

WATERBIRD SURVEY **IN THE WETLANDS OF** **SOUTH-BENIN** **1996 AND 1997**



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**Sovon-onderzoeksrapport
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Waterbird survey in the wetlands of South Benin, 1996 and 1997

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For Eco-operation and the
Centre Beninois pour le Developpement Durable
(CBDD)

Colophon

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Large cover photo: Typical landscape of the wetlands of Southern Benin, of crucial importance for both wetland birds and people (Martin Poot)

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This report has been mainly written in 1997, and stayed as an arrested draft for 20 years until it was finalised in April 2019. The main information and general set up of the draft has not been changed, therefore the original publication year and report number has been kept.

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1. Introduction

The wetlands areas of Benin, like those of many other countries in Africa, Asia and South and Central America harbour natural resources that remain unknown until now. Wetlands have long been considered of little value and source of disasters and diseases. With increasing scientific and technical knowledge, these zones have become appreciated as sources of high economical and socio-economical value.

In the context of the bilateral agreement between Benin (and other countries) and The Netherlands, aiming at the prevention of a further decrease of the biodiversity in these countries, a sustainable development plan for the wetlands of Benin will be worked out. In line with this initiative an ornithological survey was organised in the wetlands of South Benin, as a part of “la Formulation du Programme d’Aménagement des Zones Humides”. This management plan envisages to help the local population to control the exploitation of their natural resources and to protect their environment in order to achieve a sustainable development.

Bird study has a good track of history in The Netherlands and birds are commonly believed to be good indicators for environmental quality of the wider countryside in general and certain habitat types (including wetlands) in particular. Setting up bird census work and bird studies in Benin is therefore seen as an important part of the efforts in the framework of the bilateral agreement between Benin and The Netherlands.

This first survey took place in February and the first decade of March 1996 (04-02 until 14-03). It was organised and lead by SOVON Birdcensus Work The Netherlands. As a consequence of this work an NGO was set up to facilitate the follow up of ornitholog-

ical work in Benin. This NGO is called ‘Centre de Recherche Ornithologique et de l’environnement’ (CEROE).

The survey in 1996 was followed up by a survey in March 1997, again organised and lead by Sovon, now in cooperation with CEROE.

The goals of the survey were:

- prospection of the ecosystems in South-Benin, as defined in the framework of the management plan.
- identification of the sites with the highest interest for birds, both local/resident African- and migratory species.
- identification of the threats posed to (the birds in) these ecosystems.
- identification of possible projects of conservation and further study for the near future.

Many waterbirds breed in northern countries and stage the non-breeding season in Africa. Their migration routes to Africa can be divided into more or less clearly distinguishable ‘flyways’. Benin is located in the “catchment area” of the Mediterranean flyway but overlap with the East Atlantic flyway is most probable. The East Atlantic and Mediterranean flyways are used by c. eight million waders in total. It is not likely that birds using the East African flyway winter in Benin (Smit & Piersma 1989, Scott & Rose 1996, Rose & Scott 1997).

Hardly any data on wintering palearctic waterbirds are as yet available from Benin. For non-waterbirds the situation is not better: in general, little is known about the avifauna of Benin and little literature can be found: Brunel (1958), Holyoak & Seddon (1990), Verschuren (1988), Adjakpa, Libois *et al.* (1995).

2. General characteristics of Benin and of the wetlands in South-Benin

2.1. Some general information about Benin

The republic of Benin, a coastal country in West-Africa, occupies a territory of 114.763 km² (I.G.N.) between 6°20' and 12°30' Northern Latitude and 1°30' et 2°45' Eastern Longitude. At the second *Recensement General de la Population et de l'Habitat* (R.G.P.H.) in February 1992, Benin counted 4.915.555 inhabitants, resulting in an average density of 42.8 inhabitants per km² (I.N.S.A.E.). Bénin neighbours Togo in the West, Burkina-Fasso in the North-west, Niger in the North and Nigéria in the East.

Benin has a coastline of some 100 km, part of the 'Slave Coast', on the Bight of Benin, which is a part of the Gulf of Guinea. The coast is a straight sand-bar, pounded by heavy surf on the seaward side, and backed by lagoons and former shorelines on the landward side. Rivers flow into these lagoons, Lac Ahémé and Lac Nokoué being estuaries of Couffo and Ouémé respectively, two rivers whose seaward exits are obstructed by the sand-bar. The Ouémé river has a wide marshy delta north of Lac Nokoué. A lagoon waterway is navigable for barges to Lagos (Nigeria). Elsewhere the lagoons are backed by intensively farmed regions. Here the land rises to a plateau of about 800 m with fertile arable land (Altenburg 1987).

Over the roughly 700 km of distance over the N-S axis between Niger and the Atlantic Ocean, three climatic and biogeographical zones are crossed:

1. The Soudanese Savanes of North-Benin,
2. The Guinean Savanes of Central-Benin,
3. The 'Old Forest Region' of Lower-Benin.

The study region is completely found in the Old Forest Region.

2.2. Description of the study area

2.2.1. Localisation of the study area

The study area is located in South-Benin between 6°15' and 7°00' Northern Latitude. It is composed of several meridional wetland ecosystems ranging from the mouth of the River Mono at the Togolese border in the West to the marshes of Adjarra-Avrankou at the Nigerian border in the East. This region includes the departments of Mono, Atlantique, Ouémé and part of Zou.

In the framework of the management plan for sustainable development, the study area has been divided into nine ecosystems, grouped in four units, taking the geographical situation and ecological characteristics into account:

Unit 1: The valley and delta of the So, the Ouémé and the 'Lagunes Anciennes':

- River valley of the So and the Ouémé;
- The delta of the So and the Ouémé into Lac

Nokoué;

- Lac Nokoué;
- Lagunes Anciennes.

Unit 2: The valley of Couffo and Lac Ahémé, Aho and 'Lagune Côtière', seaboard and coastal waters:

- System of Aho, Lac Ahémé and Valley of Kouffo;
- Lagune Côtière;

Unit 3: The lower Mono valley.

Unit 4: Wetland zone of SE Benin near Porto Novo:

- Wetlands of Adjarra-Avrankou;
- Wetlands in the region of Kraké-Ekpè.

2.2.2. Climate

The wetlands of South-Benin know a tropical humid climate, characterised by the alternation of four clearly demarcated seasons:

- Major Rain Season March-June;
- Minor Dry Season July-August;
- Minor Rain Season September-October;
- Major Dry Season November-February.

The temperatures in the wetlands are typical for tropical humid climates: high, but not excessive, throughout the year, ranging relatively little. The annual mean of minima is 22-23°C and of maxima around 31-32°C. The annual mean is 27°C, with little thermal amplitude of around 5°C. Relative humidity is high (on average between 70 and 90%).

The pluviometer shows much more variation in precipitation throughout the year, making it the most determining climatic factor, with a major influence on vegetation and fauna elements.

The annual mean totals are modest in general. They show a progressive decrease from East to West: Porto-Novo 1.374 mm; Allada 1.162 mm, Ouiday 1.050 mm and 843 mm at Grand-Popo.

2.2.3. Hydrology

South-Benin is intersected by several watercourses, running North-South (Ouémé, So, Mono, Kouffo, Sazué) and knows three major independent lagoon systems:

- a Western system, with a long extension running

eastward along the coast. It is subject to a strong maritime influence through one outlet into the sea at Bouche du Roy (Boca del Rio). It comprises three parts:

- Estuary of Mono and Sazué in the West;
- In the center: Lac Ahémé with its affluent Couffo and its effluent Aho
- In the East a long coastal lagoon, La Lagune Côtière, between Agoué and Togbin.
- a more restricted Central system, largely fed by continental affluent. It comprises waterbodies (Agbananou, Toho, Todouba, Dati, Ahouangan, Bakamè and Djonou) and marshes in the shape of the fingers of a glove between the former coastlines in the South and the plateau of Allada in the North.
- a Eastern system with a semi-seasonal balance between fresh and salt water. It includes Lac Nokoué and the lagoon of Porto-Novo, with the estuaries of Ouémé and So in the North and the outlet in the Channel of Cotonou and the Lagoon of Badagy (Nigéria) (Nigéria) in the South and South-East. South-Benin is based on a geographic substratum of relatively flat topography with plateau's of moderate altitude.

2.2.4. Relief and Soils

Three major géomorphological entities define the soils in the study area:

- the major continental plateau's with ferralitic soils, slightly desaturated and depleted (Terre de Barre).
- the sandy coastline composed of detritious quarternary sand formations.
- the alluvial plains, composed of recent detritious formations. Those are found in the estuaries of the major feeding rivers of the lagoon systems (Couffo, So and Ouémé). These contain soils with hydromorph mineral clay, hydromorph humiferous clay rich in organic matter and halomorph soils with hydromorph tendency.

2.2.5. Vegetation

The wetlands of South-Benin are covered with several types of vegetation, depending on the hydrolic regime of the region and on the waterlevel in the lagunes. One can distinguish:

- riverine formations of Ouémé, Mono and So, composed of pieces of semi-deciduous forest;
- mangroves (*Rhizophora*, *Avicennia*) along the lagunes on halomorph soils, influenced by the penetration of sea water through "Bouche du Roy"
- a mosaic of cultivated land and fallow land with a dominance of Oil Palm *Elaeis guineensis*
- low plains, periodically inundated and clearly influenced by brackish water, with a thick cover of the grass species Seashore Paspalum *Paspalum*

vaginatum, characterising the surroundings of Lac Nokoué, the lower delta of Aho, So and Ouémé and the south shore of the Lagune de Porto-Novo.

- *Typha australis* (*Typhaceae*) is found in the zones with the lowest salinity where fresh water enters Lac Nokoué, especially in the southwest corner where water from the Langune Anciennes enters the lake.
- classic vegetation of *Mariscus ligularis* and *Andropogon gayanus* found on the dry sandy hills.
- other not inundated zones have artificially been planted with Coconut *Cocos nucifera* and Oil Palm *Elaeis guineensis*. Remains of humid tropical semi-deciduous forest are found in places.



Mangroves (*Rhizophora*, *Avicennia*) along the large floodplains in the Aho delta with *Paspalum vaginatum* grass.

2.2.6. Human population

In 1996/1997 South-Benin harboured 50% of the Beninese population on 10% of the surface of the country's territory. The departments of Ouémé, Atlantique and Mono count 2.619.324 inhabitants (i.e. 53% of the total population of Benin (I.N.S.A.E. 1992)). The population density is very high.

The economy of the region is mainly based on agricultural activities and fisheries.



Temporarily floating fish trade market near Ganvie

3. Methodology and study area

In 1996 the project was carried out by Ward Hagemeyer, (Sovon), Jacques Adjakpa and Patient Coubéou, both Beninese consultants. In 1997 Martin Poot (Sovon) lead the survey in which Jacques Adjakpa, Etienne Ouikotan, Louis Lawouin, Gilbert Boko, Eliane Dossoumou and Joseph Adjassin (all CEROE) took part.



Members of the CEROE team

3.1. Methods and material

3.1.1. Set up field work 1996 and 1997

1996 was a pilot year to reconnaissance the areas and set up the surveys. With an idea of the terrain in mind and the maps at hand the fieldwork was started. Two phases can be discerned:

- The first phase (06 till 27 February 1996) consisted of an integral prospection of the wetlands in South-Benin. Birds were identified and quantified (if possible) and a general impression was obtained of the relative importance of the sites for birds.
- In the second phase (29/02 till 14/03/1996), following an evaluation of the results of the first phase, the most interesting sites have been visited again, to improve the data for these sites and to obtain more information from the population (threats to birds, like hunting, disturbance etc.). The sites were more intensively counted and the role of the site for the birds was assessed.

1997 was a follow up year. In 1997 the sites that were selected in 1996, based on the occurrence of good numbers of birds and their relative importance, were visited again, and in addition some new sites were explored. The fieldwork was generally performed in the same way as in 1996, but the occasion was also used to introduce some new members of CEROE to bird census work. All observations were noted on

forms in the field with positions indicated by numbers on black and white copies of maps. Data were entered in a paradox database.

Given the goals of the census and the character of the mission it is a part of, most attention was paid to 'wetland birds'. The list was drawn up rather arbitrarily for the purpose of this project to reflect the group of species that was regularly seen when visiting the wetlands. This does not necessarily reflect the ecological dependence of the species on the wetlands. Bird species of the following families were recorded in both years systematically:

Grebes (*Podicipedidae*)
 Ibises and Spoonbills (*Threskiornithidae*)
 Storks (*Ciconiidae*)
 Hawks and Eagles (*Accipitridae*)
 Osprey (*Pandionidae*)
 Rails (*Rallidae*)
 Plovers (*Charadriidae*)
 Coursers and Pratincoles (*Glareolidae*)
 Stilts and Avocets (*Recurvirostridae*)
 Bee-eaters (*Meropidae*)
 Herons (*Ardeidae*)
 Cormorants (*Phalacrocoracidae*)
 Ducks, Geese and Swans (*Anatidae*)
 Caraca's and Falcons (*Falconidae*)
 Owls (*Strigidae*)
 Jacanas (*Jacanidae*)
 Sandpipers and allies (*Scolopacidae*)
 Gulls, Terns and Skimmers (*Laridae*)
 Kingfishers (*Alcedinidae*)

In general the wetlands were visited using boats, usually a piroque or other fisherman-boat with a motor (if available). A 4WD car was used for transport and if possible used to cover part of the areas for counting. At other places (floodplains, shorelines, islands and not-navigable waters) the prospection was done by foot. In many cases the help of local guides was asked. This proved to be very helpful.

All observations were recorded on tape and after the fieldwork, in the evening, transferred to count-forms and processed into a database (Paradox) on the computer. In principle this was done in Cotonou where all the nights were spent.

It had been envisaged to set up a mist netting site for bird ringing in 1996. Due to the enormous population density a suitable site was not found where the nets could be set up and left alone. Because time was not sufficient to set up the nets every day again, netting has only been done on two days. The site was not optimal and in total only five birds were caught



CEROE surveying the vast floodplains of the So with *Paspalum vaginatum*



Where possible a telescope was used to identify water-birds

(*Ceryle rudis*, *Tchagra minuta* (2 ex), *Pycnonotos barbatus* (2 ex)). The ringing will not be further discussed in this report.

The database was analysed to generate totals per species and other summarizing parameters. In 1997 a map was drawn using Atlas GIS and both this programme and the mapping programme Stipt (P. Frigge, National Reference Center for Nature Management, The Netherlands) were used to make the distribution maps. Later in 2019 these data were processed in R (R Core Team 2017), making the final tables, figures and distribution maps, using base R and tidyverse (Wickham 2017), the later including ggplot2 (Wickham 2009) for graphs and maps. For GIS data processing the package sp was used (Pebesma & Bivand 2005).

3.1.2. Material

Transport

- 4WD car (Toyota land runner diesel), provided by the Royal Dutch Embassy and skilfully driven by Antoine, the chauffeur;
- 2WD car (Peugeot 504 petrol);
- Motor boats (Petrol + Oil);
- Pirogues;

Optics

- Binoculars (Leica 10x42, Zeiss 10x40, Minolta 10x50 and other brands);
- Telescopes (Opholyth 30xWW + 20-60x80, Opholyth 20-60x60);

Other material

- Field guides and checklists (see list of references);
- Dictaphone (Sony, small tapes) and field notebooks;
- Laptop computer (Toshiba) with software.

3.1.3. Maps

In the preparation stage, before starting the field-work, the area was inspected using maps. The following maps were used:

Institut Geographique National (I.G.N.), Paris, 1/25.000:
 Abomey-Calavi, 1991, colour, NB-31-XV 1d 3-1
 Ouidah, 1991, colour, NB-31-XV 1c 1-2

I.G.N., Carte de l'Afrique de l'Ouest (Type Outre-mer); 1/50.000

Lomé 2d, 1968, colour, NB-31-XIV-2d
 Porto-Novo 1d, 1968, black & white, NB-31-XV-1d
 Porto-Novo 2c, 1968, black & white, NB-31-XV-2c
 Porto-Novo 3b, 1968, black & white, NB-31-XV-3b
 Porto-Novo 3d, 1963, colour, NB-31-XV-3d
 Porto-Novo 4a, 1968, black & white, NB-31-XV-4a

I.G.N., Carte régulière de l'Afrique de l'Ouest; 1/200.000

Lomé, 1969, black & white, NB-31-XIV
 Porto-Novo, 1968, black & white, NB-31-XV

I.G.N., Pays et villes du Monde: République du Bénin; IGN 3615; 1/600.000.

3.2. Censused area

The census effort in both years has mainly been concentrated in the units 1 (Ouémé valley, Ouémé delta, Lac Nokoué and 'Anciennes Lagunes') and 2 (Couffo valley, Lac Ahémé, Aho, 'Lagune Côtière') (see 2.1.1).

Unit 4 (marshes in SE Benin) has only partially been visited in both years. Security problems at the Nigerian border prevented the equip to visit the area of Adjarra-Avrakou in 1996. Unit 3 (Mono valley) was also only visited partially in both years (most western part in 1997).

