

**BIODIVERSITY SURVEY IN AKANYARU
WETLANDS, UNPROTECTED IMPORTANT BIRD
AREAS IN RWANDA**



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EXECUTIVE SUMMARY

A Biodiversity Survey in Akanyaru Wetland, unprotected Important Bird Areas in Rwanda was conducted in the period of July and December 2008. The survey aimed to providing up-to-date baseline information on the biodiversity in Akanyaru wetland and the threats this IBA is facing.

The survey updated a checklist of the birds and mammals of Akanyaru wetlands, estimated the abundance of water birds at Lake Kamudeberi and assessed the conservation status of bird species in accordance with IUCN and CITES. Different threats affecting the Akanyaru wetland were also documented.

A total of 111 bird species gathered in 37 families, were recorded in Akanyaru wetlands by sights and/or sounds during the point counts, opportunistic sampling and total counts methods. Madagascar Pond Heron, an IUCN listed as endangered was recorded in the Northern of Akanyaru wetlands. Four bird species listed by CITES were recorded and these include Egyptian Goose, Hadada Ibis, Little Egret and Sacred ibis.

Waterbirds and their groups were selected according to the form “AFRICAN WATERBIRD CENSUS (AfWC), CENSUS FORM EASTERN AFRICA” elaborated by Wetland International. The population of eighteen species was counted in the lake Kamudeberi and the surrounding vegetation.

Seven species of Mammals were recorded in papyrus and Crocodile and Hippopotamus were observed in the waterbody of Akanyaru River. Other unidentified animals including species of Amphibians, Mouses, Fishes and Snakes were also recorded.

The information obtained on the use of the swamp and various attitudes of the people towards the swamp show that Akanyaru wetland is exposed to the serious threats. Akanyaru River is attacked by Water Hyacinth while the wetland is threatened mainly by human induced activities including agricultural, hunting, burning, extraction of vegetation, uncontrolled fishing, etc. Using a GIS program, we calculated the remaining areas of Papyrus in Akanyaru wetlands at 2,471.32671 ha and this is risk to the habitat of the biodiversity in this wetlands.

ACKNOWLEDGEMENTS

On the end of this survey, we are grateful to African Bird Club and Birdlife International for granting this work. The Local Administrative of Bugesera District enabled us access to Akanyaru Wetlands and ensured our security by providing us with the local defense's escort all the time we were in the field.

We address our thanks to the Authorities of the Akagera National Park for providing us with pairs of life jacket used while counting birds at Lake Kamudeberi.

We acknowledge the varied support from local people including the help in guidance showing us the applicable path in the sinking areas and transport in local canoes. We also acknowledge their valuable information on the use of the swamp and the name of the localities.

Our special thanks are addressed to Paul Kariuki Nda'nga'nga, a Species Programme Manager with Africa, BirdLife International / Africa Partnership Secretariat , for his assistance in the development of the proposal and Stephanie Tyler from ABC for the fruitful advices to achieve the current survey.

CHAPITRE I: AKANYARU WETLANDS

1.1 INTRODUCTION

Resources for conservation are always limited therefore attention should be focused on the highest conservation priorities. The conservation importance of an area is determined by assessing its biodiversity using species as the basic units of biodiversity. At the continental scale, inventory has permitted the definition of large-area administrative and planning units such as ecoregions (Olson *et al.* 2001; Wikramanayake *et al.* 2002 in Owiunji *et al.* 2005) and hotspots (Myers *et al.* 2000) within which conservation planning and management can occur.

Wetlands as one of nature resources ecosystem, they cover a wide variety of biodiversity, habitat types including rivers and lakes, coastal lagoons, peatlands and even coral reefs. Unfortunately, wetlands are ranked amongst the most highly threatened ecosystems on the planet and the degradation and loss of wetlands are continuing. The perpetuity of this loss may be caused mainly by a limited awareness, lack of law and policies implementation, lacking of data on biodiversity richness and the impact of their misuses

Currently in Rwanda, a total area of 165,000 hectares is covered by wetlands (Rwandagateway 2005). In East Africa, where Rwanda is located, wetlands have been lost and degraded as a result of human activities. This include a range of construction and development projects, cultivation, pollution, drainage, siltation (due to soil erosion), and the introduction of alien species (O'Connell *et al.*, inedit).

Different measures indispensable for the sustainability of the development and utilization of marshlands have been identified methods were proposed among them there are research, specific technical surveys and revision of policies and strategies (FAO, 2008).

Akanyaru Wetlands is one unprotected swamps and an Important Bird Area (RW005) identified through the Birdlife International criteria (Fishpool *et al.* 2001). In this IBA, marsh vegetation is cut and burned during the dry season, resulting in progressive habitat degradation.

This survey aimed at providing up-to-date baseline information on the biodiversity in Akanyaru wetland and the threats this IBA faces. After determining the list of Birds and Mammals and the population of waterbirds, we assessed the distribution of major habitat types, their extent and major human threats to the biodiversity.

Birds were surveyed using a line transect, opportunistic sampling and total count for waterbirds. Mammals were recorded using survey walk and indirect methods (dung counts, footprint survey). Then to record data on threats of the wetlands, all human and natural disturbance were recorded whenever were observed. Also a sample of people was interviewed on the use of the swamp.

1.2 Akanyaru wetlands

Akanyaru wetlands are located in the south of Rwanda on the international border with Burundi, at 29° 55' East 2° 30' South of coordinate and the altitude of 1350m. The vegetation consists of a variety of marshy habitats and papyrus swamp. Early successional stages are occupied by floating vegetation dominated by *Pistia stratiotes*, *Leersia hexandra* and *Oryza barthii*. Intermediate stages are a mixture of *Typha australis*, *Miscanthidium violaceum*, *Cladium jamaicense* and some papyrus. More complex habitats are occupied by *Typha australis*, *Miscanthidium violaceum*, *Cyperus denudatus*, *C. latifolius* and *Echinochloa pyramidalis*. There are expanses of papyrus, either as pure stands or combined with shrubby vegetation (Fishpool et al 2001).

The Akanyaru wetlands were identified as an Important Bird (RW005) through Birdlife International criteria A1 and A3 (A06). Akanyaru is a home of endangered bird species including Papyrus Gonolek “*Laniarius mufumbiri*” (NT), Papyrus Yellow Warbler “*Chloropeta gracilirostris*” (VU) and Madagascar Pond Heron “*Ardeola idea*” (EN). The wetlands are also a home of Sitatunga, an Endangered and a CITES listed mammal. The papyrus places are the shelter of Blue Monkeys (*Cercopithecus mitis dogetii*) and snakes, while waterway shelters Hippopotamus, Crocodiles and unidentified Fishes.

