Angola | Tômbwa | Local actors received basic training in monitoring birds during an investigation of trade in cormorants and other seabirds. | WSFI / OBC (Miguel Xavier) |
| 2024 | Benin | Coastal wetlands | Monitoring breeding bird colonies, including building capacity in monitoring and drone use; purchase of drone fur future surveys. | WSFI (Camille Tchankpan) |
| 2024 | Mauritania | Cap Blanc / Baie de l'Etoile | First training course in the Cap Blanc peninsular, with participants mainly from local organisations. Included training in waterbird identification and counts with field visits to key sites. | WSFI (Tim Dodman, Imad Cherkaoui) |
| 2024 | Senegal | Saly | Training workshop on migratory waterbirds and IBA/KBA monitoring for sustainable management (BirdLife partners Morocco to South Africa; Senegal participants from Palmarin, Kalissaye and Tocc Tocc). | BirdLife (Fred, Alex, Geoffroy, Olivia, Steward) |
| 2024 | Senegal | Dakar, Kaolack, Kalissaye, Palmarin, Tocc Tocc | Training conducted at different sites on bird identification, plus monitoring of waterbirds, and on Lesser Kestrel and Swallow-tailed Kite where relevant. | LPO, BirdLife |
| 2025 | Cameroon | | Field training in using count unit boundaries, identification and monitoring protocols. | WSFI (Menno Hornman) |
| 2025 | Senegal | Dakar | Training workshop on KBAs for stakeholders in Senegal, including monitoring of site pressures and actions (NCD, DPNS, DAMPC, WI, CSE, Forest Department) | RSPB (Simmy Bezeng) |