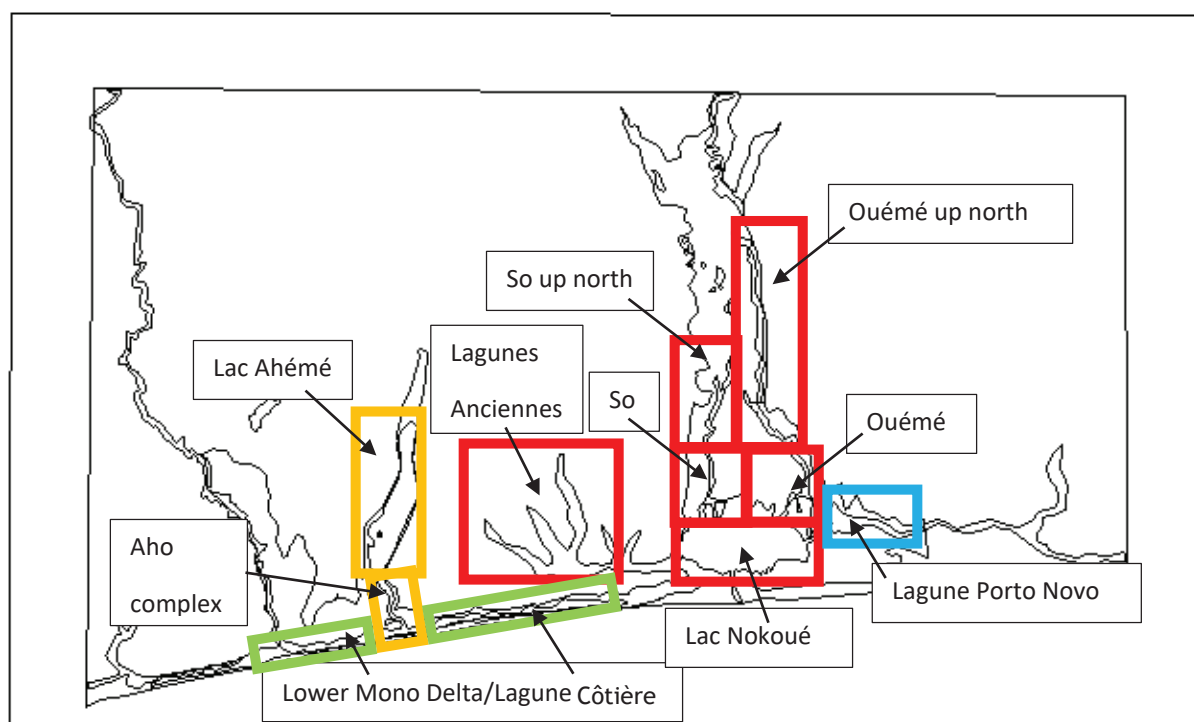


Figure 1. Count units and areas in the wetlands in Southern Benin in 1996 and 1997. Unit 1 = red (So up north, Ouémé up north, So, Ouémé, Lac Nokoué and Lagunes Anciennes), Unit 2 = yellow (Lac Ahémé and Aho complex), Unit 3 = green (Lower Mono Delta/Lagune Côtière), and Unit 4 = blue (Lagune Porto Novo).

In 1997 only a few kilometres of the southern parts of the rivers So and the Ouémé were visited, while in 1996 both rivers were covered far upstream. In 1997 only the southern tip of Lac Ahémé was covered from the shore with a telescope (because at the moment of the visit no boat was available), while in

1996 most of the lake was counted by boat.

In table 1 below the counting areas are given as used in this report to summarise the results. Also a summary is given of the differences in coverage between 1996 and 1997 of these areas.

Table 1. Count units in the wetlands in Southern Benin in 1996 and 1997, the dates of the visits, and a summary of the difference in coverage of these areas between the two years.

Units	area	1996	1997	Difference in coverage 1996-1997
Unit 1	So up north	05-03, 06-03	-	Only in 1996
Unit 1	Ouémé up north	15-02, 16-02	-	Only in 1996
Unit 1	So	09-02, 17-02	10-03, 11-03, 12-03, 18-03, 19-03	
Unit 1	Ouémé	14-02, 04-03	15-03	
Unit 1	Lac Nokoué	9-02, 12-02, 13-02, 14-02, 04-03	10-03, 11-03, 12-03, 15-03, 18-03, 19-03	
Unit 1	Lagunes Anciennes	19-02	16-03	Incomplete in 1997; only one branche
Unit 2	Lac Ahémé	20-02, 22-02	8-03, 13-03	Incomplete in both years; 1996 southern part with boat, northern part from the shore. 1997 only the southern part from the south shore with telescope.
Unit 2	Aho complex	20-02, 06-03	8-03	
Unit 3	Lower Mono Delta/Lagune Côtière	7-02, 20-02, 21-02, 23-02, 29-02, 06-03, 07-03, 08-03, 09-03	8-03, 16-03	Incomplete in 1997 (Lagune Côtière not by boat)
Unit 4	Lagune Porto Novo	12-02, 13-02, 14-02, 04-03	9-03, 20-03	Incomplete in both years (close to the Nigerian border)



Observations were noted on forms in the field with positions indicated by numbers in black and white copies of maps.

3.3. Description of the visited sites

Valley Of River Oueme

Located between the plain of Allada in the West and the Sakété and Pobè plains in the East and between the latitudes 6°35' and 7°00' North (including the rivers Ouémé and Zou). Sous-préfectures of Adjohoun, Bonou et Zè

- River Ouémé
Running North-South, river stretch between Bonou and Hêtin-Sota (explored by piroque between Hêtin and Adjohoun)
- Flood plains in the Ouémé river valley
Swamps, fields and marshes of the river plain
- River Sô
Running North-South parallel to river Ouémé. River stretch between Ahomè-Gblon and Togbota-Agué (explored by pirogue)
- Lakes Hlan, Newi and Tossahoué
Located at the NW limit of the Valley of Ouémé

Low Delta Of Oueme

Latitude Hêtin-Sota south until the coastline, including Lac Nokoué and Lagune de Porto-Novo. Sous-préfectures of So-Ava, Aguégoués, Porto-Novo, Abomey-Calavi and Dangbo.

- Lac Nokoué
Measuring 20 km (East-West) by 11 km (North-South)
Watersurface (at low water level) of 160 km², representing the largest lagoon-waterplain in Benin
- Lagune de Porto-Novo
The Lagune de Porto-Novo communicates permanently with Lac Nokoué by the channel of Totché and with the Sea by lagoon-channel of Nigeria running up to Lagos over a distance of 100 km
- Flood plains of the lower Ouémé delta
Surface : 9000 km² of the total of 50.000 km² for the whole of the Ouémé basin.
Heavily populated area

Lagunes Anciennes

Includes the lakes Toho and Todougba and are located 10 km NE of Ouidah. Lake Toho and Todougba are part of an a larger group of lakes called 'Lagunes en doigts de gant' (Glove lakes).

Their N limit is Sous-préfecture of Toribossito, their E limit Abomey-Calavi and the S limit the elevation of Pahou.

The Valley Of Couffo And Lac Ahémé, Aho

This area is bordered by the limit of the Mono Departmento and "l'Atlantique". This includes the wetland part of the delta of river Couffo (into Lac Ahémé), Lac Ahémé itself, River Aho and the marshy areas along the shores of Aho.

This extends from Tokpa Avagoudo in the North until Lagune Côtière in the South, passing Bokpa, Comè, Hèvè in the West and Sègbohoulé, Djègbadji et Djègbamè in the East.

Lac Ahémé is 24 km long (North-South) and has a width varying between 2 and 5 km, with a low level surface of 78 km², this being 100 km² in high water situations. Main influent comes from Couffo, though limited in volume.

Lagune Côtière And Coast Belt

The Lagune Côtière is a waterbody of 60 km length and a width of appr. 200 à 500 m, accounting for a watersurface (free surface) of about 12 km². This lagoon extends itself along the coast, from the mouth of River Mono (Bouches du Roy) at Agbanakin in the West until the village of Togbin, close to Cotonou, in the East. Near Djondji in the West the lagoon joins River Aho. A large number of sandbanks is found in the area between Grand Popo and Djondji. The salinity of the water towards the East is highest between Djondji and Togbin.

Wetland Zone In Se Benin (Ekpe)

This site is located between the interstate No 1, Cotonou-Lagos in the south and Lac Nokoué-Lagune de Porto Novo in the north with the city of Cotonou as western limit and the village of Djéffa as eastern limit. Due to security problems it was not possible to survey the area along the Nigerian border in 1996.

Lower Mono Delta

From the Bouches de Roy this site runs Westward along the river Mono to Grand Popo. Many sandbanks are found in the river here. The river was visited upstream from Grand Popo as well. Mangrove is found along the Mono and side branches, and along the Sazue river. This site includes the 'lilly ponds Bohe' situated W. of Comé.

4. Results

4.1. Recorded bird species in the visited ecosystems

A total of 84 bird species from the bird family list (see 3.1.2 above) have been recorded during the surveys in 1996 and 1997 (see table 2). In the appendices the results are presented per regional units and counting areas. For the comparison between the two years the numbers observed in the northern part of the rivers So and Ouémé only visited in 1996 are presented separately (table 2). In general the bird numbers were higher in 1997. Regarding the differences in counting effort between the two years, we refer to the discussion.

The 84 recorded species consist of 19 different bird families (indicated in table 2), which can be subdivided in 3 categories; 'true' wetland species (61), raptor species (15, including 1 owl species) and other

species (8), the latter category consisting of 4 kingfisher and 4 bee-eater species. In table 3 the total number of species per distinguished area are presented, with in table 4 a further characterisation of their avifauna in terms of numbers of species for the 19 different bird families. The percentages that have been calculated in the tables are related to the total number of recorded species or families recorded during both surveys in 1996 and 1997 together.

Based on number of species, the richest ecosystems for birds are, in order, Lac Nokoué, the So, Ouémé, Lower Mono Delta, Aho complex, Lagune Porto Novo, Lac Ahémé, Ouémé up north, So up north and last Lagunes Anciennes (table 3). When taking the number of recorded bird families, the order is Lac Nokoué, So, Lagune Porto Novo, Ouémé, Lower Mono Delta, So up north, Lac Ahémé, Aho complex, Ouémé up north and Lagunes Anciennes (table 4).

Table 2. All recorded 'wetland species' (see 3.1.2) and the totals that have been observed in 1996 and 1997. In 1996 the complete upper streams of the So and Ouémé were counted, but not visited in 1997, and are therefore presented separately ('additional areas 1996'). The coverage of the areas and the intensity of visits in 1997 were lower than in 1996. Also the timing of the counts were different (in 1997 later, only March) (see table 1).

Family	Species	1996	1997	additional areas 1996
Grebes (<i>Podicipedidae</i>)	Little Grebe - Grèbe castagneux - <i>Tachybaptus ruficollis</i>	0	1	0
Ducks, Geese and Swans (<i>Anatidae</i>)	White-faced Whistling Duck - Dendrocygne veuf - <i>Dendrocygna viduata</i>	3404	1118	0
Ducks, Geese and Swans (<i>Anatidae</i>)	Knob-billed Duck - Canard à bosse - <i>Sarkidiornis melanotos</i>	6	0	0
Storks (<i>Ciconiidae</i>)	African Openbill - Bec-ouvert africain - <i>Anastomus lamelligerus</i>	156	485	340
Ibises and Spoonbills (<i>Threskiornithidae</i>)	Glossy Ibis - Ibis falcinelle - <i>Plegadis falcinellus</i>	4	1	0
Herons (<i>Ardeidae</i>)	Striated Heron - Héron strié - <i>Butorides striata</i>	5	5	0
Herons (<i>Ardeidae</i>)	Squacco Heron - Crabier chevelu - <i>Ardeola ralloides</i>	169	417	22
Herons (<i>Ardeidae</i>)	Western Cattle Egret - Héron garde-boeufs - <i>Bubulcus ibis</i>	106	365	330
Herons (<i>Ardeidae</i>)	Grey Heron - Héron cendré - <i>Ardea cinerea</i>	99	93	1
Herons (<i>Ardeidae</i>)	Goliath Heron - Héron goliath - <i>Ardea goliath</i>	3	0	1
Herons (<i>Ardeidae</i>)	Purple Heron - Héron pourpré - <i>Ardea purpurea</i>	20	42	8
Herons (<i>Ardeidae</i>)	Intermediate Egret - Aigrette intermédiaire - <i>Egretta intermedia</i>	6	18	0
Herons (<i>Ardeidae</i>)	Western Reef Heron - Aigrette à gorge blanche - <i>Egretta gularis</i>	43	29	1
Herons (<i>Ardeidae</i>)	Little Egret - Aigrette garzette - <i>Egretta garzetta</i>	292	1682	1
Herons (<i>Ardeidae</i>)	Great Egret - Grande Aigrette - <i>Ardea alba</i>	78	464	5
Herons (<i>Ardeidae</i>)	Little Bittern - Blongios nain - <i>Ixobrychus minutus</i>	6	3	0
Herons (<i>Ardeidae</i>)	Eurasian Bittern - Butor étoilé - <i>Botaurus stellaris</i>	1	0	0
Herons (<i>Ardeidae</i>)	Black Heron - Aigrette ardoisée - <i>Egretta ardesiaca</i>	65	170	2
Herons (<i>Ardeidae</i>)	Hamerkop - Ombrette africaine - <i>Scopus umbretta</i>	1	0	0
Cormorants (<i>Phalacrocoracidae</i>)	Reed Cormorant - Cormoran africain - <i>Microcarbo africanus</i>	67	497	0
Rails (<i>Rallidae</i>)	Black Crake - Râle à bec jaune - <i>Amaurornis flavirostra</i>	41	28	0
Rails (<i>Rallidae</i>)	African Swampphen - Talève de Madagascar - <i>Porphyrio madagascariensis</i>	0	2	0
Rails (<i>Rallidae</i>)	Allen's Gallinule - Talève d'Allen - <i>Porphyrio alleni</i>	2	2	0
Rails (<i>Rallidae</i>)	Common Moorhen - Gallinule poule d'eau - <i>Gallinula chloropus</i>	0	1	0
Jacanas (<i>Jacaniidae</i>)	African Jacana - Jacana à poitrine dorée - <i>Actophilornis africanus</i>	68	420	34
Osprey (<i>Pandionidae</i>)	Western Osprey - Balbuzard pêcheur - <i>Pandion haliaetus</i>	1	11	1

Family	Species	1996	1997	additional areas 1996
Hawks and Eagles (Accipitridae)	Black-winged Kite - Élanion blanc - <i>Elanus caeruleus</i>	7	25	5
Hawks and Eagles (Accipitridae)	African Harrier-Hawk - Gymnogène d'Afrique - <i>Polyboroides typus</i>	2	2	2
Hawks and Eagles (Accipitridae)	Shikra - Épervier shikra - <i>Accipiter badius</i>	2	3	1
Hawks and Eagles (Accipitridae)	Gabar Goshawk - Autour gabar - <i>Micronisus gabar</i>	3	6	0
Hawks and Eagles (Accipitridae)	Western Marsh Harrier - Busard des roseaux - <i>Circus aeruginosus</i>	14	50	2
Hawks and Eagles (Accipitridae)	Montagu's Harrier - Busard cendré - <i>Circus pygargus</i>	4	8	0
Hawks and Eagles (Accipitridae)	Yellow-billed Kite - Milan noir d'Égypte - <i>Milvus aegyptius</i>	42	418	5
Hawks and Eagles (Accipitridae)	Lizard Buzzard - Autour unibande - <i>Kaupifalco monogrammicus</i>	1	2	4
Caraca's and Falcons (Falconidae)	Common Kestrel - Faucon crécerelle - <i>Falco tinnunculus</i>	2	1	0
Caraca's and Falcons (Falconidae)	Lanner Falcon - Faucon lanier - <i>Falco biarmicus</i>	2	4	1
Caraca's and Falcons (Falconidae)	Peregrine Falcon - Faucon pèlerin - <i>Falco peregrinus</i>	1	0	0
Caraca's and Falcons (Falconidae)	Grey Kestrel - Faucon ardoisé - <i>Falco ardosiaceus</i>	1	0	1
Caraca's and Falcons (Falconidae)	African Hobby - Faucon de Cuvier - <i>Falco cuvierii</i>	1	0	0
Owls (Strigidae)	Marsh Owl - Hibou du Cap - <i>Asio capensis</i>	1	1	0
Stilts and Avocets (Recurvirostridae)	Black-winged Stilt - Echasse blanche - <i>Himantopus himantopus</i>	366	777	12
Stilts and Avocets (Recurvirostridae)	Pied Avocet - Avocette élégante - <i>Recurvirostra avosetta</i>	30	3	0
Plovers (Charadriidae)	Spur-winged Lapwing - Vanneau éperonné - <i>Vanellus spinosus</i>	53	34	0
Plovers (Charadriidae)	Grey Plover - Pluvier argenté - <i>Pluvialis squatarola</i>	20	15	0
Plovers (Charadriidae)	Common Ringed Plover - Grand Gravelot - <i>Charadrius hiaticula</i>	41	69	1
Plovers (Charadriidae)	Forbes's Plover - Pluvier de Forbes - <i>Charadrius forbesi</i>	0	0	2
Plovers (Charadriidae)	Kittlitz's Plover - Gravelot pâtre - <i>Charadrius pecuarius</i>	0	1	0
Plovers (Charadriidae)	White-fronted Plover - Pluvier à front blanc - <i>Charadrius marginatus</i>	20	7	0
Couriers and Pratincoles (Glareolidae)	Collared Pratincole - Glaréole à collier - <i>Glareola pratincola</i>	61	115	425
Sandpipers and allies (Scolopacidae)	Eurasian Whimbrel - Courlis corlieu - <i>Numenius phaeopus</i>	97	61	0
Sandpipers and allies (Scolopacidae)	Eurasian Curlew - Courlis cendré - <i>Numenius arquata</i>	6	3	0
Sandpipers and allies (Scolopacidae)	Black-tailed Godwit - Barge à queue noire - <i>Limosa limosa</i>	47	55	0
Sandpipers and allies (Scolopacidae)	Ruff - Combattant varié - <i>Calidris pugnax</i>	4	142	0
Sandpipers and allies (Scolopacidae)	Little Stint - Bécasseau minute - <i>Calidris minuta</i>	17	58	0
Sandpipers and allies (Scolopacidae)	Curlew Sandpiper - Bécasseau cocorli - <i>Calidris ferruginea</i>	5	29	0
Sandpipers and allies (Scolopacidae)	Sanderling - Bécasseau sanderling - <i>Calidris alba</i>	18	12	0
Sandpipers and allies (Scolopacidae)	Common Snipe - Bécassine des marais - <i>Gallinago gallinago</i>	10	8	0
Sandpipers and allies (Scolopacidae)	Common Sandpiper - Chevalier guignette - <i>Actitis hypoleucos</i>	29	62	7
Sandpipers and allies (Scolopacidae)	Common Redshank - Chevalier gambette - <i>Tringa totanus</i>	8	5	0
Sandpipers and allies (Scolopacidae)	Marsh Sandpiper - Chevalier stagnatilis - <i>Tringa stagnatilis</i>	72	30	0
Sandpipers and allies (Scolopacidae)	Wood Sandpiper - Chevalier sylvain - <i>Tringa glareola</i>	368	1307	4
Sandpipers and allies (Scolopacidae)	Spotted Redshank - Chevalier arlequin - <i>Tringa erythropus</i>	74	119	0
Sandpipers and allies (Scolopacidae)	Common Greenshank - Chevalier aboyeur - <i>Tringa nebularia</i>	193	160	0
Sandpipers and allies (Scolopacidae)	Egyptian Plover - Pluvian fluviatile - <i>Pluvianus aegyptius</i>	0	3	15