Akanyaru wetlands are unprotected and are facing multiple human threats. During the dry season, marsh vegetation is cut and burned resulting in progressive habitat degradation and farmers graze cattle inside the swamps. In the peatlands unused to agriculture, local communities collect building materials as well as arts and crafts materials such as Papyrus, Typha and trees of various woody creepers. They also gather fodder of grass as straw for banana plantations.

1.3 Lake Kamudeberi

Kamudeberi is an adjacent lake of almost two hectares, located in Mareba Sector, Bugesera District, Eastern Province. It is surrounded by small area of Typha followed by cultivated lands and the main crops are mazes and beans. The swamp in which Kamudeberi is located used to be a swamp of papyrus, connected to Akanyaru wetlands. Because of an increase of human population and a prolonged dry season in the region, there was a high demand of land for cultivation and the papyrus has been removed. Lake Kamudeberi is a result of the drained water when people were preparing the cultivated lands.

Chap II. Biodiversity Survey in Akanyaru wetlands

2.1 Birds Survey

2.1.1 Introduction

A Biodiversity survey and use of the wetlands studies were conducted in the Akanyaru Wetlands to produce information on the current situation of the site. Emphasis was placed on producing a bird checklist and documenting on category of birds for the development of a conservation strategy for the wetlands. The survey also served as a training exercise for a member of the Association pour la Conservation de la Nature au Rwanda (ACNR, Birdlife Affiliate in Rwanda), a student from National University of Rwanda to encourage him to undertake research in ornithology. Birds were detected by using sight and calls in point counts and opportunistic records were considered to maximize a number of encountered birds. The observers used 10 x 40 pairs of binoculars and a telescope and birds were identified using a standard text for East Africa (Fanshawe and Stevenson, 2002).

We conducted a survey in four sampling areas of Akanyaru wetlands selected according to the habitat types. These sites include Kinyovi, Nyiramatuntu, Murago, Akanyaru waterway and waterbirds of Lake Kamudeberi were counted. The period of sampling was between 7:00 to 11:00 in the morning and/or 3:00 to 5:30 in the afternoon.

2.1.2 Methodology.

Point counts

It was not easy to set transects across the swamps because of the water level which was high and trails are sinking, trails were set on the edge of the wetlands.

Fig. 1: ACNR CEO, a student Jean Apul and a Local guide crossing the Akanyaru wetlands, photo by ACNR



Points were established at an interval of 200m along the transect in four sites. A point is a single station from which a count is made and each point in this study was visited three times. At each point observers waited for 3 minutes to allow birds settle down and then recorded all sightings and calls of birds for a period of 10 minutes (Sutherland, W. 2000). We then moved on to the next point and repeated this same process. The data were used to produce a bird checklist and to document the threatened species. GPS readings and altitude were taken for each point where it was possible to help map the points and estimating the remaining area of Papyrus (Table 1).

Table 1: The average GPS points and altitude

Sampling area	Average GPS UTM/EW	Average GPS TM/NS	Average Altitude (m)
Akanyaru waterways	167604	9764601	1353
Kinyovi	166820	9762586	1356
Umurago	170689	9761021	1354
Nyiramatumu	1704178	9766647	1351
Kamudeberi	168651	9752761	1371

Opportunistic sampling

Opportunistic recording were used to maximize the number of species encountered in each transect. All bird species seen or heard at different times of the day were recorded. These data were used to complete the total record list of birds in Akanyaru Wetlands.

Total counts

Birds of Lake Kamudeberi were identified and directly counted. We used a canoe as a transport and we moved along side the edge of the lake counting all individuals of the identified species.

Fig. 2: Claudien in the local canoe at Kamudeberi, Photo ACNR



The counted number was filled in the African Waterbirds Census (AFWC) form of Wetland International (Annex 2).

2.2 Results

2.2.1 The surveyed sites

Our survey was conducted in three sectors of Bugesera District (Fig.3).

Figure 3: The surveyed sites at Akanyaru wetlands.



2.2.2 Total species list

A total of 111 bird species gathered in 38 families (Annex 1), were recorded by sights and/or sounds during the point counts, opportunistic sampling and total counts methods. The species lists were used to compare the different sites visited in Akanyaru wetlands. A total list of species found in Akanyaru wetlands is provided in Appendix of this report.

Bird species of ACCIPITRIDAE (11), PLOCEIDAE (9), ARDEIDAE (9), EMBERIZIDAE (7) and ANATIDAE (6) families are more represented in Akanyaru wetlands. Of all 38 families recorded in Akanyaru during this survey, 5 families are represented by two species while 16 are represented by one species (Table 2).

Table 2: Bird species by family

No	Family	No of species
1.	Accipitridae	11
2.	Alcedinidae	3
3.	Anatidae	6
4.	Ardeidae	9
5.	Charadriidae	2
6.	Ciconiidae	2
7.	Cisticolidae	2
8.	Coliidae	1
9.	Columbidae	4
10.	Corvidae	1
11.	Cuculidae	3
12.	Dicruridae	1
13.	Emberizidae	8
14.	Fringillidae	3
15.	Gruidae	1
16.	Hirundinidae	4
17.	Jacanidae	2

18.	Laniidae	3
19.	Malaconotidae	2
20.	Meropidae	1
21.	Motacillidae	5
22.	Muscicapidae	3
23.	Musophagidae	2
24.	Nectariniidae	5
25.	Passeridae	1
26.	Pelecanidae	2
27.	Phasianidae	1
28.	Ploceidae	9
29.	Pycnonotidae	1
30.	Rallidae	1
31.	Scolopacidae	1
32.	Scopidae	1
33.	Sylviidae	1
34.	Sturnidae	1
35.	Threskiornitidae	2
36.	Timaliidae	1
37.	Turdidae	4
38.	Zosteropidae	1
Total		111

2.2.3 IUCN and CITES listed species

The threatened species are key species for conservation of a site hence their presence/absence could be used as an indicator of the importance of a site for conservation. **Madagascar Pond Heron**, an IUCN listed as endangered species was recorded in the Northern of Akanyaru wetlands, near the junction to the Nyabarongo wetlands. Four bird species listed by CITES were recorded and these include Egyptian Goose, Hadada Ibis, Little Egret and Sacred ibis.

2.2.4 Bird counting at Lake Kamudeberi

Waterbirds and their groups were selected according to the form AFRICAN WATERBIRD CENSUS (AfWC), CENSUS FORM EASTERN AFRICA by Wetland International (annex 2). The population of eighteen species was counted in the lake and vegetation around with a big population of immature of Rufous-bellied Heron.

Table 3: Counted waterbirds at Kamudeberi

COMMON NAME	SCIENTIFIC NAME	FAMILY	No OF INDIV.
1. African Fish Eagle	<i>Haliaeetus vocifer</i>	Accipitridae	1
2. African Jacana	<i>Actophilornis africanus</i>	Jacanidae	10
3. African Marsh-harrier	<i>Cuircus ranivorus</i>	Accipitridae	2
4. Black Crake	<i>Amaurornis flavirostris</i>	Rallidae	2
5. Black-crowned Night-heron	<i>Nycticorax nycticorax</i>	Ardeidae	10
6. Black-headed Heron	<i>Ardea melanocephala</i>	Ardeidae	1
7. Great White Pelican	<i>Pelecanus onocrotalus</i>	Pelecanidae	3
8. Grey Heron	<i>Ardea cinerea</i>	Ardeidae	2
9. Hottentot Teal	<i>Anas hottentota</i>	Anatidae	4
10. Lesser Jacana	<i>Microparra capensis</i>	Jacanidae	34
11. Long-toed Lapwing	<i>Vanellus crassirostris</i>	Charadriidae	70
12. Marsh Sandpiper	<i>Tringa stagnatilis</i>	Scolopacidae	1
13. Rufous-bellied Heron	<i>Ardeola rufiventris</i>	Ardeidae	80
14. Sacred ibis	<i>Threskiornis aethiopicus</i>	Threskiornitidae	2
15. Squacco Heron	<i>Ardea ralloides</i>	Ardeidae	6
16. White-faced Whistling-duck	<i>Dendrocygna viduata</i>	Anatidae	110
17. Yellow-billed Duck	<i>Anas undulata</i>	Anatidae	33
18. Yellow-billed Stork	<i>Mycteria ibis</i>	Ciconiidae	17

2.3 Mammals

2.3.1 Methods: reconnaissance survey

Mammal's team followed the pre-existing human and animal paths in order to minimize the disturbance to the wetland. During the survey, the team recorded all signs of mammals or animals seen or heard and information provided by local people mainly hunters were also considered in order to complete our list. We also recorded the signs left by animals including dung, footprint or spoor, hairs, digging and nests.

2.3.2 Results

A total of 7 species of mammals were recorded in Akanyaru wetlands by direct and indirect observation as well as people's information.

Table 4: The list of mammals of Akanyaru wetland

No	Common name	Recording areas
1.	Sitatunga	Papyrus
2.	Otter	Papyrus
3.	Monkeys	Papyrus
4.	Hippopotamus	Water Body
5.	Hare	Papyrus
6.	Thrush	Papyrus
7.	Mouse	Papyrus

Other unidentified animals including species of Amphibians, Mouses, Fishes and Snakes were also recorded in Akanyaru wetlands. Local people informed us about the presence of Crocodile (reptile).

2.4 Use of Akanyaru wetlands

All human and natural disturbances were recorded whenever observed. Also a sample of household was interviewed on the use of the swamp. We also recorded GPS points of the remaining papyrus to estimate the surface.

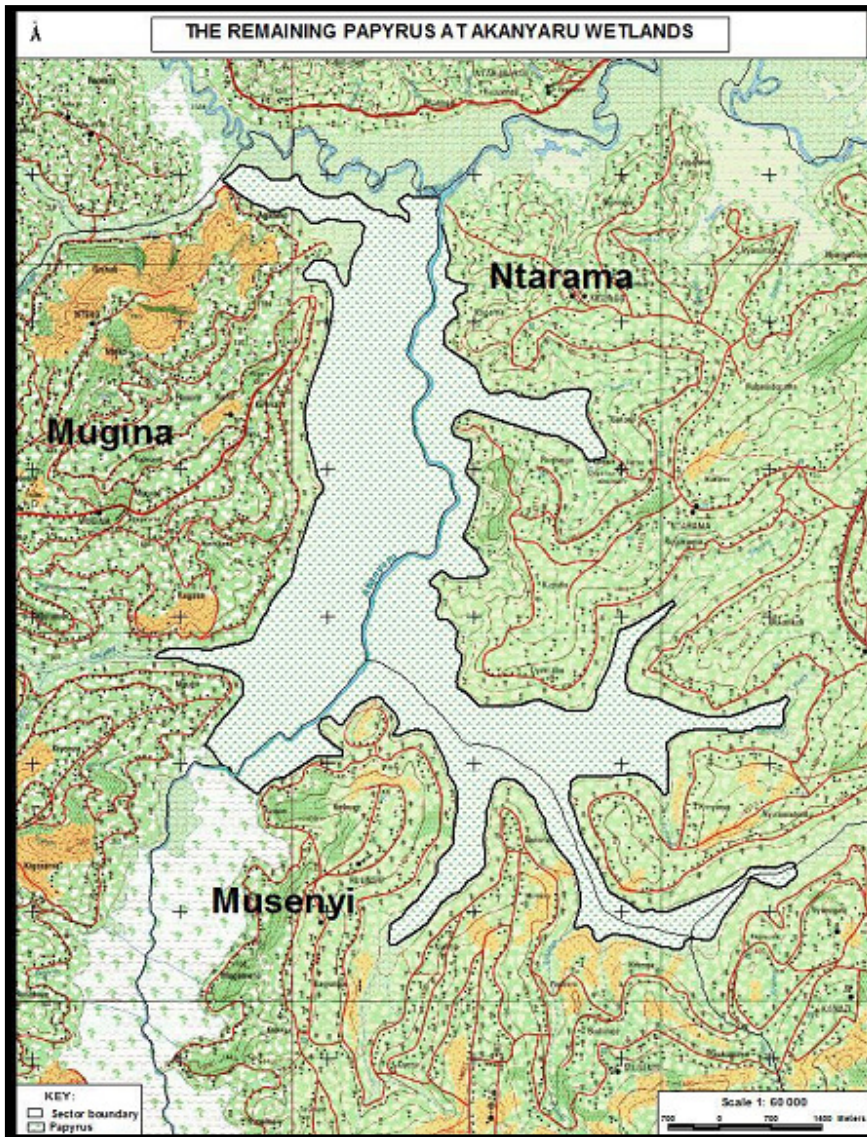
2.4.1 Results

The information obtained on the use of the swamp and various attitudes of the people towards the swamp show that Akanyaru wetland is exposed to the serious threats. The recorded threats include agricultural, hunting, extraction of vegetation for different uses, etc. and the swamp is anarchically exploited because of lack of other alternative incomes and persistence of poverty and dry seasons in the region.

2.4.1.1 Remaining Papyrus

Beside the points for the surveyed area, we covered the windings of the remaining papyrus to calculate the remaining areas and Arc View GIS 9.2 was used to analyze the GPS data. A surface of 2,471.32671ha was calculated as the remaining area of the Papyrus and is located in three Sectors namely Mugina (Kamonyi District), Ntarama and Musenyi (Bugesera District).