Family	Species	1996	1997	additional areas 1996
Sandpipers and allies (<i>Scolopacidae</i>)	Green Sandpiper - Chevalier culblanc - <i>Tringa ochropus</i>	8	0	4
Sandpipers and allies (<i>Scolopacidae</i>)	Terek Sandpiper - Chevalier bargette - <i>Xenus cinereus</i>	0	1	0
Sandpipers and allies (<i>Scolopacidae</i>)	Ruddy Turnstone - Tournepiere à collier - <i>Arenaria interpres</i>	2	2	0
Gulls, Terns and Skimmers (<i>Laridae</i>)	Lesser Black-backed Gull - Goéland brun - <i>Larus fuscus</i>	0	4	0
Gulls, Terns and Skimmers (<i>Laridae</i>)	Caspian Tern - Sterne caspienne - <i>Hydroprogne caspia</i>	0	1	0
Gulls, Terns and Skimmers (<i>Laridae</i>)	Royal Tern - Sterne royale - <i>Thalasseus maximus</i>	221	122	0
Gulls, Terns and Skimmers (<i>Laridae</i>)	Sandwich Tern - Sterne caugek - <i>Thalasseus sandvicensis</i>	35	158	0
Gulls, Terns and Skimmers (<i>Laridae</i>)	Gull-billed Tern - Sterne hansel - <i>Gelochelidon nilotica</i>	2	1	0
Gulls, Terns and Skimmers (<i>Laridae</i>)	Common Tern - Sterne pierregarin - <i>Sterna hirundo</i>	26	0	0
Gulls, Terns and Skimmers (<i>Laridae</i>)	Whiskered Tern - Guifette moustac - <i>Chlidonias hybrida</i>	33	326	0
Gulls, Terns and Skimmers (<i>Laridae</i>)	Black Tern - Guifette noire - <i>Chlidonias niger</i>	1172	3393	0
Gulls, Terns and Skimmers (<i>Laridae</i>)	White-winged Tern - Guifette leucoptère - <i>Chlidonias leucopterus</i>	6	1	1
Kingfishers (<i>Alcedinidae</i>)	Grey-headed Kingfisher - Martin-chasseur à tête grise - <i>Halcyon leucocephala</i>	8	0	8
Kingfishers (<i>Alcedinidae</i>)	Woodland Kingfisher - Martin-chasseur du Sénégal - <i>Halcyon senegalensis</i>	7	49	6
Kingfishers (<i>Alcedinidae</i>)	Malachite Kingfisher - Martin-pêcheur huppé - <i>Corythornis cristatus</i>	22	61	13
Kingfishers (<i>Alcedinidae</i>)	Pied Kingfisher - Martin-pêcheur pie - <i>Ceryle rudis</i>	70	354	7
Bee-eaters (<i>Meropidae</i>)	White-throated Bee-eater - Guêpier à gorge blanche - <i>Merops albicollis</i>	8	78	59
Bee-eaters (<i>Meropidae</i>)	Rosy Bee-eater - Guêpier gris-rose - <i>Merops malimbicus</i>	0	8	1
Bee-eaters (<i>Meropidae</i>)	Little Bee-eater - Guêpier nain - <i>Merops pusillus</i>	0	2	2
Bee-eaters (<i>Meropidae</i>)	Northern Carmine Bee-eater - Guêpier écarlate - <i>Merops nubicus</i>	11	46	12

Table 3: Number of species and percentage of species recorded per site in both 1996 and 1997 data combined.

Units	area	n species	% species
Unit 1	So up north	24	29 %
Unit 1	Ouémé up north	26	31 %
Unit 1	So	54	64 %
Unit 1	Ouémé	50	60 %
Unit 1	Lac Nokoué	54	64 %
Unit 1	Lagunes Anciennes	17	20 %
Unit 2	Lac Ahémé	36	43 %
Unit 2	Aho complex	38	45 %
Unit 3	Lower Mono Delta	39	46 %
Unit 4	Lagune Porto Novo	37	44 %

4.2. Important habitats for birds

The wetlands of South-Benin include a number of habitats that have been found to be of importance for birds.

Lakes, watercourses, floating vegetation and marshes

This habitat is well represented in South-Benin and

harbours a varied aquatic avifauna: herons, egrets, ducks cormorants, waders, rails, terns and kingfishers. Next to this many swallows and other insectivorous birds can be found.

Swamp- and riverine forests

This habitat is found in the valley and lower delta of Ouémé, where it usually is degraded, *Raphia hookeri* becoming more and more dominant. Herons and

larger raptors find breeding places in these forest, which also harbour many species of smaller birds. The *Raphia* trees often contain colonies of weavers, usually mixed breeding of *Ploceus cucullatus* and *P. nigerrimus*.

Flood-plains

These plains occupy a large part of the territories in the study area. Their avifauna is obviously heavily influenced by seasonal flooding. During the dry season they harbour species like storks, pratincoles, herons, waders and raptors. In many of the areas being intersected by small watercourses the variety of species is even higher. In the brackish *Paspalum* plains, with here and there some water, herons, waders, raptors and bee-eaters can be found as the most representative species.

Mangroves

Many species of wetland birds have been found in and around the mangrove areas. This typically includes herons, waders, kingfishers and bee-eaters. Mangroves can be important for resting and roosting and potentially also as breeding sites for birds, but due to the inaccessibility of the habitat this is difficult to evaluate.

There is also a range of drier habitats that include:

Savannas

These dryer habitats usually harbour fewer wetland birds than the habitats described above but still have an important value for other bird groups. These have not been counted and visiting this habitat type was not prioritised.

Plantations

Though less typical for wetlands and quite different from the natural habitats, the plantations do harbour several interesting species, like woodpeckers, hornbills and raptors. Not prioritised and not counted.

Inhabited areas, settlements

The size and scale of the typical settlement in the wetland zone make that a specific group of birds can be found there, although pressure of hunting and disturbance is often high. Typical species include doves and weavers, but often also waders can be found foraging on water edges near settlements. The city of Cotonou is large and hectic. Green elements like parks and gardens provide suitable habitat for many bird species. Even in areas without gardens single trees can harbour weavers, bulbuls, sparrows and even kestrels. Waterbirds can often be seen along the outlet channel of Lac Nokoué (Lagune de Cotonou), close to the centre of the city.

4.3. Species accounts

From the data gathered during the surveys in 1996 and 1997 on birds in the wetlands of Southern Benin some general patterns in abundance, distribution and feeding ecology emerge. For a selection of characteristic wetland species accounts are made. Distribution maps of all recorded species are presented in the appendices. With respect to comparisons between the two years one should bear in mind that the coverage in 1997 was less than in 1996 and that the timing was different (table 1). The list with all observed species and their totals is presented in table 2. A table with all recorded numbers per species per counting area can be found in the appendices.

For every species the scientific name, the French name and English name is given.

Microcarbo africanus - Cormoran africain/ Reed Cormorant

Reed Cormorants are most numerous on the north side of Lac Nokoué. Flocks of more than 10 birds can be seen here, using Akadja structures as roosting sites.

Birds spread during the day and feed solitary, while during roosting small aggregations occur. The biggest flocks were observed during the morning and evening. Solitary birds and small flocks could also be found in the rivers SO and Oueme.



A Reed Cormorant *Microcarbo africanus*

Foraging flights were observed. On 10 March during the visit of the west part of Lac Nokoué in the morning several small flocks were seen heading to NE, indicating that a relatively high number of birds is present in the west part of Lac Nokoué as was found in 1996. On 18 March the area was visited again and just south of Abomey Calavi a night roost of Reed Cormorants was discovered. Flights of mostly solitary birds and small flocks were NE and E directed, respectively to the floodplain in order to redistribute

themselves over the numerous channels of the river So and the lake itself in the east. Around 8.25 hour the roost still contained a minimum of 110 birds resting in a dense Akadja structure of palm leaves. The total of cormorants in this area was estimated to be 300 birds.

Ixobrychus minutus - Butor Blongios/ Little Bittern
Only 3 observations were made of this species, but it is likely much more common. Two birds were found in a small marsh in a dead arm of the So near Togbota Ague, 1 bird near Porto Novo and 1 bird in Lagune Côtère, the only observation in brackish habitat. The occurrence of this species is probably mostly restricted to fresh water marsh. Little Bittern is a very secretive bird. Special attention by counts during sunset or systematic entrance of suitable habit to disturb the birds could perhaps reveal more information on this species.

Butorides striatus - Héron à dos vert/ Green Backed Heron

A secretive but common species which has been observed only relatively few times. This species is an sedentary equivalent of the Little Bittern, but it's occurrence is mainly restricted to the salty mangrove habitat, with relatively many observations in the Lagune Côtère.

Ardeola ralloides - Héron Crabier/ Squacco Heron
In comparison to 1996 more Squacco Herons were found during the counts of 1997. The general higher water table must have caused a higher food availability for this fish eating birds, as also higher numbers of other piscivorous species were observed. Remarkable was the high density of birds in the west part of Lagune de Porto Novo. In 1996 here also the highest concentration of birds was found. Flocks of more than 30 birds can be seen here. The floating vegetation in recently set up Akadja is apparently a rich habitat with high food availability. The birds are hard to discover because of their excellent camouflage when bent down through the knees waiting for prey.

Bubulcus ibis - Héron Garde-boeuf/ Cattle Egret
As the name suggests the occurrence of this species is related to cattle. The distribution shows a strong correlation with the distribution of the human settlements and accompanying cattle in the area. Most birds have actually been observed near the presence of villages and cattle, where the birds were found in grasslands feeding on insects and other small prey.

Egretta ardesiaca - Héron Noir/ Black Heron
One of the spectacular African heron species is the Black Heron. This species is rather rare in West

Africa, with Ghana on the most western border of its distribution range. Most birds were found on the north side of Lac Nokoué. In comparison to 1996 a much higher number of birds were observed in this area. Since no visit was conducted to the west side of the lake it remains unclear whether in general higher numbers were present or that a redistribution of birds has taken place. The first seems most reasonable as also higher numbers of other piscivorous species were found.

The birds are restricted to shallow waters to perform their special feeding technique using its wings to form a canopy. In the wetlands of southern Benin this species finds suitable feeding areas also at floating vegetation where they gather in semi-social aggregations to forage on probable small fish hiding under the vegetation.



Flock of resting Black Herons *Egretta ardesiaca*

Egretta gularis - Aigrette Dimorphe/ Reef Heron
This species is closely related to the Little Egret, but the Reef Heron shows a much more restricted distribution in the wetlands of South Benin. While the largest concentrations of Little Egrets were found in the northern parts of Lac Nokoué, Reef Herons seems to occur more near the coast. This could indicate a distinction in preference in salinity between the 2 species. In 1996 no indication as such could be found, but the numbers were considerable lower then.

Egretta garzetta - Aigrette garzette/ Little Egret
Besides the Black Tern this is one of the main indicator species for availability of prey items in the coastal wetlands. As such this is one of the species that would be desirable to include in annual monitoring efforts. The birds are conspicuous and relatively easy to count in an integral way in wetland habitats. Largest concentrations are found on the north side of the lake of Lac Nokoué. Along the edge of the lake largest flocks were found, probably due to a combination of presence and availability of high numbers



Flock of Little Egrets Egretta garzetta clearly taking advantage of the fishing activity by humans.

of fish of small size classes. The birds are wading in the water or use the available Akadja constructions as a perch to hunt for prey.

The birds definitely take advantage of the fishing activity by humans. During catching sessions in Akadja the birds gather around the constructions were nets have been put up. Birds are balancing on the nets and sticks to catch the small fish, which become available as they have been drifted to the water surface due to catching activities of local fisherfolk.

Egretta Intermedia - Aigrette intermédiaire/
Yellow-billed Egret

Both in 1996 and 1997 most birds were found on the marshy shores of lagune de Porto Novo and the Ouémé near the Nigerian border. As in other species the numbers were higher in 1997 than in 1996. Contrary to the Great White Egret the birds mostly stand and wade along the edges of the water or make use of the floating vegetation, when foraging.



Intermediate Egret Egretta Intermedia foraging on floating dying Water Hyacinth Eichhornia crassipes, one resting Little Egret Egretta garzetta and several Squacco Herons Ardeola ralloides (the ones in the vegetation not well visible because of their camouflage)

Egretta alba - Grande Aigrette/ Great White Egret
In 1997 several concentrations of more than 50 birds were found on the marshy shores of Lac Nokoué, lagune de Porto Novo and the Ouémé near the Nigerian border. Probably at these sites most favourably feeding conditions occurred; a combination of high availability of fish and not too deep water. Clearly these conditions in 1997 must have been much better than in 1996 as the numbers were considerably higher than in 1996.

As in other piscivorous species remarkable differences occur in the distribution pattern in the two years. Water depth is probably an important aspect of food availability for this species, as the birds mostly stand and wade through the water, sometimes belly deep, when foraging. When foraging in flocks individuals are more or less evenly distributed, probably in order to avoid interference while foraging in the typically 'stay and wait' manner.

Ardea purpurea - Héron pourpré/ Purple Heron
Although this species regularly can be seen flying above the marshes of the floodplains, the numbers recorded reflect likely only a small fraction of the real population present.



Resting flock of African Open Billed Stork Anastomus lamelligerus with a flock of resting Great White Egrets Egretta alba in the background.

Anastomus lamelligerus - Bec ouvert/ African Open Billed Stork

These big birds never have been observed foraging during the counts. The birds probably feed at night. The concentrations found at the north side of Lac Nokoué were very difficult to reach, because the water surrounding the marsh were the birds were roosting was very shallow and therefore not easy to access by boat. The birds were obviously very shy and easily flushed when approached.



A flock of African Open Billed Stork *Anastomus lamelligerus*



An Osprey *Pandion haliaetus* with a prey fish at an Akadja stick

Dendrocygna viduata - Dendrocygne Veuf/ White faced Tree-duck

Biggest concentrations were found on the northern edge of Lac Nokoué en in the Ouémé river close to the border with Nigeria. The elusive behaviour of the flocks indicates that this species suffer or have suffered from heavy hunting pressure. The birds were mostly seen resting or flying around when disturbed. Probably the birds mainly forage at night. In this respect the question might be raised whether quiet roosting sites for large numbers of White-faced Whistling-ducks could be limited in the wetlands of South-Benin. Also unknown at the moment is whether high numbers were or can be present in the central parts of the flood plain between the rivers So and Ouémé.



White faced whistling-ducks *Dendrocygna viduata* rest during the day. The species forage mainly at night and fly to foraging areas elsewhere during dusk

Pandion haliaetus - Balbuzard pêcheur/ Osprey

Several observations were made of this big fish-eater. We think it is possible that we saw the same individuals at different locations. Several birds appeared to be successful, carrying or eating fish on their perch in Akadja.

Elanus caeruleus - Elanion Blanc/ Black Shouldered Kite

These birds were regularly observed in the dryer parts within the wetlands of southern Benin, as their main prey consists of small lizards. The birds can sometimes be seen hovering above the floodplains, but probably due to the harsh heat of the dry season the birds are more commonly seen perching in palm trees or other high posts to look out for prey.

Milvus aegyptius - Milan noir d’Egypte/ Yellow-billed Kite

The species is a real scavenger, looking out for dead prey like floating dead fish and wounded and killed animals along roads, but also trash on rubbish dumps. Although the species is common along roads and near human settlements, this bird can be truly regarded as a indicator species for wetlands. The species may passively profit from the fishing activities by the human population by scavenging on the killed fish during the fishing process.

Circus aeruginosus - Busard des Roseaux/ European Marsh Harrier

The floodplains north of Lac Nokoué hold a considerable population of European Marsh Harriers. During the day several individuals can be observed hunting above the marshes, but the question remains which proportion of the population actually present has been counted. During the early morning on the 10th of March several Marsh Harriers concentrated on the western banks of Lac Nokoué, probably a local communal night roost. Perhaps in future some effort could be put in finding the night roosts of these birds to be able to get a more precise estimate of the total population present.

Amaurornis flavirostra - Marouette Noire/ Black Crane

Although low numbers have been observed in 1996 and 1997, a difference in distribution pattern is evident. In 1997 most birds were found in the marshy areas along the northern shores of Lac Nokoué and Lagune de Porto Novo. These areas were also visited in 1996, but hardly any birds were discovered then. It is likely that also this species reacts strongly on water table differences.

Actophilornis africana - Jacana/ Lily-trotter

Slightly higher number of birds recorded in 1997 compared to the 1996 results. The birds turned out to be remarkably shy. The birds are easily disturbed when approached and flee already at a great distance. This behaviour probably indicates that the species is being hunted.



Shy behaviour of Jacana's, flying up at a relatively large distance, indicating that the species was hunted in some areas

Himantopus himantopus - Echasse Blanche/ Black-winged Stilt

Largest concentrations in 1997 were found on the north side of the lake of Lac Nokoué and not in the very southwest corner of Lac Nokoué as in 1996. As in Wood Sandpipers *Tringa glareola*, substantial numbers were seen foraging on the floating mats of Water Hyacinth **Eichhornia crassipes** and other floating water vegetation. It is likely that the birds find food here. Especially in the channels of the So and in the marshy vegetation along the Ouémé east of Porto Novo flocks of several tens were seen foraging on prey present under and on the floating vegetation.

In both years substantial numbers were found in the shallow waters along the southern edges of Lac Ahémé. Here individual birds were also seen in mixed flocks of foraging Marsh Sandpipers *Tringa stagnatilis* and Spotted Redshanks *Tringa erythropus*, feeding socially on schools of small fish.



Also Black-winged Stilts Himantopus himantopus were foraging on small prey in or under the floating mats of dying Water Hyacinth Eichhornia crassipes

Recurvirostra avosetta - Avocette d'Europe/ Avocet

In both 1996 and 1997 a small flock of Avocets were observed on the southern edge of Lac Ahémé. Here shallow water and mudflats occur, suitable habitat for this species. In 1997 a flock of 3 birds was observed actively foraging on small fish in a social foraging aggregation of Marsh Sandpipers *Tringa stagnatilis*, Greenshanks *Tringa nebularia* and Spotted-Redshanks *Tringa erythropus*.