Figure 4: The remaining area of Papyrus at Akanyaru wetlands



2.4.1.1 Hunting

Animals hunted in Akanyaru wetlands include Sitatunga, Otter, Aphalophe, Hare, Thrush, and some waterbirds, mainly Ducks. According to hunters, animal are hunted for meats, to fulfill the protein incomes because of lack of enough livestock in Bugesera region. Some of the killed animals are not eaten in the region i.e Monkeys, Mouse, Hippopotamus and some species of birds, etc. but people are protecting their crop against

the damage caused by these animals. The hunting in this region is still traditional and hunters are using traps, bush fire and sometimes feral dogs.

The hunting may contribute to the reduction of the population of the hunted species and risks to cause the disappearance of rare species.

2.4.1.2 Cultivation and burning

In the surveyed area, swamp is highly encroached for the agriculture lands. People are getting in wetlands because of lack of enough suitable lands for cultivation during the dry season in the region. The main crops raised in the Akanyaru wetlands include mazes, vegetables like beans, cabbages, tomatoes, etc.

Fig. 5: A cultivated land for mazes in Akanyaru wetlands, photo by Claudien



While preparing the lands, people firstly burn or cut the vegetation to get a cultivation space (Figure 2). Through these activities, the biodiversity is destroyed and particularly, animals are dislodged and some time caught. Fire also kills the immature animals and destroys nests of birds. Agricultural activities are also reducing the stretch of the swamp and, thus, reduce the optimum space for the survival of certain species of large territory.

Figure 6: Papyrus burning at Akanyaru Wetlands, picture by Claudien



2.4.1.3 Grass cutting

Grass cutting is free in Akanyaru wetlands and is done mainly by women during the dry seasons because of inaccessibility in the wet seasons. The targeted grasses include Papyrus and Typha and are mainly used in hand craft making such as baskets, mattes, etc. They are also used in the houses construction where papyruses are used to make roofs, ceiling and enclosure because other materials like tiles and iron sheets are very expensive. Papyrus is also cut for mulching gardens of tomatoes, cabbages and banana plantations (Figure 7).

Fig. 7: Papyrus cut for mulching bananas plantation, picture by Claudien



2.4.1.4 Package

In Akanyaru wetlands, cows are kept in the wetlands mainly during the dry seasons. During the survey, we recorded many big herds of cows and 10 small houses of calf were recorded along the Akanyaru River (Figure 8).

Figure 8: Calf's houses along Akanyaru River, picture by Hakizimana



2.4.1.5 Water Hyacinth

The Northern of Akanyaru wetlands, near the junction with Nayabarongo River, is attacked by Water Hyacinth (Fig 5) and sometimes it stops the river. People apply the physical removal of the superficial stems and leaves but this is not a sustainable manner to fight this very dangerous plant to lakes and rivers in Rwanda.

Figure 9: Water hyacinth in Akanyaru Wetlands, picture by Claudien



CHAP III CONCLUSION AND RECOMMENDATIONS

The survey of the biodiversity and the use of the Akanyaru wetlands shows that the site is rich in biodiversity mainly birds and mammals. Unfortunately, the site is highly threatened by human and natural disturbances.

Papyrus is a habitat of threatened bird species like Madagascar Pond Heron, Papyrus Gonolec and Mammals like Statunga, Endangered and a CITES listed species. It provides also habitat for all recorded mammals in Akanyaru wetlands, except Hippopotamus recorded in waterbody. This habitat remains at a very small scale and it is highly declining in favor of human activities. These activities are destroying habitat and sometimes cause the disappearance or limit the reproduction of some animals. In Akanyaru wetlands, the population of Sitatunga is highly reduced mainly at Nyiramantuntu and Kinyovi where people mentioned the disappearance of the species.

Lake Kamudeberi with some waterbirds and a breeding site for Rufous-bellied Heron is surrounded by cultivated lands and people are still fishing and hunting Ducks in this lake. At the lake, the unorganized and uncontrolled fishing may destroy young fishes and limit the breeding activity.

The biodiversity survey was conducted on the small scale because of limited time and funds and some biodiversity components were not covered because of limited expertise. We also noticed that the main reasons for the misuse of Akanyaru wetlands are poverty and lack of coordination in the use of wetlands resources .

Hence, we recommend that:

1. The survey be extended on different seasons and covers all aspect of biodiversity
2. For the better use of the wetlands and Lake Kamudeberi resources, fishers and handcraftsmakers be organized in cooperatives, registered by local authorities and have organized activities (fishing and extraction of vegetation).
3. There are a high number of packages in Akanyaru wetlands because of traditional rearing in the region. We encourage the modern rearing which requires a small

- space but also is more productive in terms of milk and this should solve the problem of animal protein scarcity noticed in the region.
4. Local people may be sensitized to other source of proteins like smaller livestock, beekeeping, mushroom cultivation, etc.
 5. All activities in/around Akanyaru wetlands and Lake Kamudeberi respect the Organic Law determining the modalities of protection, conservation and promotion of environment in Rwanda of 08 April 2005 (Republic of Rwanda, 2005), especially the Article 85 stipulating that “with exception of activities related to protection and conservation of streams, rivers and lakes, an agricultural activities shall respect a distance of ten (10) meters away from the banks of streams and rivers and fifty (50) meters away from the banks of lakes. In such distances there shall be no agricultural activities permitted to be carried out”.

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ANNEXES

Table 5: Bird checklist of Akanyaru Wetlands


No	COMMON NAME	SC NAME	FAMILY	STATUS
1.	African crested-flycatcher?	<i>Bradypterus baboecala</i>	SYLVIIDAE	LC
2.	African Citril	<i>Serinus citrinelloides</i>	FRINGILLIDAE	LC
3.	African Crested-flycatcher	<i>Trochocercus cyanomelas</i>	MUSCICAPIDAE	LC
4.	African Fish Eagle	<i>Haliaeetus vocifer</i>	ACCIPITRIDAE	LC
5.	African Golden-breasted Bunting	<i>Emberiza flaviventris</i>	EMBERIZIDAE	LC
6.	African Green-Pigeon	<i>Treron calva</i>	COLUMBIDAE	LC
7.	African Harrier-hawk	<i>Polyboroides typus</i>	ACCIPITRIDAE	LC
8.	African Jacana	<i>Actophilornis africanus</i>	JACANIDAE	LC
9.	African Marsh-harrier	<i>Circus ranivorus</i>	ACCIPITRIDAE	LC
10.	African Paradise-flycatcher	<i>Terpsiphone viridis</i>	MUSCICAPIDAE	LC
11.	African Pied Wagtail	<i>Motacilla aguimp</i>	MOTACILLIDAE	LC
12.	African Yellow White-eye	<i>Zosterops senegalensis</i>	ZOSTEROPIDAE	LC
13.	Arrow-marked Babbler	<i>Turdoides jardinei</i>	TURDIDAE	LC
14.	Augur Buzzard	<i>Buteo augur</i>	ACCIPITRIDAE	LC
15.	Baglafaecht Weaver	<i>Ploceus baglafaecht</i>	PLOCEIDAE	LC
16.	Black Crake	<i>Amaurornis flavirostris</i>	RALLIDAE	LC
17.	Black Kite	<i>Milvus migrans</i>	ACCIPITRIDAE	LC
18.	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	ARDEIDAE	LC
19.	Black-crowned Tchagra	<i>Tchagra senegala</i>	MALACONOTIDAE	LC
20.	Black-crowned Waxbill	<i>Estrilda nonnula</i>	EMBERIZIDAE	LC
21.	Black-headed Heron	<i>Ardea melanocephala</i>	ARDEIDAE	LC
22.	Black-headed Weaver	<i>Ploceus melanocephalus</i>	PLOCEIDAE	LC
23.	Black-winged Kite	<i>Elanus caeruleus</i>	ACCIPITRIDAE	LC
24.	Blue-headed coucal	<i>Centropus monachus</i>	CUCULIDAE	LC
25.	Bronze Mannikin	<i>Lonchura cucullata</i>	EMBERIZIDAE	LC
26.	Bronze Sunbird	<i>Nectarinia Kilimensis</i>	NECTARINIIDAE	LC
27.	Brown-backed Scrub-robin	<i>Erythropygia hartlaubi</i>	TURDIDAE	LC

28.	Cape Wagtail	<i>Motacilla capensis</i>	MOTACILLIDAE	LC
29.	Carruthers's Cisticola	<i>Cisticola carruthersi</i>	CISTICOLIDAE	LC
30.	Cattle Egret	<i>Bubulcus ibis</i>	ARDEIDAE	LC
31.	Chubb's Cisticola	<i>Cisticola chubbi</i>	CISTICOLIDAE	LC
32.	Common bulbul	<i>Pycnonotus barbatus</i>	PYCNONOTIDAE	LC
33.	Common Fiscal	<i>Lanius collaris</i>	LANIIDAE	LC
34.	Common Waxbill	<i>Estrilda astrild</i>	EMBERIZIDAE	LC
35.	Crimson-rumped Waxbill	<i>Estrilda rhodopyga</i>	EMBERIZIDAE	LC
36.	Diederik Cuckoo	<i>Chrysococcyx caprius</i>	CUCULIDAE	LC
37.	Eastern Grey Plantain-eater	<i>Crinifer zonurus</i>	MUSOPHAGIDAE	LC
38.	Egyptian goose	<i>Alopochen aegyptiacus</i>	ANATIDAE	LC
39.	Emerald-spotted Wood-Dove	<i>Turtur chalcospilos</i>	COLUMBIDAE	LC
40.	Fan-tailed Widowbird	<i>Euplectes axillaris</i>	PLOCEIDAE	LC
41.	Folk-tailed Drongo	<i>Dicrurus adsimilis</i>	DICRURIDAE	LC
42.	Grassland Pipit	<i>Anthus cinnamomeus</i>	MOTACILLIDAE	LC
43.	Great White Pelican	<i>Pelecanus onocrotalus</i>	PELECANIDAE	LC
44.	Green-headed Sunbird	<i>Cyanomitra verticalis</i>	NECTARINIIDAE	LC
45.	Grey Crowned Crane	<i>Balearica regulorum</i>	GRUIDAE	LC
46.	Grey Heron	<i>Ardea cinerea</i>	ARDEIDAE	LC
47.	Grey Kestrel	<i>Falco ardosiaceus</i>	ACCIPITRIDAE	LC
48.	Grey-backed Fiscal	<i>Lanius excubitoroides</i>	LANIIDAE	LC
49.	Grey-headed Sparrow	<i>Passer griseus</i>	PASSERIDAE	LC
50.	Hadada Ibis	<i>Bostrychia hagedash</i>	THRESKIORNITIDAE	LC
51.	Hamerkop	<i>Scopus umbretta</i>	SCOPIIDAE	LC
52.	Holub's Golden Weaver	<i>Ploceus xanthops</i>	PLOCEIDAE	LC
53.	Hottentot Teal	<i>Anas hottentota</i>	ANATIDAE	LC
54.	Intermediate Egret	<i>Mesophoyx intermedia</i>	ARDEIDAE	LC
55.	Lesser Jacana	<i>Microparra capensis</i>	JACANIDAE	LC
56.	Long-crested Eagle	<i>Lophaetus occipitalis</i>	ACCIPITRIDAE	LC
57.	Little Bee-eater	<i>Merops pusillus</i>	MEROPIDAE	LC
58.	Little Egret	<i>Egretta garzetta</i>	ARDEIDAE	LC
59.	Little Sparrowhawk	<i>Accipiter minullus</i>	ACCIPITRIDAE	LC
60.	Long-crested Eagle	<i>Lophaetus occipitalis</i>	ACCIPITRIDAE	LC