Glaucopis pratensis - Glaréole à Collier/ Collared Pratincole

The Collared Pratincole is an aerial forager. In this survey the species was mostly seen hunting on flying insects above the wide flood plains of the rivers So and Ouémé. During the daytime sometimes birds were seen foraging at very high altitude (soaring on thermals). Other flocks were seen foraging very low over the ground around fires where large numbers of insects became available while fleeing for the fire. Along the Ouémé flocks of birds were seen flying to the river to drink water and returning inland afterwards. These observations indicate that coincidence played a role in the actual numbers encountered during the counts and give some insight in the ecology of this species in the wetlands of southern Benin. Clear is that the species occurs in a much wider area than the water rich habitat mainly surveyed in this study. This implies that the numbers of birds counted in both years probably only reflect a small portion of the total population present since no special attention was paid to the extensive areas of floodplains and fields.

Limosa limosa - Barge à Queue Noire/ Black-tailed Godwit

In both 1996 and 1997 comparable small numbers of Black-tailed Godwits were observed on the southern edge of Lac Ahémé. Here shallow water and mudflats

occur, suitable habitat for this species.

Numenius phaeopus - Courlis Corlieu/ Whimbrel

The highest numbers were found on the mudflats and shores in the Mono delta. Here the species finds high food availability in fiddler crab *Uca tangeri* populations inhabiting the small mudflats. An alternative food source are the ghost crab *Ocypode africana* populations on the shores, where also some birds were seen. Unclear is what the birds are feeding on which are present at Lac Nokoué. It could be that they also feed on crabs here, but alternative food sources are also possible (dead fish or insects?).

Tringa stagnatilis - Chevalier stagnatile/ Marsh Sandpiper

Marsh Sandpipers were seen in mixed flocks of foraging Spotted redshanks *Tringa erythropus* and Greenshanks *Tringa nebularia*. The birds forage socially on schools of small fish in the shallow waters at the southern edges of Lac Ahémé.



A dense social flock of Marsh Sandpipers *Tringa stagnatilis* foraging mixed with also some Spotted redshanks *Tringa erythropus* and Greenshanks *Tringa nebularia*, probably feeding on small fish

Tringa nebularia - Chevalier Aboyeur/ Greenshank

This species was seen in mixed flocks of foraging Marsh Sandpipers *Tringa stagnatilis* and Spotted redshanks *Tringa erythropus*. The birds forage socially on schools of small fish in the shallow waters at the southern edges of Lac Ahémé.

Tringa glareola - Chevalier Sylvain/ Wood Sandpiper

The Wood Sandpiper was the most numerous wader in 1997 in the wetlands of southern Benin (almost 1400 in total). Although limited, some mudflats are available along the edges of Lac Nokoué and Lac Ahémé. Nevertheless, Wood Sandpipers were mostly seen on the floating mats of Water Hyacinth *Eichhornia crassipes*. Especially in the channels



A more open social flock of Greenshanks *Tringa nebularia* foraging mixed with some Little Egrets *Egretta garzetta* and Black-winged Stilts *Himantopus himantopus*, probably also feeding on small fish

of the So north of Lac Nokoué flocks of several tens were seen foraging on prey present under and on the floating vegetation. Also flocks of Black-winged stilts *Himantopus himantopus* and Ruff *Philomachus pugnax* were found here. At first sight it is likely to assume that the birds forage mainly on insects here, but still it might not be ruled out that birds catch small fish here as well. Wood Sandpipers foraging on floating mats of water hyacinth were mostly discovered only when the boat with observers chased the birds, indicating that likely a considerable number might be overlooked.

Besides birds are missed foraging on the floating mats of Water Hyacinth *Eichhornia crassipes*, the wide floodplains of the rivers So and Ouémé probably also hold high numbers of Wood Sandpipers. Regularly small flocks of waders were seen flying over the wide floodplains. In the floodplains many small mudflat stretches and small ponds were



Several Wood Sandpipers *Tringa glareola* foraging on the floating mats of dying Water Hyacinth *Eichhornia crassipes*. Flocks of tens of birds can easily be overlooked in this type of vegetation.

present which were not surveyed. Especially in the floodplains at the west side of Lac Nokoué and the western floodplains of the river So probably many unseen waders were present. Also on the floodplains along the Aho and wide plains south and west of Lac Ahémé considerable numbers of Wood Sandpipers and other waders must have been present. All these areas could not be visited properly because of limited time. A special sample counting method (transects) is needed to monitor the numbers of waders present in these areas, especially species like the Wood Sandpiper, Snipe and Great Snipe that do not show strong grouping behaviour and can be found anywhere in small numbers.

Tringa hypoleucos - Chevalier Guignette/ Common Sandpiper

Like the Whimbrel *Numenius phaeopus* this species is a food specialist of crabs (in areas where crabs are available). Since the Common Sandpiper is a small bird it consequently feeds on the smaller size classes of crabs. In 1996 the highest numbers were found on the mudflats and shores in the Mono delta and Lagune Côtière. Here the species finds high food availability in fiddler crab *Uca tangeri* populations inhabiting the small mudflats. Also for this species an alternative food source are the (young) individuals of the ghost crab *Ocypode africana* on the shores. In 1997 Common Sandpipers were only found in a few locations in the Mono delta, probably as an effect of the limited availability of muddy edges due to the higher water level in comparison to 1996. In 1997 also more sandpipers were found along the edges of Lac Nokoué and also along the river Ouémé. Here the sandpipers feed on insects.

Calidris ferruginea - Bécasseau Cocorli/ Curlew Sandpiper

In both 1996 and 1997 this species was only observed on the mudflats at the southern edge of Lac Ahémé, the locations in the wetlands of southern Benin where the mudflats occur with the finest sediment. This substrate probably holds slim worms, suitable prey for Curlew Sandpipers.

Calidris minuta - Bécasseau Minute/ Little Stint
Small numbers of Little Stints were found on the mudflats at the southern edge of Lac Ahémé, both in 1996 and 1997. In 1996 also some birds were found outside Lac Ahémé, in the Mono delta.

Philomachus pugnax - Chevalier Combattant/ Ruff
In 1997 a couple of flocks of Ruff were found on the floating mats of Water Hyacinth *Eichhornia crassipes* in the channels of the So at north side of Lac Nokoué. The Ruff were found here with a couple of hundred of Wood Sandpipers *Tringa glareola*

and considerable numbers of Black-winged stilts *Himantopus himantopus*. Ruffs are in principal typical insect eaters. Therefore it is reasonable to assume that both Ruff and, for the time being, also other birds mainly feed on insects on the floating vegetation.

Hoploterus spinosus - Vanneau Armé/ Spurwinged Plover

This species occurs widespread through the area. Observations done during the counts indicates the species eats insects along the water edges and on the dryer parts in the wetlands of southern Benin.

Pluvialis squatarola - Pluvier Argenté/ Grey Plover

Almost all observations were done in the Mono delta. In this area mudflats occur with considerable populations of worms, preferred prey of this species. In 1997 concentrations of Grey Plover never amounted more than 3 birds.

The only bird observed outside the Mono delta was seen on the northern edge of Lac Nokoué, a strange place, since no mudflats occur here. The bird was found on the edge of the marshy vegetation along the lake. Remarkable is that in 1996 in the same area also 1 bird was observed.

The lack of observations of this species on the southern mudflats of Lac Ahémé in both years is striking, since other worm feeders as Curlew Sandpipers *Calidris ferruginea* are recorded here.

Charadrius hiaticula - Grand Gravelot/ Ringed Plover

In 1996 most birds were seen in the Mono delta. The species finds here suitable foraging sites; mudflats with worms, probably the main food item in Benin. Compared to 1996 the distribution in the Mono delta in 1997 was more restricted. This could be due to the higher water table, as a result of the available mudflat surface was more restricted here. In 1997 more birds were seen in Lac Nokoué and on the mudflats in the southern part of Lac Ahémé.

Charadrius marginatus - Gravelot à Front Blanc/ White-fronted Plover

In both years small numbers of White-fronted Plover were found on the mudflats in the Mono delta. As in Grey Plover and Ringed Plover in 1997 fewer birds and a more restricted distribution pattern was found here, which is probably caused by the higher water table in 1997.

Pluvianus aegyptius - Pluvian Fluviatile/ Egyptian Plover

Along the Ouémé in 1996 at several places Egyptian Plovers were present. In Ouémé sandy riches and small islands occur where the species finds suitable



The Egyptian Plover Pluvianus aegyptius is typical for the sandy banks of the Ouémé river

feeding and probably also suitable breeding habitat. Along the So in both 1996 and 1997 no Egyptian Plovers were found as this river is less wide and stretches of sandy shores and islands are lacking here. In 1997 only the southern half of the Ouémé has been surveyed in the wetland region of southern Benin.

Vanellus spinosus - Vanneau armé/ Spur-winged lapwing

This species occurs widespread through the area. Apparently the species can be opportunistic in its diet choice, as we noticed birds feeding regularly on small fish in the wetlands of southern Benin.

Chlidonias hybridus - Guifette Moustac/ Whiskered Tern

In between the large numbers of Black Tern also a considerable number of Whiskered Tern were found at the north side of Lac Nokoué. The numbers of Whiskered Tern in Lac Nokoué counted in 1997 exceeded the 1% criterion (Dodman *et al.* 1997), thereby Lac Nokoué might be identified as a wetland of international importance.



Whiskered Terns Chlidonias hybridus and a Whimbrel Numenius phaeopus

Chlidonias niger - Guifette noire/ Black Tern

Of special interest was the occurrence of almost 3,500 Black Terns in 1997. In 1996 fewer Black terns were present as was also found in other piscivorous bird species. The numbers of Black Tern in 1997 in Lac Nokoué solely exceeded the 1% criterion (Dodman *et al.* 1997), thereby Lac Nokoué might be identified as a wetland of international importance. Remarkable was that the Black Terns forage on the lakes Lac Nokoué and Lac Ahémé and not at sea at this time of the year. The birds forage on small prey (fish and/or shrimps). The birds commonly take advantage of the fishing activity by humans. During catching sessions of local fishermen the birds gather in concentrations above the Akadja constructions with fish nets. The birds fly actively around and dive regularly to catch small fish. The fish probably becomes more available because they are forced to the water surface by the nets, especially during the catching sessions by man.

The numbers actually present are probably higher than the recorded numbers during the counts. Besides the evident concentration of birds at the north side of Lac Nokoué in the Ganvie region the birds distribute over a wide area on the lakes during the daytime, which makes a complete count of the total population difficult. Moreover, only a tiny part of Lac Ahémé was counted from the south shore in the survey of 1997.

A good method for an assessment of the total population should be to count the birds in the evening when they concentrate on night roosts. Birds foraging on the lakes Lac Nokoué and Lac Ahémé could use Akadja constructions as roosting sites as seen in birds resting during the day. This was confirmed in a study on Lac Nokoué in the year 2000 (Hagemeijer & van der Winden, 2000).

Since the counts in both 1996 and 1997 were conducted in February/March, little is known yet of the numbers of birds in other months of the year (especially in the period October/November). Some coastal lagoons seem at first sight very suitable for roosts of sea-fishing terns as described for Ghana, especially the area around the Bouche de Roy. In order to check this area for a night roost of terns the estuary of the Mono should be visited around dawn.

Sterna maxima - Sterne Royale/ Royal Tern

Most Royal Terns observed in the wetlands of southern Benin were found close to the sea, where most birds normally find their food. Largest flock was found resting on a mudflat near Bouche de Roy, near the entrance to the sea. In 1996 most birds were also found in this area. Nevertheless, some Royal Terns also forage on the big lakes inland. In 1997 several tens of birds were found resting on sticks of Akadja



Flock of Royal Terns Sterna maxima with one Gull-billed Tern Gelocheidon nilotica on a mudflat near La Bouche du Roy

along the southeaster shore of Lac Nokoué, where birds were also seen foraging.

Gelochelidon nilotica - Sterne hansel/ Gull-billed Tern

Scarce species with only 2 individuals in 1996 in Lac Nokoué and 1 near La Bouche du Roy in 1997, the latter the place with many fiddler crabs as potential food.

Sterna sandvicensis - Sterne Caugek/ Sandwich Tern

In 1996 most Sandwich Terns were seen in a flock of Royal Terns resting on a mudflat near Bouche de Roy. The next year fewer birds were found here. Most birds in 1997 were seen on Lac Nokoué, both at the north side as well as along southeaster shore of Lac Nokoué.



White-winged Tern Chlidonias leucopterus with still some black lesser undercoverts.

Chlidonias leucopterus - Guifette Leucoptère/ White -winged Tern

Only 1 observation of a bird foraging in a channel at the north side of Lac Nokoué. This species is rare in

the wetlands of Southern Benin as its preferred winter habitat are fresh water wetlands.

Ceryle rudis - Martin-pêcheur Pie/ Pied Kingfisher

Many more Pied Kingfishers were seen in 1997 compared with 1996. In general this holds for all kingfisher species. As mentioned earlier in other piscivorous birds the water table in 1997 was higher than in 1996 and also had a strong effect on the numbers of this species group. Both in 1996 and 1997 relatively many Pied Kingfishers were found in the river mouth of the So, around Ganvie, and in the southeaster part of Lac Nokoué. Besides the numbers in these areas were higher in 1997, also the distribution in 1997 was much wider than in 1996. In 1997 also birds were found in Lac Ahémé, along the Aho and in the Mono delta, a region where remarkably in 1996 hardly no birds were found. Also many more birds were found along the shores of Lagune de Porto Novo and along the Ouémé east of Porto Novo.



Pied Kingfisher Ceryle rudis

Halcyon senegalensis - Martin-chasseur du Sénégal/ Senegal Kingfisher

H. leucocephala - Martin-chasseur à Tête Grise/ Grey-headed Kingfisher

These 2 species are grouped together because in 1997 the Grey-headed Kingfisher was not consciously recognized in the field. In general the numbers of these birds in 1997 were higher than in 1996, but the difference was not that remarkable as in the Pied Kingfisher *Ceryle rudis*. This might be explained by the fact that both species are less dependent on fish than the Pied Kingfisher *Ceryle rudis*.

Alcedo cristata - Martin-pêcheur Huppé/ Malachite Kingfisher

In 1997 the numbers of this species were higher, but not very much higher as in for instance the Pied Kingfisher. Malachite Kingfishers have a much restricted distribution pattern, because this species likes

to stay in the vicinity of vegetation bordering waters and avoids more or less wide open water.



Malachite Kingfisher Alcedo cristata

Merops nubicus - Guêpier Ecarlate/ Carmine Bee-eater

Both in 1996 and 1997 comparable numbers were found of the Carmine Bee-eater. In both years birds were seen in the channels of the river So in the floodplains north of Ganvie. The birds were feeding here on insects above the channels and adjacent meadows, using bamboo sticks of Akadja in the channels as perching sites.



Carmine Bee-eater Merops nubicus

Merops albicollis - Guêpier à Gorge Blanche/ White-throated Bee-eater

In 1996 a relatively large number of White-throated Bee-eaters was found along the upper part of the Ouémé, an area which was not visited in 1997. In 1997 small numbers of White-throated Bee-eaters were found along the northern shore of Lac Nokoué

and Lagune de Porto Novo and along the southern part of the Ouémé and the So, areas which were visited also in 1996, but where no birds of this species were observed then.

4.4. General characterization of the birds in the wetland of southern Benin

In general the most important group of the bird community in the coastal wetlands of Benin consists of medium-sized fish-eating birds, such as egrets, cormorants and terns. Most numerous heron species were Little Egret, Squacco Heron, Great Egret and Black Heron. In the bordering vegetation of the lagoons substantial numbers of Purple Heron were present, though likely only a small fraction was observed during the counts. The lakes and other inland waters are very rich in fish and shrimps, reflected by the large numbers of active fishermen and by the large surfaces of Akadja, constructions of palm-leaves and bamboo sticks for growing and catching fish. Some birds species clearly profit from the fishing activities of people, as concentrations of egrets and terns are present at Akadja stands where fish was trapped by nets. Of special interest was the occurrence of almost 3,500 Black Tern in 1997. These birds foraged in Lakes Nokoué and Ahémé and not at sea in this time of year.

4.5. Differences in occurrence of birds between 1996 and 1997

Overall, the numbers of fish-eating birds in 1997 were higher than in 1996 (table 4), probably due to the higher water table and consequently more food. Also some wader species were more numerous in 1997. The most numerous wader was the wood sandpiper (almost 1,400 in total in 1997), which was foraging on small prey present on and under the floating mats of water hyacinth. This exotic freshwa-



Mudflats near La Bouche du Roy full with West African Fiddler Crabs Uca tangeri.

Table 4: Total numbers per bird families recorded in 1996 and 1997 for the areas visited in both years.

Family	1996	1997
Grebes (<i>Podicipedidae</i>)	0	1
Ducks, Geese and Swans (<i>Anatidae</i>)	3410	1118
Storks (<i>Ciconiidae</i>)	156	48
Ibisses and Spoonbills (<i>Threskiornithidae</i>)	4	1
Hérons (<i>Ardeidae</i>)	896	3288
Cormorants (<i>Phalacrocoracidae</i>)	67	497
Rails (<i>Rallidae</i>)	43	33
Jacanas (<i>Jacaniidae</i>)	68	420
Osprey (<i>Pandionidae</i>)	1	11
Hawks and Eagles (<i>Accipitridae</i>)	75	514
Caraca's and Falcons (<i>Falconidae</i>)	7	5
Owls (<i>Strigidae</i>)	1	1
Stilts and Avocets (<i>Recurvirostridae</i>)	396	780
Plovers (<i>Charadriidae</i>)	114	118
Couriers and Pratincoles (<i>Glareolidae</i>)	61	115
Sandpipers and allies (<i>Scolopacidae</i>)	978	2065
Gulls, Terns and Skimmers (<i>Laridae</i>)	1495	4006
Kingfishers (<i>Alcedinidae</i>)	107	464
Bee-eaters (<i>Meropidae</i>)	19	134

ter vegetation dies off in the brackish and salt water of the lakes Ahémé and Nokoué and attracts large quantities of invertebrates and small fish. Also Ruff were found foraging on this floating vegetation.

Mixed social flocks of foraging Marsh Sandpipers, Greenshanks and Spotted Redshanks feeding on schools of small fish were present in a few shallow water sites. In Lagune Côtière intertidal mudflats attract species such as Grey Plover and Ringed Plover (both worm feeding species), and Whimbrel and Common Sandpiper (main prey for these two are fiddler crabs).

Since both counts, in 1996 and 1997, were carried out in February and or March, little is known of the numbers of birds in other months of the year. It is also not known whether large numbers of Black terns occur in Benin. Some coastal lagoons, especially the area near La Bouche du Roy, seem very suitable for roosts of sea-fishing terns. Large areas also seem to be attractive for White-faced whistling duck. Very little is known of the differences in bird numbers between years and seasons in Benin. For a part of Lac Nokoué long term monitoring data are available.

4.6. Threats

During the surveys indications of several types of threats to birds have been recorded:



Fish traps in the Aho complex

- Heavy, increasing demographic pressure, resulting in encroachment of wetlands; especially along the rivers and lakesides villages and other types of human settlements and activities that have asked a severe toll of the environment:
 - (over)fishing
 - eutrophication of the water ecosystems by Akadja
 - blocking of migration corridors of fish by Akadja and other fish traps
 - harvesting of vegetation for Akadja and fire wood
- Poaching and hunting; at many occasions hunting activities have been recorded, most of these for subsistence. Many children however have also been seen chasing birds, 'just for fun'. Poaching has been mentioned to occur at considerable scale. Besides subsistence hunting there were also signs of hunting for the market.
- 'Anti-pest' Bird-killing: During a visit to the Service de Protection des Végétaux institute in Porto Novo, we were told that many thousands, in total even millions of passerines were killed in an official (German development program-supported) programme to fight agricultural pests. Burning of roosts, mist netting at large scale (but killing the birds instead of releasing them), spraying chemicals and other methods were being used. Drawers full of specimens showed that these methods were successful.
- Destruction of Mangrove. This problem (the cutting of Mangrove for fire wood and wood for other purposes) has been worked on and the population has been 'sensitized'. Mangrove restoration is underway. This is also beneficial for birds (if done well and at the right locations).
- Disturbance (ranging from chasing away to shooting) of birds that are believed to cause damage to sites or crops (the disturbance besides de official programmes).
- Catching of birds for selling to tourists or native

Beninoise. Birds are caught alive and sold. This can be seen along the major roads into Cotonou, but also in the villages. On one occasion a Purple Heron was offered to us for CFA 3000. The bird was tied with a rope to a fence and the bill was captured in a tempex block to prevent the bird from pecking. We were told that the bird was caught using a net and that this was common practice.

- Pollution along watersides. Especially along the shores of Lac Nokoué the amount of plastic is worrying.

4.7. Conservation implications

Amongst the total of visited areas several habitats can be indicated as being of special importance for avifauna diversity and presumably for biodiversity in general.

This notwithstanding the fact of high demographic pressure on the wetlands in general. These habitats

deserve special attention when making plans to conserve the natural values of the wetlands of South-Benin.

Habitats to be listed include:

- River-delta plains, more specifically the areas closest to the rivers and lakes they board. Many of these remain uncultivated until now, rendering them their special value.
- Lake shores of Lac Nokoué
- Mangrove forests bordering River Aho and the Lagune Côtière
- Sand banks and other shallow places in and around the watercourses near the Bouche du Roy

It is important to stress that these surveys have been at an exploratory level only. It can give an impression of the relative importance of the wetlands of South-Benin. The species list is far from complete though and the fact that the survey is only a snapshot in a period that is not optimal for waterbirds (just before the rains come, at the driest moment therefore) should not be forgotten.



Akadja circles in the Aho

5. Suggestions for conservation and future research

For a better understanding of the dynamics of the bird community in the wetlands in South-Benin, which is necessary to develop and evaluate conservation priorities and to support decision in the framework of sustainable development of the area, further research is needed:

- Regular visits should be paid to the sites (monthly) to describe the dynamics in species composition and numbers. Sites that should as a minimum be visited include: The area of Lac Nokoué between So-Ava and Les Aguégués and Lagune de Porto Novo, Lagunes Côtière (Togbin à Grand-Popo), Sazoué et Guézin (Aho complex).
- The importance of the sites for breeding birds should be assessed and the breeding success of these birds should be monitored. Piscivorous birds are amongst the first species to get this implemented for.
- Constant Effort Site ringing as well as ringing during migration and 'wintering' will greatly increase the insight in both demographic parameters like

survival and productivity and it will yield information of the recruitment areas of species and their migration patterns.

- On a more socio-economic level gain insight in the role of birds in religion and trade in South Benin.

For the conservation of important sites one might think of:

- creation of reserves
- denomination as 'site d'intérêt'
- develop sustainable use of the sites
- integrate the local community in management practices which are beneficial for the environment in general and these sites in particular
- perform educational- and awareness-raising campaigns about the protection of birds and the roles of birds in the ecosystem. This should work through schools and colleges but also through the media;
- develop sustainable (eco-)tourism



Social fishing people in the centre of Lac Nokoué (with live music)

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Appendices

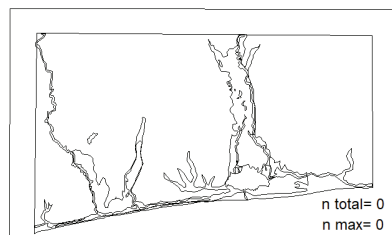
Appendix 1. Distribution maps per species: 1996 and 1997

Total per year is given as well as the maximum number per area (referring to the maximum dot size in the map). Below the average centroid position of the counting areas is given, used to schematically present the distribution of birds in the wetlands of Southern Benin.

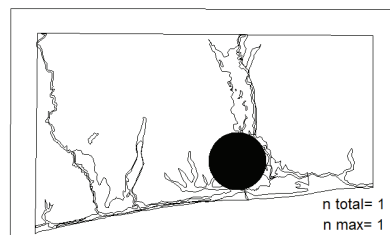
Units	order	area	latitude	longitude
Unit 1	1	So up north	6°47'40.70"N	2°22'2.23"O
Unit 1	2	Ouémé up north	6°54'43.33"N	2°26'51.89"O
Unit 1	3	So	6°30'37.05"N	2°24'29.68"O
Unit 1	4	Ouémé	6°28'29.93"N	2°30'46.38"O
Unit 1	5	Lac Nokoué	6°26'46.53"N	2°23'34.95"O
Unit 1	6	Lagunes Anciennes	6°23'34.89"N	2°10'24.97"O
Unit 2	7	Lac Ahémé	6°26'26.63"N	1°56'51.88"O
Unit 2	8	Aho complex	6°21'16.92"N	1°57'38.83"O
Unit 3	9	Lower Mono Delta	6°18'31.98"N	1°59'21.06"O
Unit 4	10	Lagune Porto Novo	6°28'23.98"N	2°36'22.98"O

Little Grebe - Grèbe castagneux - *Tachybaptus ruficollis*

1996

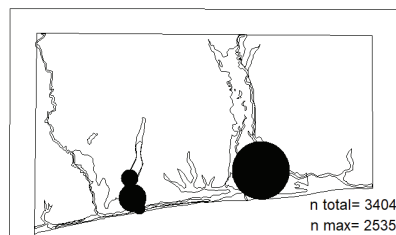


1997

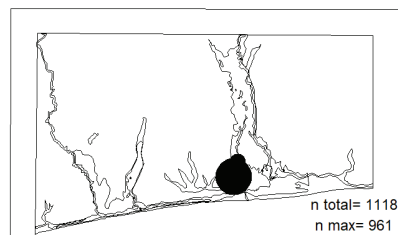


White-faced Whistling Duck - *Dendrocygne veuf* - *Dendrocygna viduata*

1996

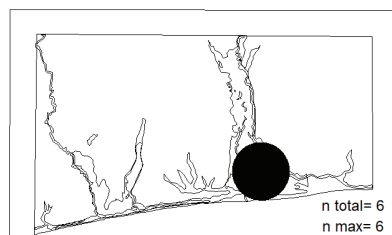


1997

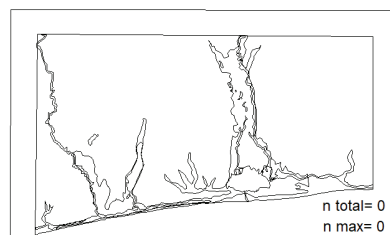


Knob-billed Duck - Canard à bosse - *Sarkidiornis melanotos*

1996

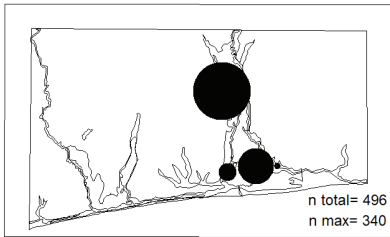


1997

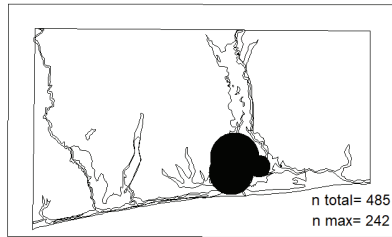


African Openbill - Bec-ouvert africain - *Anastomus lamelligerus*

1996

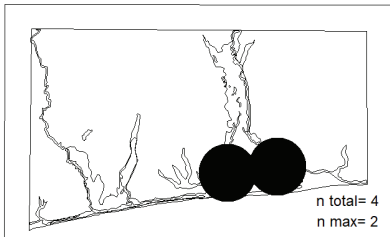


1997

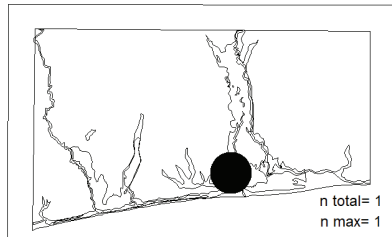


Glossy Ibis - Ibis falcinelle - *Plegadis falcinellus*

1996

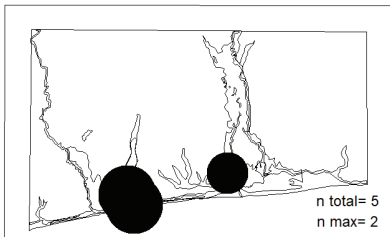


1997

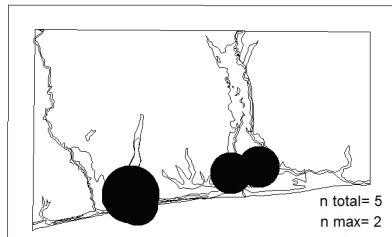


Striated Heron - Héron strié - *Butorides striata*

1996

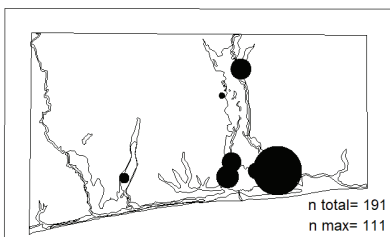


1997

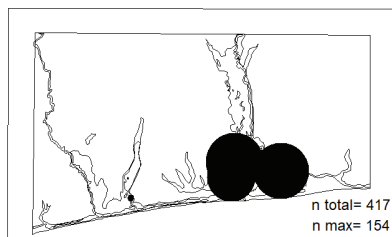


Squacco Heron - Crabier chevelu - *Ardeola ralloides*

1996

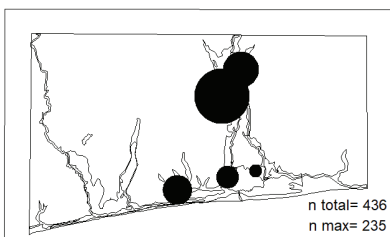


1997

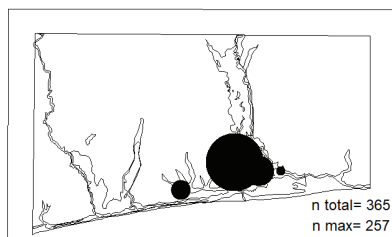


Western Cattle Egret - Héron garde-boeufs - *Bubulcus ibis*

1996

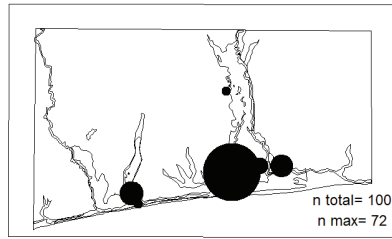


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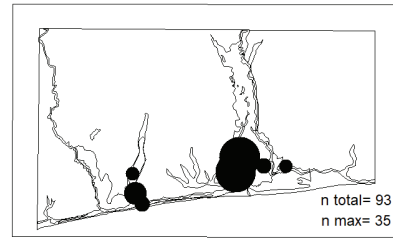


Grey Heron - Héron cendré - *Ardea cinerea*

1996

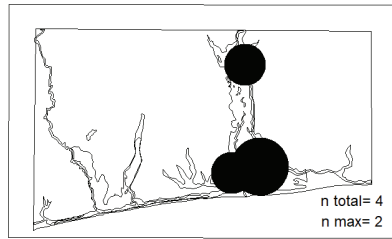


1997

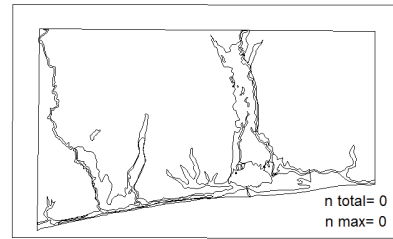


Goliath Heron - Héron goliath - *Ardea goliath*

1996

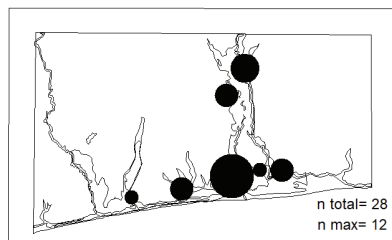


1997

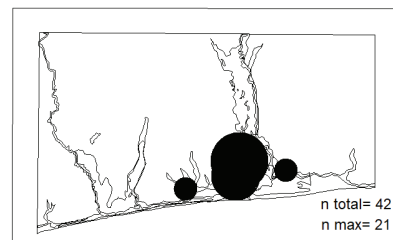


Purple Heron - Héron pourpré - *Ardea purpurea*

1996

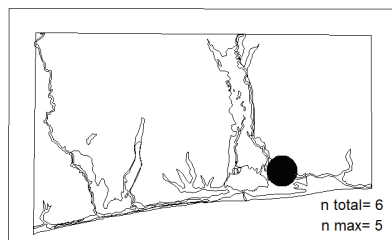


1997

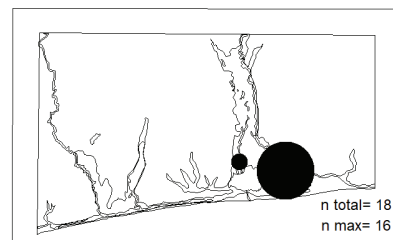


Intermediate Egret - Aigrette intermédiaire - *Ardea intermedia*

1996

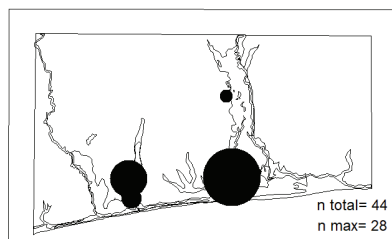


1997

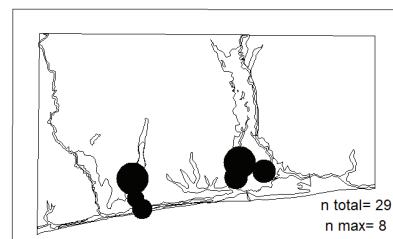


Western Reef Heron - Aigrette à gorge blanche - *Egretta gularis*

1996

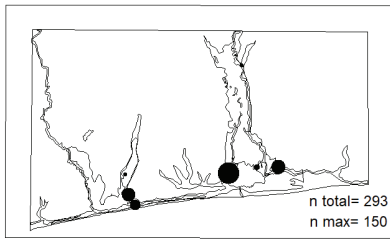


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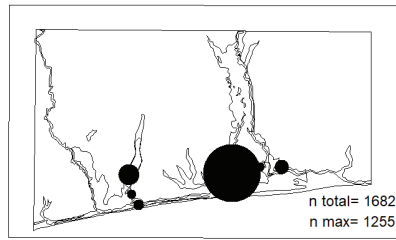


Little Egret - Aigrette garzette - *Egretta garzetta*

1996

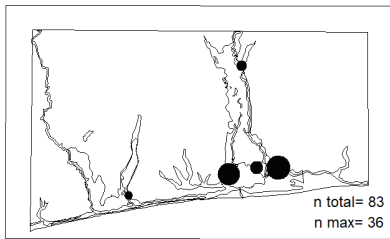


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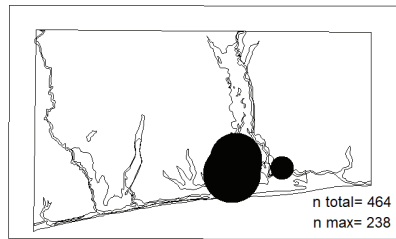


Great Egret - Grande Aigrette - *Ardea alba*

1996

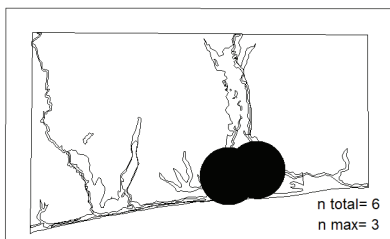


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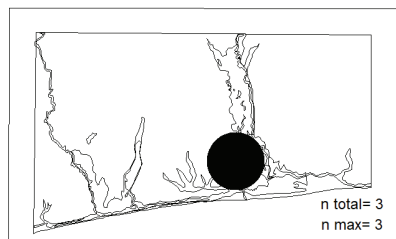


Little Bittern - Blongios nain - *Ixobrychus minutus*

1996

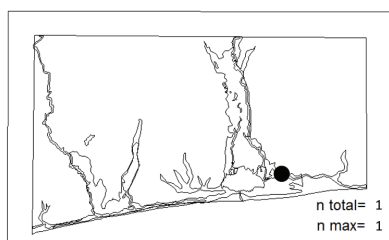


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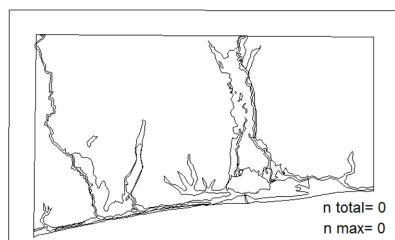


Eurasian Bittern - Butor étoilé - *Botaurus stellaris*

1996

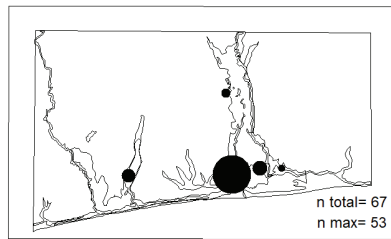


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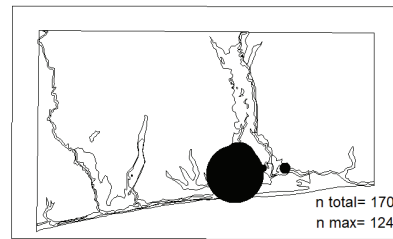