61.	Long-billed Pipit	<i>Anthus similis</i>	MOTACILLIDAE	LC
62.	Long-toed Lapwing	<i>Vanellus crassirostris</i>	CHARADRIIDAE	LC
63.	Mackinnon's Shrike	<i>Lanius mackinnoni</i>	LANIIDAE	LC
64.	Madagascar Pond-Heron	<i>Ardeola idae</i>	ARDEIDAE	EN
65.	Malachite Kingfisher	<i>Alcedo cristata</i>	ALCEDINIDAE	LC
66.	Mariqua Sunbird	<i>Nectarinia mariquensis</i>	NECTARINIIDAE	LC
67.	Marsh Sandpiper	<i>Tringa stagnatilis</i>	SCOLOPACIDAE	LC
68.	Northern Brown-throated Weaver	<i>Ploceus castanops</i>	PLOCEIDAE	LC
69.	Opened-billed Stork	<i>Anastomus lamelligerus</i>	CICONIIDAE	LC
70.	Papyrus Canary	<i>Serinus koliensis</i>	FRINGILLIDAE	LC
71.	Pied Crow	<i>Corvus albus</i>	CORVIDAE	LC
72.	Pied kingfisher	<i>Ceryle rudis</i>	ALCEDINIDAE	LC
73.	Pink-backed Pelican	<i>Pelecanus rufescens</i>	PELECANIDAE	LC
74.	Red-billed Teal	<i>Anas erythoryncha</i>	ANATIDAE	LC
75.	Red-billed Firefinch	<i>Lagonosticta senegala</i>	ESTRILDIDAE	LC
76.	Red-chested Sunbird	<i>Nectarinia erythrocerca</i>	NECTARINIIDAE	LC
77.	Red-eyed Dove	<i>Streptopelia semitorquata</i>	COLUMBIDAE	LC
78.	Red-rumped Swallow	<i>Hirundo daurica</i>	HIRUNDINIDAE	LC
79.	Rock Martin	<i>Hirundo fuligula</i>	HIRUNDINIDAE	LC
80.	Ross's Turaco	<i>Musophaga rossae</i>	MUSOPHAGIDAE	LC
81.	Rueppell's Glossy-starling	<i>Lamprotornis purpuroptera</i>	STURNIDAE	LC
82.	Rufous-bellied Heron	<i>Ardeola rufiventris</i>	ARDEIDAE	LC
83.	Sacred ibis	<i>Threskiornis aethiopicus</i>	THRESKIORNITIDAE	LC
84.	Scaly Flancolin	<i>Francolinus squamatus</i>	PHASIANIDAE	LC
85.	Scarlet-chested Sunbird	<i>Nectarinia senegalensis</i>	NECTARINIIDAE	LC
86.	Sharpe's Pied-Babbler	<i>Turdoides sharpei</i>	TIMALIIDAE	LC
87.	Slender-billed Weaver	<i>Ploceus pelzelni</i>	PLOCEIDAE	LC
88.	Southern Yellow-rumped Seedeater	<i>Serinus atrogularis</i>	FRINGILLIDAE	LC
89.	Speckled mousebird	<i>Colius striatus</i>	COLIIDAE	LC
90.	Spectacled Weaver	<i>Ploceus ocularis</i>	PLOCEIDAE	LC
91.	Spur-winged Goose	<i>Plectropterus gambensis</i>	ANATIDAE	LC

92.	Squacco Heron	<i>Ardea ralloides</i>	ARDEIDAE	LC
93.	Swamp Alseonax	<i>Muscicapa aquatica</i>	MUSCICAPIDAE	LC
94.	Tambourine Dove	<i>Turtur tympanistria</i>	COLUMBIDAE	LC
95.	Tropical Boubou	<i>Laniarius aethiopicus</i>	MALACONOTIDAE	LC
96.	Wattled Lapwing	<i>Vanellus senegallus</i>	CHARADRIIDAE	LC
97.	Western Marsh-harrier	<i>Circus aeruginosus</i>	ACCIPITRIDAE	LC
98.	White-browed Coucal	<i>Centropus supercilium</i>	CUCULIDAE	LC
99.	White-browed Robin-chat	<i>Cossypha heuglini</i>	TURDIDAE	LC
100.	White-collared Oliveback	<i>Nesocharis ansorgei</i>	EMBERIZIDAE	LC
101.	White-faced Whistling-duck	<i>Dendrocygna viduata</i>	ANATIDAE	LC
102.	White-headed Saw-wing	<i>Psaldoprocne albiceps</i>	HIRUNDINIDAE	LC
103.	White-winged Widowbird	<i>Euplectes albonotatus</i>	EMBERIZIDAE	LC
104.	Wire-tailed Swallow	<i>Hirundo smithii</i>	HIRUNDINIDAE	LC
105.	Woodland kingfisher	<i>Halcyon senegalensis</i>	ALCEDINIDAE	LC
106.	Yellow Bishop	<i>Euplectes capensis</i>	PLOCEIDAE	LC
107.	Yellow-backed Weaver	<i>Ploceus melanocephalus</i>	PLOCEIDAE	LC
108.	Yellow-billed Duck	<i>Anas undulata</i>	ANATIDAE	LC
109.	Yellow-billed Stork	<i>Mycteria ibis</i>	CICONIIDAE	LC
110.	Yellow-throated Greenbull	<i>Chlorocichla flavicollis</i>	TURDIDAE	LC
111.	Yellow-throated Longclaw	<i>Macronyx croceus</i>	MOTACILLIDAE	LC

Table 6: AFRICAN WATERBIRD CENSUS (AfWC) FORM, EASTERN AFRICA

COMPILER'S name and address:		AFRICAN WATERBIRD CENSUS (AfWC) CENSUS FORM EASTERN AFRICA		 BP 8060, Dakar-Yoff, SENEGAL wetlands@sentoo.sn Fax. +221 8206479			
DATE OF COUNT:		COUNTRY:					
TIME OF DAY:		VISIBILITY: %					
NAME OF SITE:							
PROVINCE/STATE:			SITE CODE:				
NEAREST LARGE TOWN:			(Wetlands International can supply this code)				
WAY OF COUNTING:			HAS THE SITE BEEN COUNTED BEFORE? YES <input type="checkbox"/> NO <input type="checkbox"/>				
<input type="checkbox"/> Aerial <input type="checkbox"/> on Foot <input type="checkbox"/> Vehicle <input type="checkbox"/> Boat <input type="checkbox"/> Mixed			IF COUNTED BEFORE AS PART OF A LARGER SITE, WHICH SITE(S)?				
COVERAGE OF THE WETLAND (APPROX.): %			If less than 100%, please show area covered on added sketch-map				
CONDITION OF THE WETLAND (e.g. wet, dry, polluted, modified):			TYPE OF COUNT: TOTAL COUNT <input type="checkbox"/> SAMPLE COUNT <input type="checkbox"/>				
			PRECISION: ACTUAL COUNT <input type="checkbox"/> ESTIMATES <input type="checkbox"/>				
			Please mark species estimates with an 'E'				
			PRESENCE/ABSENCE				
			If no counts are made, please record Presence with a 'Tick' (✓)				
SITE STATUS (protection/management):			DISTURBANCE: MOTOR BOATS <input type="checkbox"/> LOW-FLYING AIRCRAFT <input type="checkbox"/>				
National Park <input type="checkbox"/> Nature Reserve <input type="checkbox"/> Private <input type="checkbox"/> No Status <input type="checkbox"/>			FISHING <input type="checkbox"/> HUNTING/TRAPPING <input type="checkbox"/> OTHER (specify) <input type="checkbox"/>				
Other (please specify) <input type="checkbox"/>							
BREEDING BIRDS: Please mark any currently breeding species with a 'B' (and indicate number of pairs if known)							
<i>Total</i>		GREBES		<i>Total</i>		STORKS	
PODCR		Great Crested Grebe - <i>Podiceps cristatus</i>		MYCIB		Yellow-billed Stork - <i>Mycteria ibis</i>	
TACRU		Little Grebe - <i>Tachybaptus ruficollis</i>		ANALA		African Open-billed Stork - <i>Anastomus lamelligerus</i>	
PODNI		Black-necked Grebe - <i>Podiceps nigricollis</i>		CICNI		Black Stork - <i>Ciconia nigra</i>	
				CICAB		Abdim's Stork - <i>Ciconia abdimii</i>	
<i>Total</i>		PELICANS		CICEP		Woolly-necked Stork - <i>Ciconia episcopus</i>	
PELON		Great White Pelican - <i>Pelecanus onocrotalus</i>		CICCI		White Stork - <i>Ciconia ciconia</i>	

PELRU	_____	Pink-backed Pelican - <i>Pelecanus rufescens</i>	EPHSE	_____	Saddle-billed Stork - <i>Ephippiorhynchus senegalensis</i>
PELEC	_____	unidentified pelicans - <i>Pelecanus spp.</i>	LEPCR	_____	Marabou Stork - <i>Leptoptilos crumeniferus</i>
			STORK	_____	unidentified storks - <i>Ciconiidae spp.</i>
<i>Total</i>	_____	CORMORANTS & DARTER			
PHACA	_____	Great Cormorant - <i>Phalacrocorax carbo</i>	<i>Total</i>	_____	IBISES & SPOONBILLS
PHAAF	_____	Long-tailed Cormorant - <i>Phalacrocorax africanus</i>	THRAE	_____	Sacred Ibis - <i>Threskiornis aethiopicus</i>
PHALA	_____	unidentified cormorants - <i>Phalacrocorax spp.</i>	HAGHA	_____	Hadada Ibis - <i>Bostrychia hagedash</i>
ANHRU	_____	African Darter - <i>Anhinga rufa</i>	BOSCA	_____	Wattled Ibis - <i>Bostrychia carunculata</i>
			PLEFA	_____	Glossy Ibis - <i>Plegadis falcinellus</i>
<i>Total</i>	_____	HERONS & EGRETS	PLALE	_____	Eurasian Spoonbill - <i>Platalea leucorodia</i>
ARDCI	_____	Grey Heron - <i>Ardea cinerea</i>	PLAAL	_____	African Spoonbill - <i>Platalea alba</i>
ARDME	_____	Black-headed Heron - <i>Ardea melanocephala</i>			
ARDGO	_____	Goliath Heron - <i>Ardea goliath</i>	<i>Total</i>	_____	HAMERKOP & SHOEBILL
ARDPU	_____	Purple Heron - <i>Ardea purpurea</i>	SCOOM	_____	Hamerkop - <i>Scopus umbretta</i>
EGRAL	_____	Great Egret - <i>Casmerodius albus</i>	BALRX	_____	Shoebill - <i>Balaeniceps rex</i>
EGRAR	_____	Black Heron - <i>Egretta ardesiaca</i>			
EGRIN	_____	Yellow-billed Egret - <i>Mesophoyx intermedia</i>	<i>Total</i>	_____	FLAMINGOS
EGRDI	_____	Dimorphic Egret - <i>Egretta dimorpha</i>	PHORO	_____	Greater Flamingo - <i>Phoenicopterus ruber roseus</i>
EGRGA	_____	Little Egret - <i>Egretta garzetta</i>	PHOMI	_____	Lesser Flamingo - <i>Phoenicopterus minor</i>
EGRGU	_____	Western Reef Heron - <i>Egretta gularis</i>	PHOEN	_____	unidentified flamingos - <i>Phoenicopteridae spp.</i>
BUBIB	_____	Cattle Egret - <i>Bubulcus ibis</i>			
EGRET	_____	unidentified egrets - <i>Egretta/Bubulcus spp.</i>	<i>Total</i>	_____	CRANES
ARDRA	_____	Squacco Heron - <i>Ardeola ralloides</i>	GRUGR	_____	Common Crane - <i>Grus grus</i>
ARDID	_____	Madagascar Squacco Heron - <i>Ardeola idae</i>	BUGCA	_____	Wattled Crane - <i>Grus carunculatus</i>
ARDRU	_____	Rufous-bellied Heron - <i>Ardeola rufiventris</i>	ANTVI	_____	Demoiselle Crane - <i>Grus virgo</i>
BUTST	_____	Green-backed Heron - <i>Butorides striatus</i>	BALPA	_____	Black Crowned Crane - <i>Balearica pavonina</i>
NYCNY	_____	Black-crowned Night-heron - <i>Nycticorax nycticorax</i>	BALRE	_____	Grey Crowned Crane - <i>Balearica regulorum</i>
IXOMI	_____	Little Bittern - <i>Ixobrychus minutus</i>			
IXOST	_____	Dwarf Bittern - <i>Ixobrychus sturmii</i>			FINFOOT
ARDEI	_____	unidentified Ardeidae - <i>Ardeidae spp.</i>	PODSE	_____	African Finfoot - <i>Podica senegalensis</i>
<i>Total</i>	_____	GEESE & DUCKS	CHAAL	_____	Kentish Plover - <i>Charadrius alexandrinus</i>
DENBI	_____	Fulvous Whistling Duck - <i>Dendrocygna bicolor</i>	CHAMA	_____	White-fronted Plover - <i>Charadrius marginatus</i>
DENVI	_____	White-faced Whistling Duck - <i>Dendrocygna viduata</i>	CHAPA	_____	Chestnut-banded Plover - <i>Charadrius pallidus</i>
THALE	_____	White-backed Duck - <i>Thalassornis leuconotus</i>	CHAMO	_____	Lesser Sandplover - <i>Charadrius mongolus</i>
PLEGA	_____	Spur-winged Goose - <i>Plectropterus gambensis</i>	CHALE	_____	Greater Sandplover - <i>Charadrius leschenaultii</i>
SARME	_____	Knob-billed Duck - <i>Sarkidiornis melanotos</i>	CHAAS	_____	Caspian Plover - <i>Charadrius asiaticus</i>
ALOAE	_____	Egyptian Goose - <i>Alopochen aegyptiacus</i>	LIMLI	_____	Black-tailed Godwit - <i>Limosa limosa</i>
CYACY	_____	Blue-winged Goose - <i>Cyanochen cyanopterus</i>	LIMLA	_____	Bar-tailed Godwit - <i>Limosa lapponica</i>
NETAU	_____	African Pygmy Goose - <i>Nettapus auritus</i>	NUMPH	_____	Whimbrel - <i>Numenius phaeopus</i>
ANAPE	_____	Eurasian Wigeon - <i>Anas penelope</i>	NUMAR	_____	Eurasian Curlew - <i>Numenius arquata</i>
ANACR	_____	Common Teal - <i>Anas crecca</i>	TRIER	_____	Spotted Redshank - <i>Tringa erythropus</i>
ANACA	_____	Cape Teal - <i>Anas capensis</i>	TRITO	_____	Common Redshank - <i>Tringa totanus</i>
ANAUN	_____	Yellow-billed Duck - <i>Anas undulata</i>	TRIST	_____	Marsh Sandpiper - <i>Tringa stagnatilis</i>
ANAAC	_____	Northern Pintail - <i>Anas acuta</i>	TRINE	_____	Common Greenshank - <i>Tringa nebularia</i>
ANAER	_____	Red-billed Teal - <i>Anas erythrorhynchos</i>	TRIOC	_____	Green Sandpiper - <i>Tringa ochropus</i>