Black Heron - Aigrette ardoisée - *Egretta ardesiaca*

1996

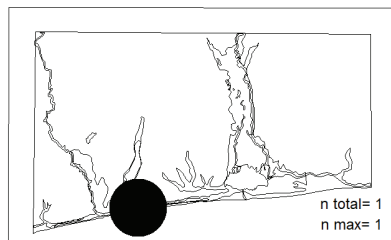


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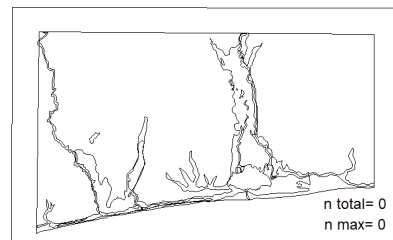


Hamerkop - Ombrette africaine - *Scopus umbretta*

1996

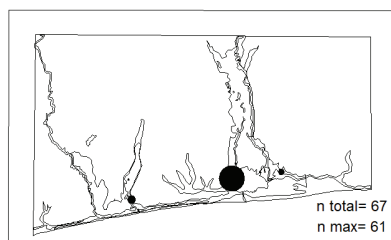


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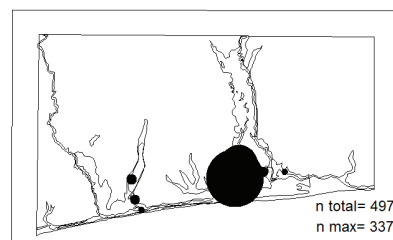


Reed Cormorant - Cormoran africain - *Microcarbo africanus*

1996

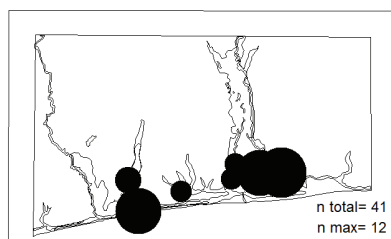


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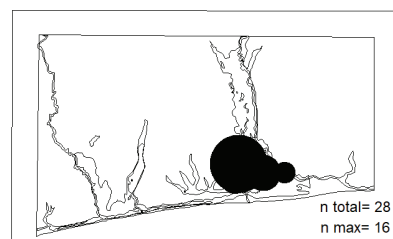


Black Crake - Râle à bec jaune - *Amaurornis flavirostra*

1996

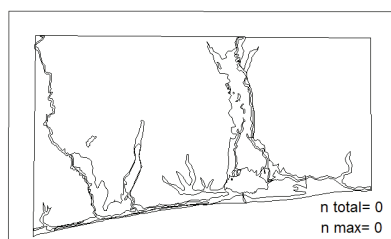


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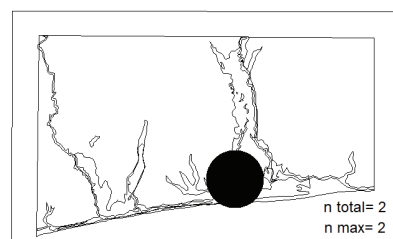


African Swampfen - Talève de Madagascar - *Porphyrio madagascariensis*

1996

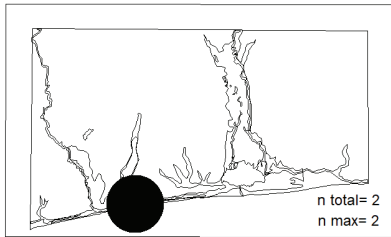


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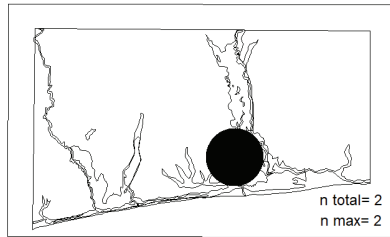


Allen's Gallinule - Talève d'Allen - *Porphyrio alleni*

1996

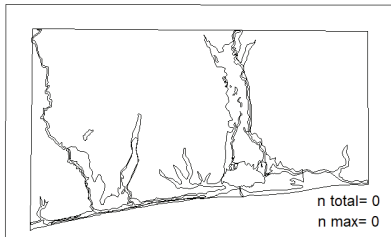


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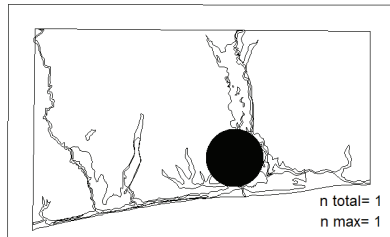


Common Moorhen - Gallinule poule d'eau - *Gallinula chloropus*

1996

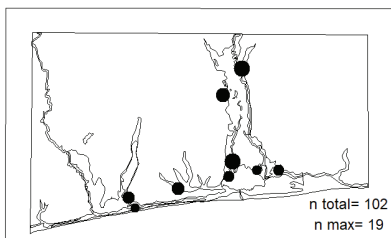


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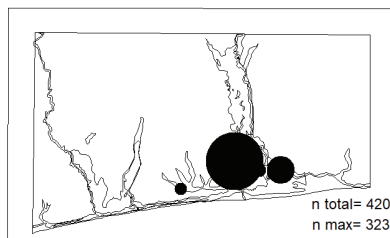


African Jacana - Jacana à poitrine dorée - *Actophilornis africanus*

1996

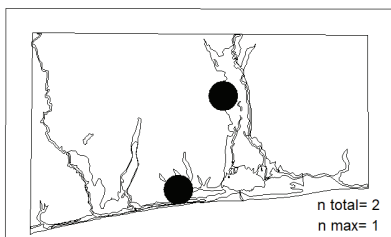


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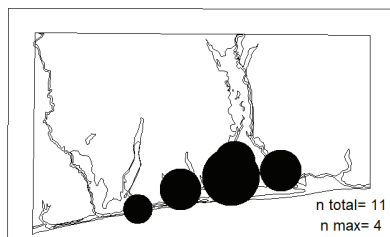


Western Osprey - Balbuzard pêcheur - *Pandion haliaetus*

1996

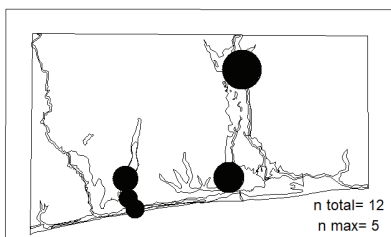


1997

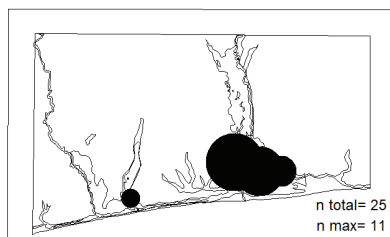


Black-winged Kite - Élanion blanc - *Elanus caeruleus*

1996

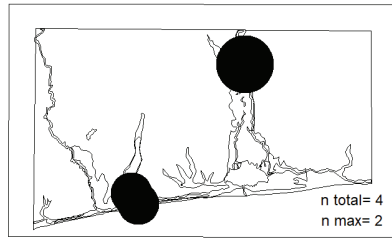


1997

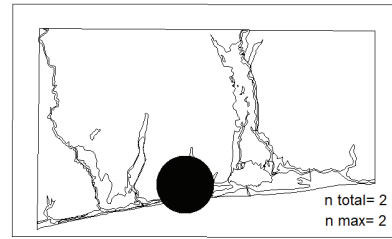


African Harrier-Hawk - *Gymnogène d'Afrique* - *Polyboroides typus*

1996

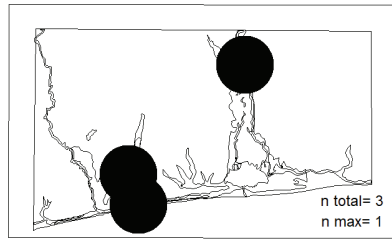


1997

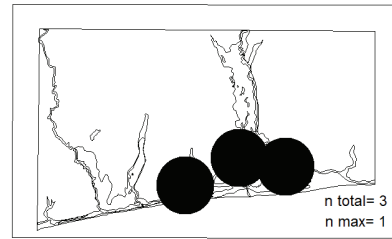


Shikra - Épervier shikra - *Accipiter badius*

1996

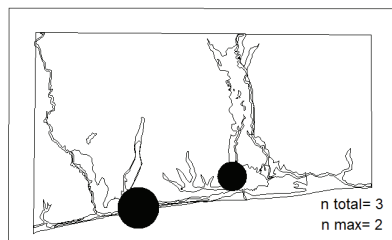


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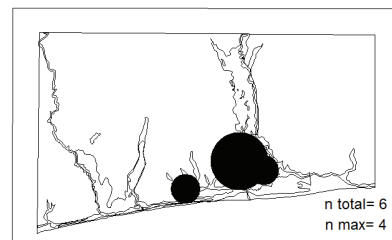


Gabar Goshawk - Autour gabar - *Micronisus gabar*

1996

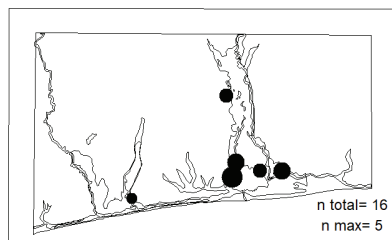


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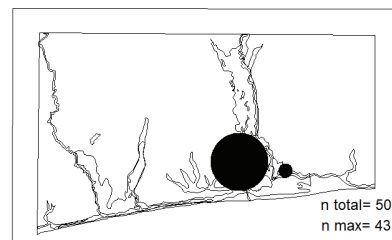


Western Marsh Harrier - Busard des roseaux - *Circus aeruginosus*

1996

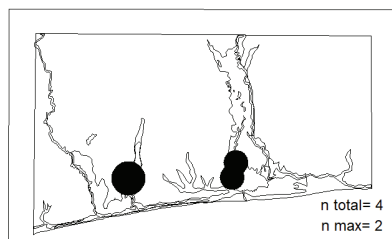


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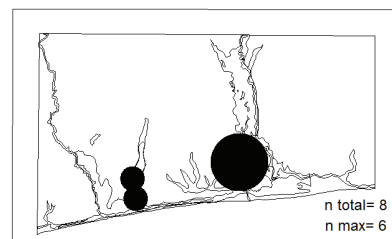


Montagu's Harrier - Busard cendré - *Circus pygargus*

1996

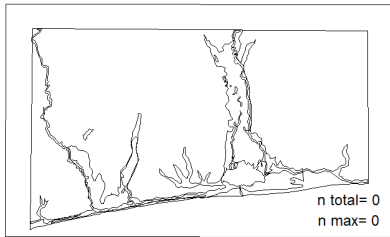


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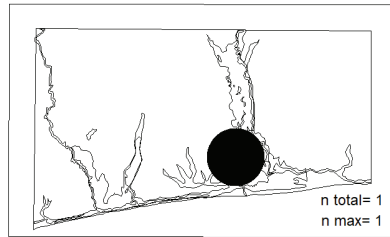


Harrier spec. - Busard sp. - Circus sp.

1996

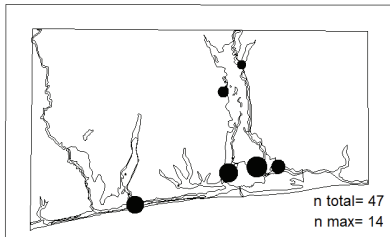


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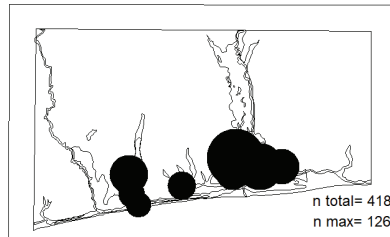


Yellow-billed Kite - Milvus aegyptius

1996

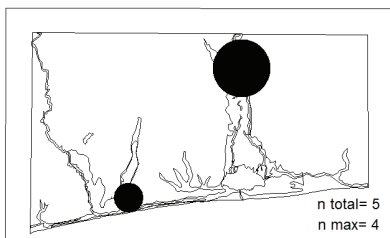


1997

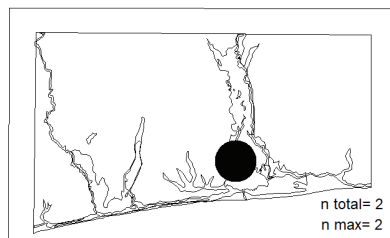


Lizard Buzzard - Autour unibande - Kaupifalco monogrammicus

1996

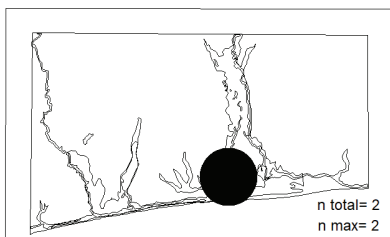


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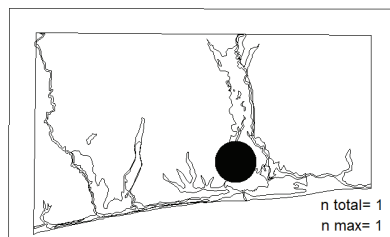


Common Kestrel - Faucon crécerelle - Falco tinnunculus

1996

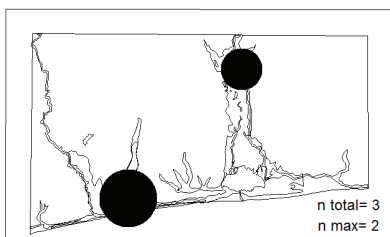


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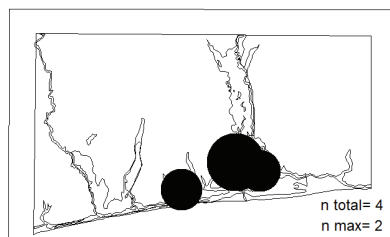


Lanner Falcon - Faucon lanier - Falco biarmicus

1996

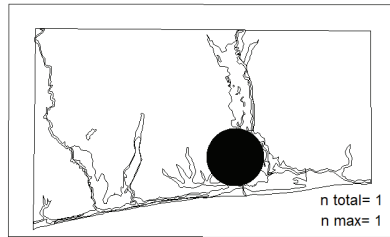


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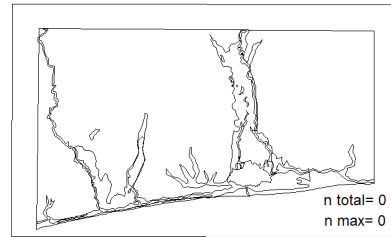


Peregrine Falcon - Faucon pèlerin - *Falco peregrinus*

1996

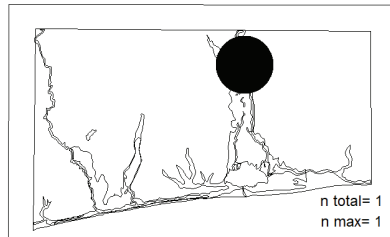


1997

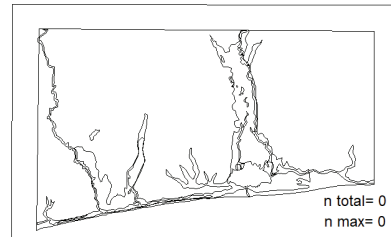


Grey Kestrel - Faucon ardoisé - *Falco ardosiaceus*

1996

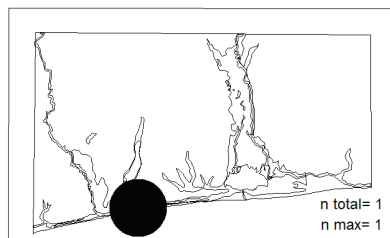


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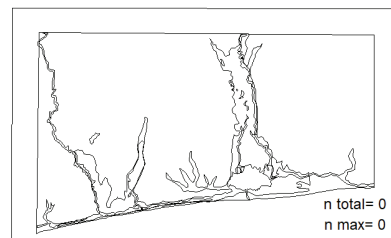


African Hobby - Faucon de Cuvier - *Falco cuvierii*

1996

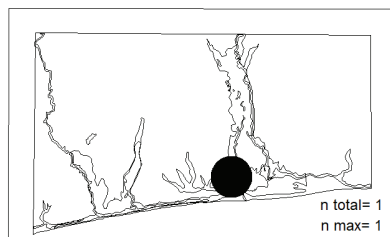


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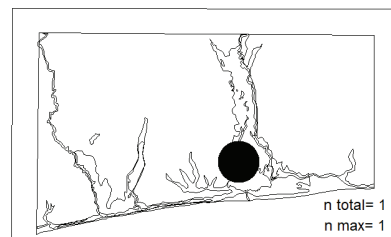


Marsh Owl - Hibou du Cap - *Asio capensis*

1996

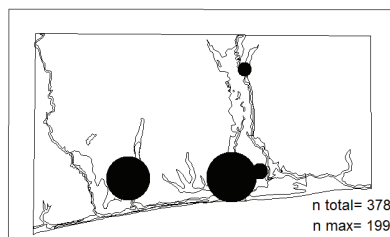


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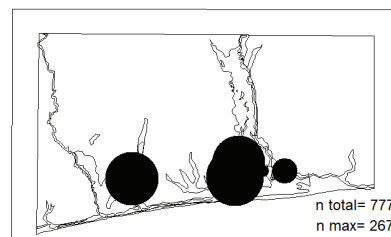


Black-winged Stilt - Echasse blanche - *Himantopus himantopus*

1996

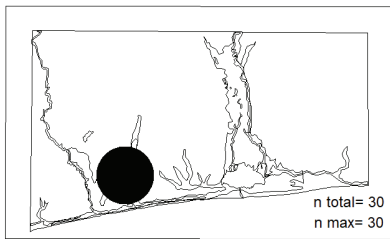


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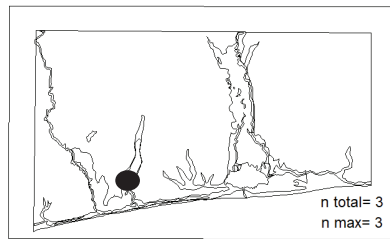