ANAHO		Hottentot Teal - <i>Anas hottentota</i>	TRIGL		Wood Sandpiper - <i>Tringa glareola</i>
ANAQU		Garganey - <i>Anas querquedula</i>	ACTHY		Common Sandpiper - <i>Tringa hypoleucos</i>
ANAACL		Northern Shoveler - <i>Anas clypeata</i>	XENCI		Terek Sandpiper - <i>Tringa cinereus</i>
NETER		Southern Pochard - <i>Netta erythroptalma</i>	AREIN		Ruddy Turnstone - <i>Arenaria interpres</i>
OXYMA		Maccoa Duck - <i>Oxyura maccoa</i>	GALNI		African Snipe - <i>Gallinago nigripennis</i>
DUCKS		unidentified ducks - <i>Anatinae spp.</i>	GALMD		Great Snipe - <i>Gallinago media</i>
			GALGA		Common Snipe - <i>Gallinago gallinago</i>
Total		RAILS, GALLINULES & COOTS	CALAA		Sanderling - <i>Calidris alba</i>
RALCA		African Water Rail - <i>Rallus caerulescens</i>	CALMI		Little Stint - <i>Calidris minuta</i>
POREG		African Crake - <i>Crecopsis egregia</i>	CALFE		Curlew Sandpiper - <i>Calidris ferruginea</i>
PORFL		Black Crake - <i>Amaurornis flavirostra</i>	PHIPU		Ruff - <i>Philomachus pugnax</i>
GALCH		Common Moorhen - <i>Gallinula chloropus</i>	WADER		unidentified waders - <i>Charadrii spp.</i>
GALAN		Lesser Moorhen - <i>Gallinula angulata</i>			
GALAL		Allen's Gallinule - <i>Porphyrio alleni</i>	Total		GULLS, TERNS & SKIMMER
PORPO		Purple Swamphen - <i>Porphyrio porphyrio</i>	LARLE		White-eyed Gull - <i>Larus leucophthalmus</i>
FULCR		Red-knobbed Coot - <i>Fulica cristata</i>	LARHE		Sooty Gull - <i>Larus hemprichii</i>
RAILS		unidentified Rallids - <i>Rallidae spp.</i>	LARFU		Lesser Black-backed Gull - <i>Larus fuscus</i>
			LARCI		Grey-headed Gull - <i>Larus cirrocephalus</i>
Total		JACANAS	LARGE		Slender-billed Gull - <i>Larus genei</i>
MICCA		Lesser Jacana - <i>Microparra capensis</i>	LARRI		Black-headed Gull - <i>Larus ridibundus</i>
ACTAF		African Jacana - <i>Actophilornis africana</i>	LARUS		unidentified gulls - <i>Larus spp.</i>
			CHLHY		Whiskered Tern - <i>Chlidonias hybridus</i>
Total		WADERS/Shorebirds	CHLLE		White-winged Tern - <i>Chlidonias leucopterus</i>
ROSBE		Greater Painted-Snipe - <i>Rostratula benghalensis</i>	GELNI		Gull-billed Tern - <i>Gelochelidon nilotica</i>
DROAR		Crab-Plover - <i>Dromas ardeola</i>	STECA		Caspian Tern - <i>Sterna caspia</i>
HAEOS		Eurasian Oystercatcher - <i>Haematopus ostralegus</i>	STEHI		Common Tern - <i>Sterna hirundo</i>
HIMHI		Black-winged Stilt - <i>Himantopus himantopus</i>	STERE		White-cheeked Tern - <i>Sterna repressa</i>
RECAV		Pied Avocet - <i>Recurvirostra avosetta</i>	STEFU		Sooty Tern - <i>Sterna fuscata</i>
BURSE		Senegal Thick-knee - <i>Burhinus senegalensis</i>	STEAL		Saunders's Tern - <i>Sterna saundersi</i>
BURVE		Water Thick-knee - <i>Burhinus vermiculatus</i>	STEBR		Greater Crested Tern - <i>Sterna bergii</i>
BURCA		Spotted Thick-knee - <i>Burhinus capensis</i>	STEBE		Lesser Crested Tern - <i>Sterna bengalensis</i>
CURTE		Temminck's Courser - <i>Cursorius temminckii</i>	STERN		unidentified <i>Sterna</i> terns - <i>Sterna spp.</i>
GLAPR		Collared Pratincole - <i>Glareola pratincola</i>	ANOST		Brown Noddy - <i>Anous stolidus</i>
GLANU		Rock Pratincole - <i>Glareola nuchalis</i>	RYNFL		African Skimmer - <i>Rhynchops flavirostris</i>
VANCR		Long-toed Plover - <i>Vanellus crassirostris</i>			
VANAR		Blacksmith Plover - <i>Vanellus armatus</i>	Total		BIRDS OF PREY
VANSP		Spur-winged Plover - <i>Vanellus spinosus</i>	PANHA		Osprey - <i>Pandion haliaetus</i>
VANTE		Black-headed Plover - <i>Vanellus tectus</i>	HALVO		African Fish Eagle - <i>Haliaeetus vocifer</i>
VANLU		Senegal Plover - <i>Vanellus lugubris</i>	CIRAE		Eurasian Marsh Harrier - <i>Circus aeruginosus</i>
VANME		Black-winged Plover - <i>Vanellus melanopterus</i>	CIRRA		African Marsh Harrier - <i>Circus ranivorus</i>
VANCO		Crowned Plover - <i>Vanellus coronatus</i>	CIRMA		Pallid Harrier - <i>Circus macrourus</i>
VANSE		African Wattled Plover - <i>Vanellus senegallus</i>	CIRPY		Montagu's Harrier - <i>Circus pygargus</i>
PLUSQ		Grey Plover - <i>Pluvialis squatarola</i>	ASICA		African Marsh Owl - <i>Asio capensis</i>
CHAHI		Ringed Plover - <i>Charadrius hiaticula</i>			
CHADU		Little Ringed Plover - <i>Charadrius dubius</i>	Total		ADDITIONAL SPECIES (use extra sheet if needed)

CHAPE	_____	Kittlitz's Sandplover - <i>Charadrius pecuarius</i>	_____	_____
CHATR	_____	Three-banded Plover - <i>Charadrius tricollaris</i>	TOTALS:	BIRDS of _____ SPECIES