Pied Avocet - Avocette élégante - *Recurvirostra avosetta*

1996

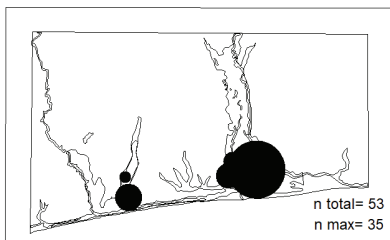


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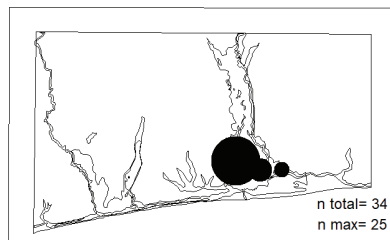


Spur-winged Lapwing - Vanneau éperonné - *Vanellus spinosus*

1996

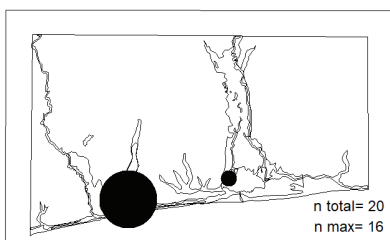


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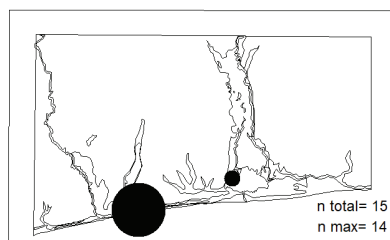


Grey Plover - Pluvier argenté - *Pluvialis squatarola*

1996

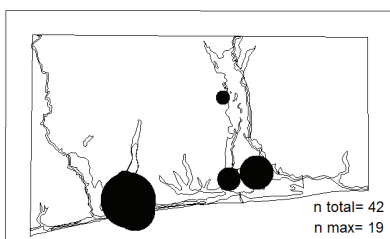


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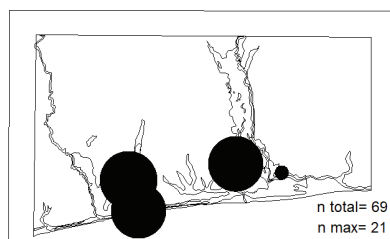


Common Ringed Plover - Grand Gravelot - *Charadrius hiaticula*

1996

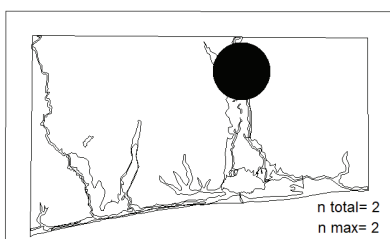


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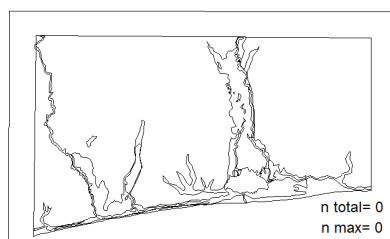


Forbes's Plover - Pluvier de Forbes - *Charadrius forbesi*

1996

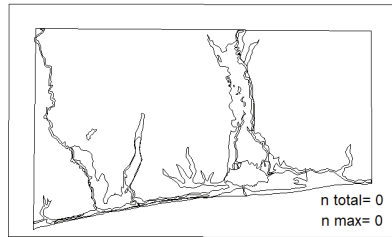


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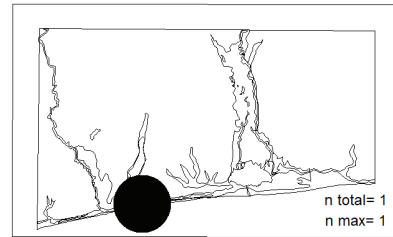


Kittlitz's Plover - Gravelot pâtre - *Charadrius pecuarius*

1996

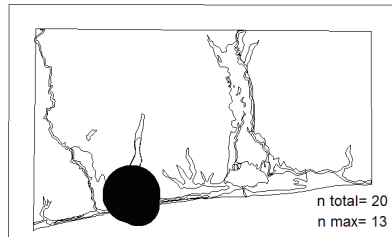


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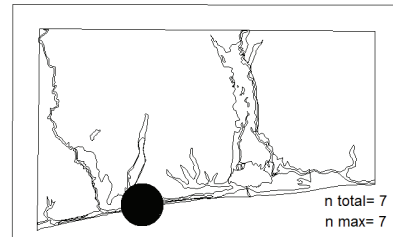


White-fronted Plover - Pluvier à front blanc - *Charadrius marginatus*

1996

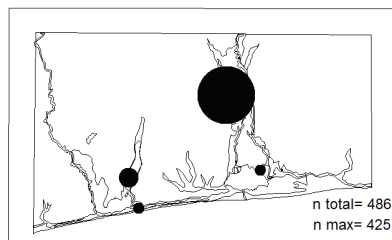


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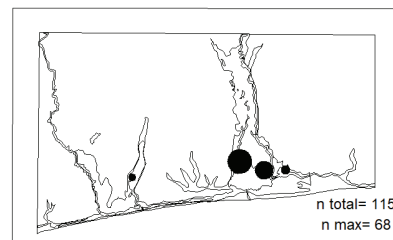


Collared Pratincole - Glaréole à collier - *Glareola pratincola*

1996

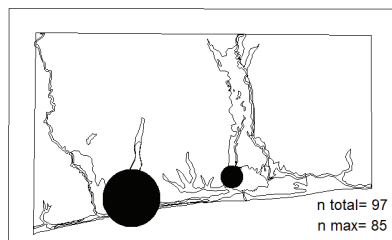


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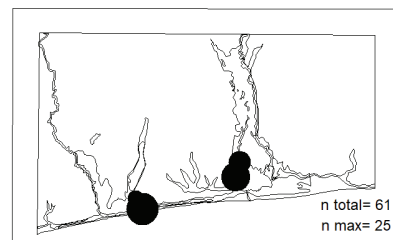


Eurasian Whimbrel - Courlis corlieu - *Numenius phaeopus*

1996

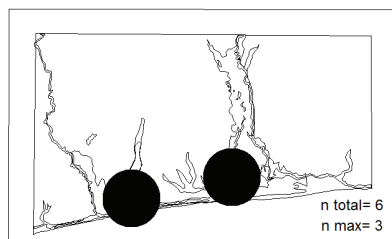


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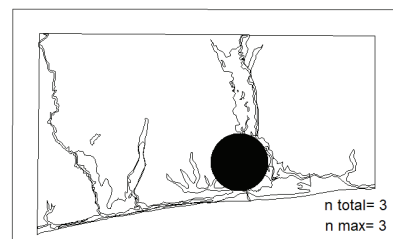


Eurasian Curlew - Courlis cendré - *Numenius arquata*

1996

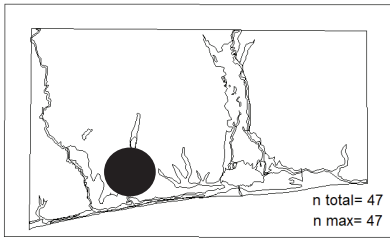


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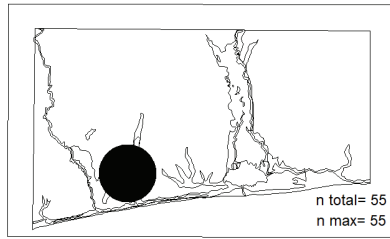


Black-tailed Godwit - Barge à queue noire - *Limosa limosa*

1996

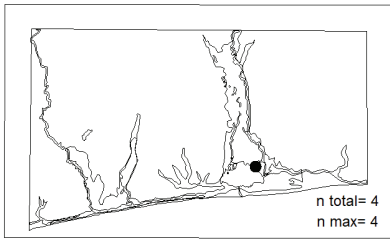


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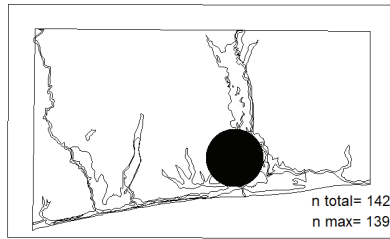


Ruff - Combattant varié - *Calidris pugnax*

1996

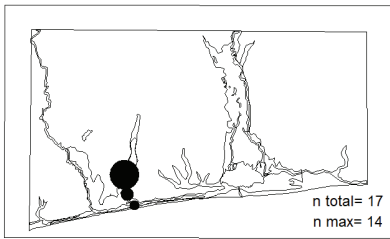


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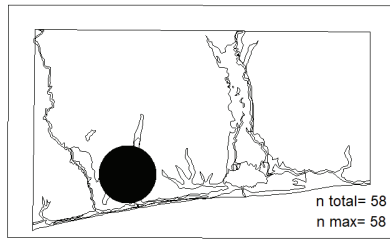


Little Stint - Bécasseau minute - *Calidris minuta*

1996

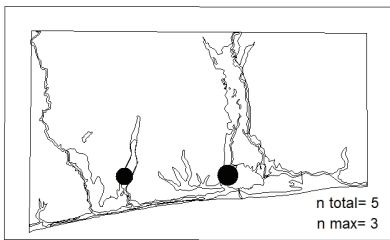


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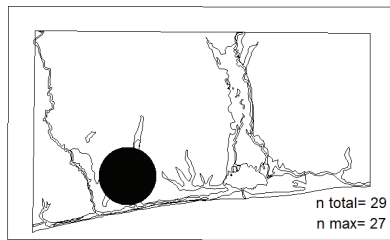


Curlew Sandpiper - Bécasseau cocorli - *Calidris ferruginea*

1996

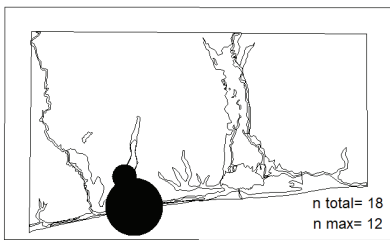


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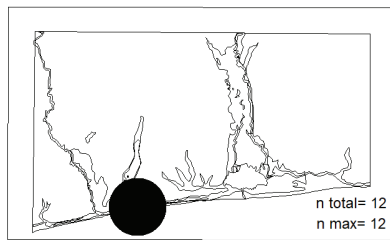


Sanderling - Bécasseau sanderling - *Calidris alba*

1996

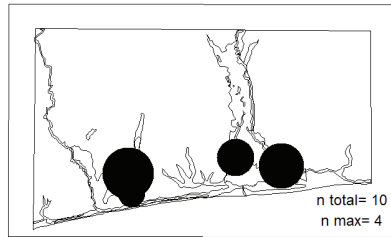


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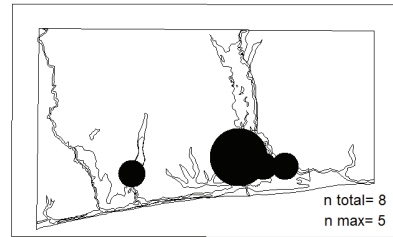


Common Snipe - Bécassine des marais - *Gallinago gallinago*

1996

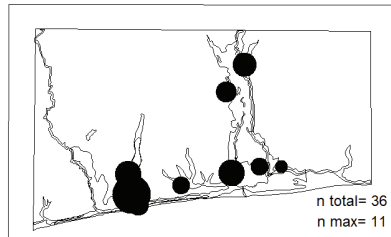


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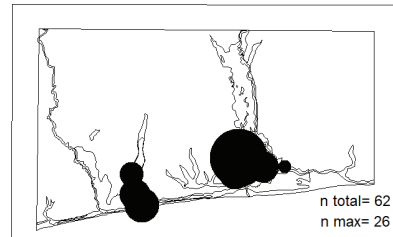


Common Sandpiper - Chevalier guignette - *Actitis hypoleucos*

1996

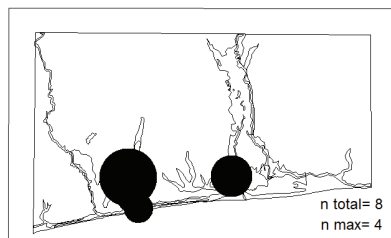


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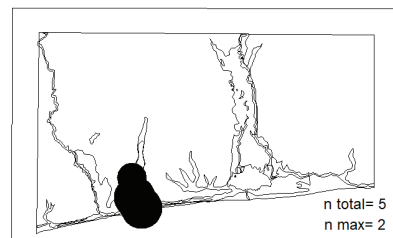


Common Redshank - Chevalier gambette - *Tringa totanus*

1996

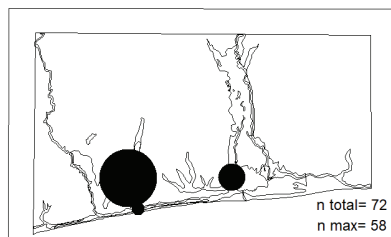


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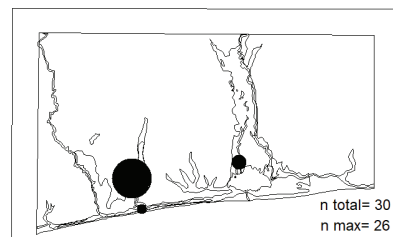


Marsh Sandpiper - Chevalier stagnatile - *Tringa stagnatilis*

1996

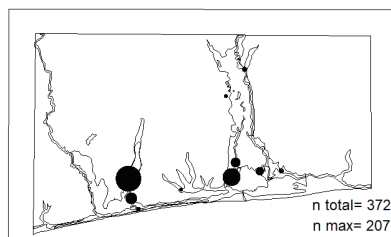


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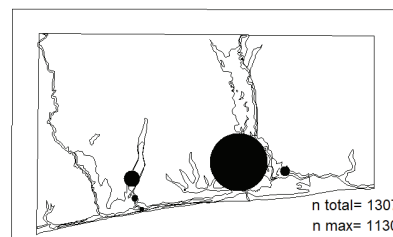


Wood Sandpiper - Chevalier sylvain - *Tringa glareola*

1996

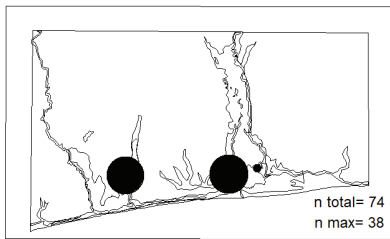


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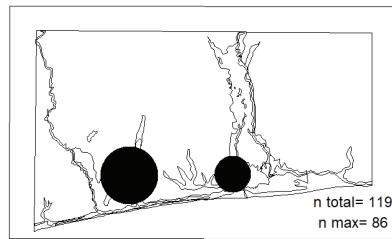


Spotted Redshank - Chevalier arlequin - *Tringa erythropus*

1996

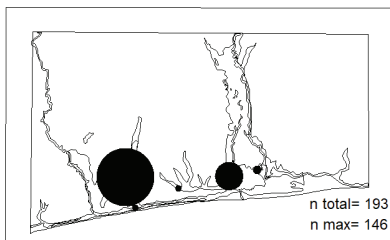


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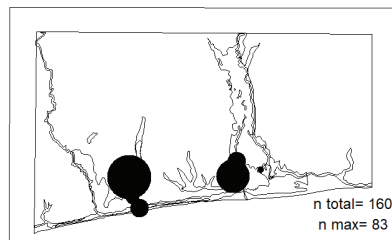


Common Greenshank - Chevalier aboyeur - *Tringa nebularia*

1996

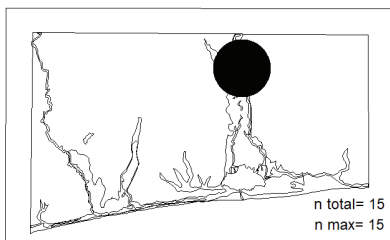


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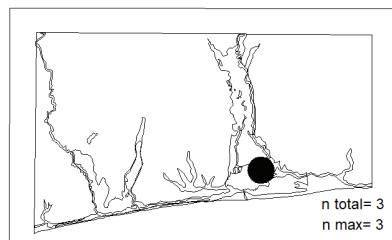


Crocodile-bird - Pluvian fluviatile - *Pluvianus aegyptius*

1996

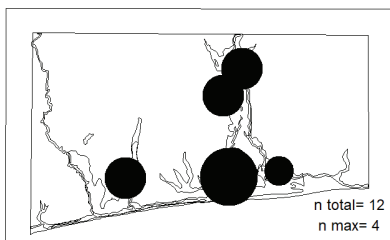


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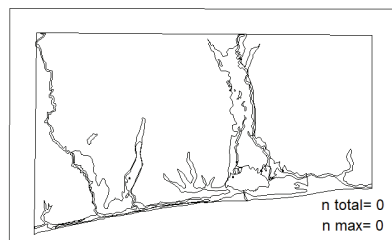


Green Sandpiper - Chevalier culblanc - *Tringa ochropus*

1996

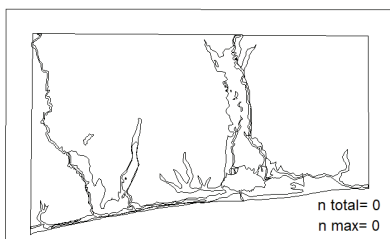


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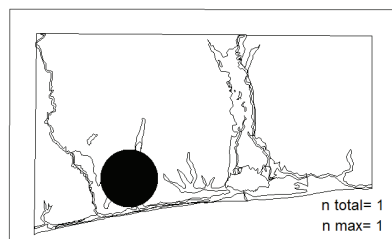


Terek Sandpiper - Chevalier bargette - *Xenus cinereus*

1996

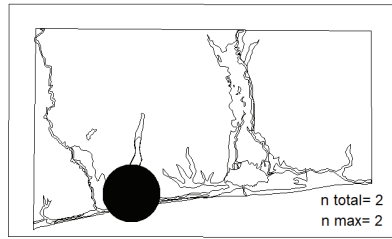


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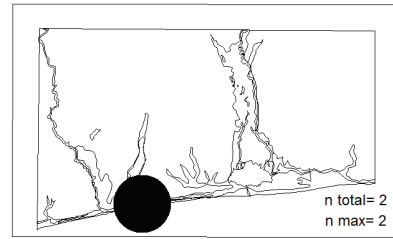


Ruddy Turnstone - Tournepierre à collier - *Arenaria interpres*

1996

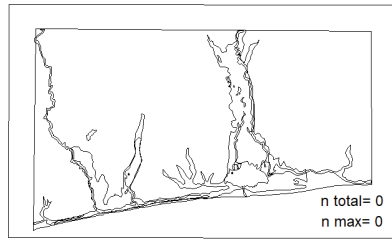


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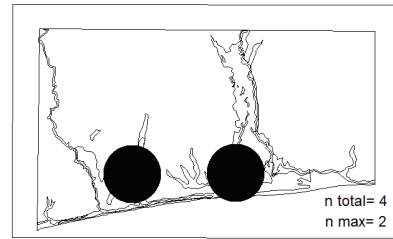


Lesser Black-backed Gull - Goéland brun - *Larus fuscus*

1996

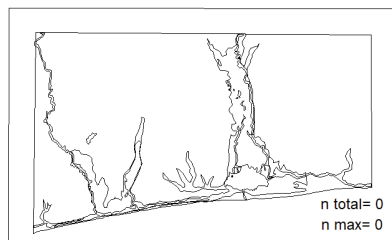


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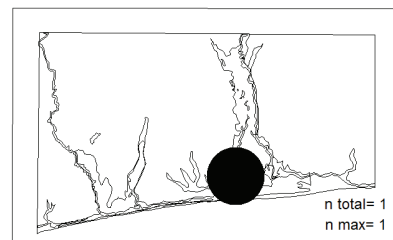


Caspian Tern - Sterne caspienne - *Hydroprogne caspia*

1996

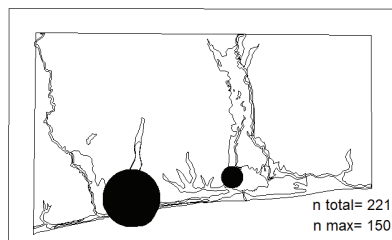


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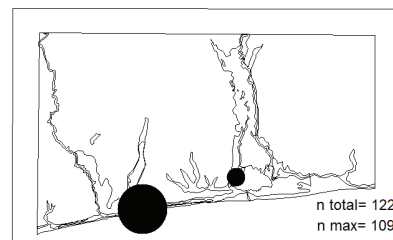


Royal Tern - Sterne royale - *Thalasseus maximus*

1996

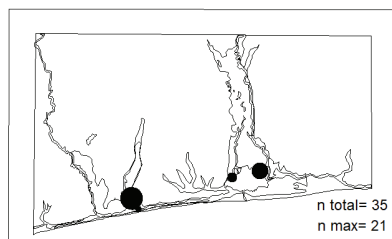


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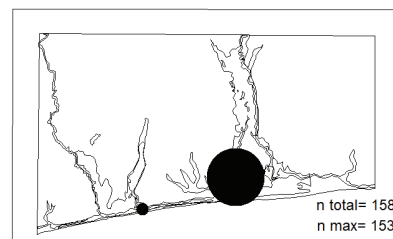


Sandwich Tern - Sterne caugek - *Thalasseus sandvicensis*

1996

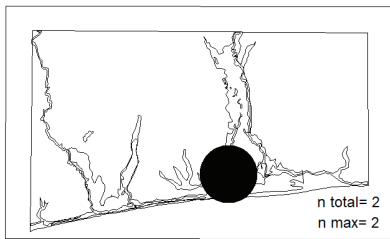


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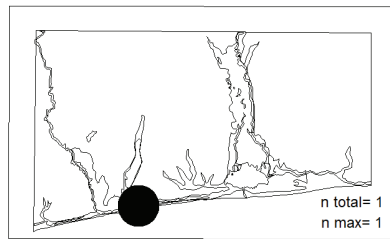


Gull-billed Tern - Sterne hansel - *Gelochelidon nilotica*

1996

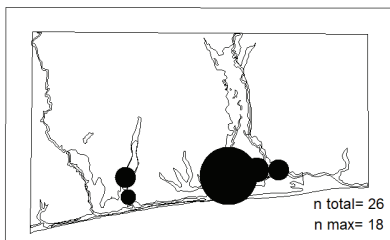


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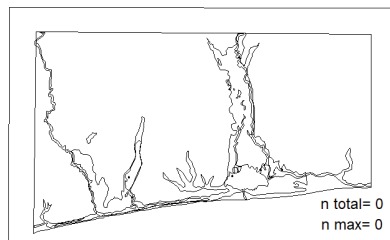


Common Tern - Sterne pierregarin - *Sterna hirundo*

1996

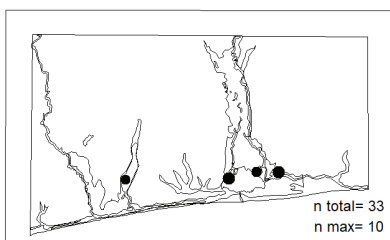


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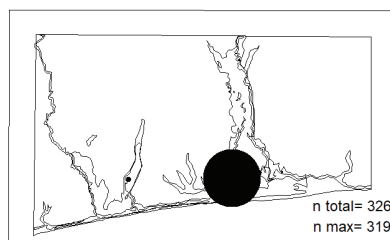


Whiskered Tern - Guifette moustac - *Chlidonias hybrida*

1996

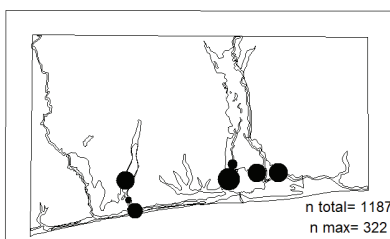


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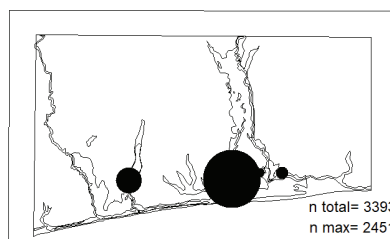


Black Tern - Guifette noire - *Chlidonias niger*

1996

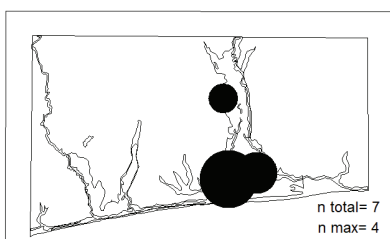


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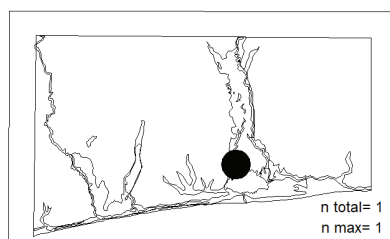


White-winged Tern - Guifette leucoptère - *Chlidonias leucopterus*

1996

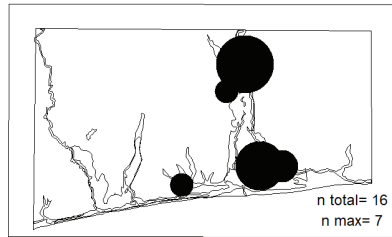


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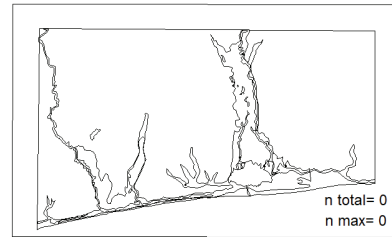


Grey-headed Kingfisher - Martin-chasseur à tête grise - *Halcyon leucocephala*

1996

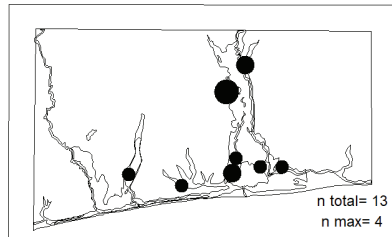


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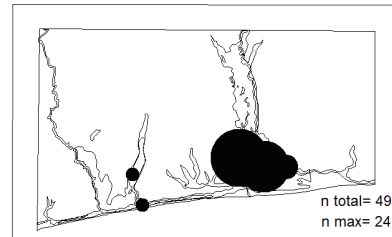


Woodland Kingfisher - Martin-chasseur du Sénégal - *Halcyon senegalensis*

1996

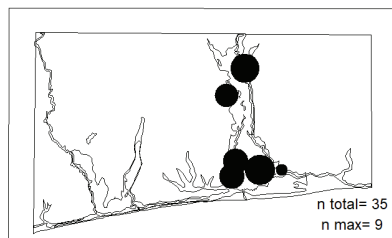


1997

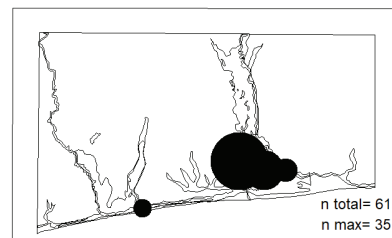


Malachite Kingfisher - Martin-pêcheur huppé - *Corythornis cristatus*

1996

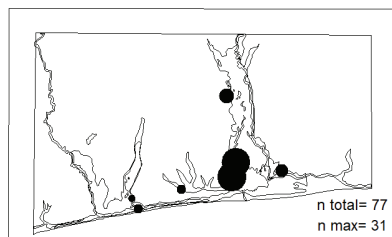


1997

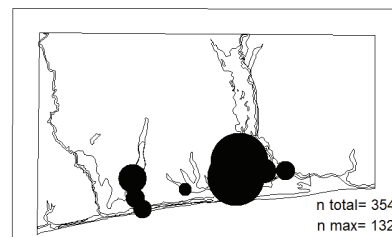


Pied Kingfisher - Martin-pêcheur pie - *Ceryle rudis*

1996

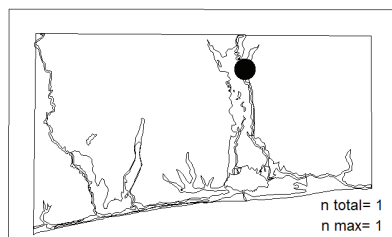


1997

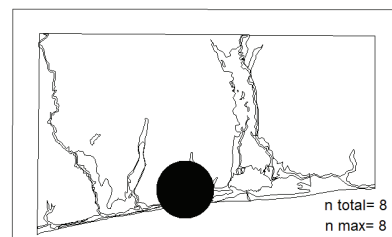


Rosy Bee-eater - Guépier gris-rose - *Merops malimbicus*

1996

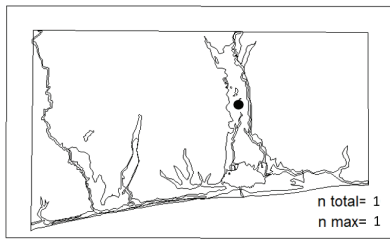


1997

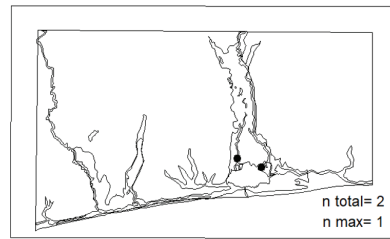


Little Bee-eater - Guêpier nain - *Merops pusillus*

1996

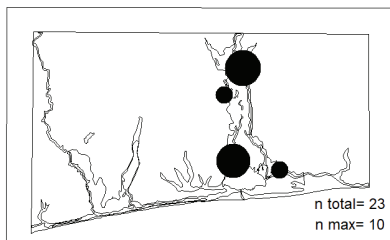


1997

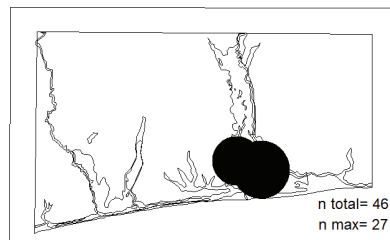


Northern Carmine Bee-eater - Guêpier écarlate - *Merops nubicus*

1996

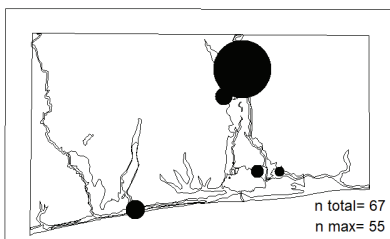


1997

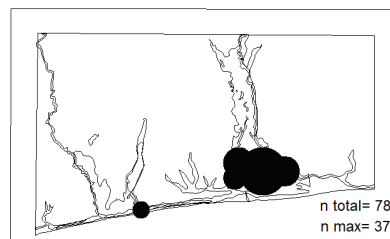


White-throated Bee-eater - Guêpier à gorge blanche - *Merops albicollis*

1996



1997



Appendix 2. Species numbers counted in 1996 and/or 1997 per unit and area

Units	area	Species	1996	1997
Unit 1	So up north	African Openbill - Bec-ouvert africain - <i>A-stomus lamelligerus</i>	340	-
Unit 1	So up north	Squacco Heron - Crabier chevelu - <i>Ardeola ralloides</i>	3	-
Unit 1	So up north	Western Cattle Egret - Héron garde-boeufs - <i>Bubulcus ibis</i>	235	-
Unit 1	So up north	Grey Heron - Héron cendré - <i>Ardea cinerea</i>	1	-
Unit 1	So up north	Purple Heron - Héron pourpré - <i>Ardea purpurea</i>	3	-
Unit 1	So up north	Western Reef Heron - Aigrette à gorge blanche - <i>Egretta gularis</i>	1	-
Unit 1	So up north	Black Heron - Aigrette ardoisée - <i>Egretta ardesiaca</i>	2	-
Unit 1	So up north	African Jaca- - Jaca- à poitrine dorée - <i>Actophilornis africanus</i>	15	-
Unit 1	So up north	Western Osprey - Balbuzard pêcheur - <i>Pandion haliaetus</i>	1	-
Unit 1	So up north	Western Marsh Harrier - Busard des roseaux - <i>Circus aeruginosus</i>	2	-
Unit 1	So up north	Yellow-billed Kite - <i>Milvus aegyptius</i>	3	-
Unit 1	So up north	Common Ringed Plover - Grand Gravelot - <i>Charadrius hiaticula</i>	1	-
Unit 1	So up north	Collared Pratincole - Glaréole à collier - <i>Glareola pratincola</i>	425	-
Unit 1	So up north	Common Sandpiper - Chevalier guignette - <i>Actitis hypoleucos</i>	3	-
Unit 1	So up north	Wood Sandpiper - Chevalier sylvain - <i>Tringa glareola</i>	1	-
Unit 1	So up north	Green Sandpiper - Chevalier culblanc - <i>Tringa ochropus</i>	2	-
Unit 1	So up north	White-winged Tern - Guifette leucoptère - <i>Chlidonias leucopterus</i>	1	-
Unit 1	So up north	Grey-headed Kingfisher - Martin-chasseur à tête grise - <i>Halcyon leucocephala</i>	1	-
Unit 1	So up north	Woodland Kingfisher - Martin-chasseur du Sénégal - <i>Halcyon senegalensis</i>	4	-
Unit 1	So up north	Malachite Kingfisher - Martin-pêcheur huppé - <i>Corythornis cristatus</i>	5	-
Unit 1	So up north	Pied Kingfisher - Martin-pêcheur pie - <i>Ceryle rudis</i>	7	-
Unit 1	So up north	White-throated Bee-eater - Guêpier à gorge blanche - <i>Merops albicollis</i>	4	-
Unit 1	So up north	Little Bee-eater - Guêpier -in - <i>Merops pusillus</i>	2	-
Unit 1	So up north	Northern Carmine Bee-eater - Guêpier écarlate - <i>Merops nubicus</i>	2	-
Unit 1	Ouémé up north	Squacco Heron - Crabier chevelu - <i>Ardeola ralloides</i>	19	-
Unit 1	Ouémé up north	Western Cattle Egret - Héron garde-boeufs - <i>Bubulcus ibis</i>	95	-
Unit 1	Ouémé up north	Goliath Heron - Héron goliath - <i>Ardea goliath</i>	1	-
Unit 1	Ouémé up north	Purple Heron - Héron pourpré - <i>Ardea purpurea</i>	5	-
Unit 1	Ouémé up north	Little Egret - Aigrette garzette - <i>Egretta garzetta</i>	1	-
Unit 1	Ouémé up north	Great Egret - Grande Aigrette - <i>Ardea alba</i>	5	-
Unit 1	Ouémé up north	African Jaca- - Jaca- à poitrine dorée - <i>Actophilornis africanus</i>	19	-
Unit 1	Ouémé up north	Black-winged Kite - Élanion blanc - <i>Elanus caeruleus</i>	5	-
Unit 1	Ouémé up north	African Harrier-Hawk - Gymnogène d'Afrique - <i>Polyboroides typus</i>	2	-
Unit 1	Ouémé up north	Shikra - Épervier shikra - <i>Accipiter badius</i>	1	-
Unit 1	Ouémé up north	Yellow-billed Kite - <i>Milvus aegyptius</i>	2	-
Unit 1	Ouémé up north	Lizard Buzzard - Autour unibande - <i>Kaupifalco monogrammicus</i>	4	-
Unit 1	Ouémé up north	Lanner Falcon - Faucon lanier - <i>Falco biarmicus</i>	1	-
Unit 1	Ouémé up north	Grey Kestrel - Faucon ardoisé - <i>Falco ardosiaceus</i>	1	-
Unit 1	Ouémé up north	Black-winged Stilt - Echasse blanche - <i>Himantopus himantopus</i>	12	-
Unit 1	Ouémé up north	Forbes's Plover - Pluvier de Forbes - <i>Charadrius forbesi</i>	2	-
Unit 1	Ouémé up north	Common Sandpiper - Chevalier guignette - <i>Actitis hypoleucos</i>	4	-
Unit 1	Ouémé up north	Wood Sandpiper - Chevalier sylvain - <i>Tringa glareola</i>	3	-
Unit 1	Ouémé up north	Egyptian Plover - Pluvian fluviatile - <i>Pluvianus aegyptius</i>	15	-
Unit 1	Ouémé up north	Green Sandpiper - Chevalier culblanc - <i>Tringa ochropus</i>	2	-
Unit 1	Ouémé up north	Grey-headed Kingfisher - Martin-chasseur à tête grise - <i>Halcyon leucocephala</i>	7	-
Unit 1	Ouémé up north	Woodland Kingfisher - Martin-chasseur du Sénégal - <i>Halcyon senegalensis</i>	2	-
Unit 1	Ouémé up north	Malachite Kingfisher - Martin-pêcheur huppé - <i>Corythornis cristatus</i>	8	-
Unit 1	Ouémé up north	White-throated Bee-eater - Guêpier à gorge blanche - <i>Merops albicollis</i>	55	-
Unit 1	Ouémé up north	Rosy Bee-eater - Guêpier gris-rose - <i>Merops malimbicus</i>	1	-
Unit 1	Ouémé up north	Northern Carmine Bee-eater - Guêpier écarlate - <i>Merops nubicus</i>	10	-
Unit 1	So	Little Grebe - Grèbe castagneux - <i>Tachybaptus ruficollis</i>	0	1
Unit 1	So	White-faced Whistling Duck - Dendrocygne veuf - <i>Dendrocygna viduata</i>	0	157
Unit 1	So	African Openbill - Bec-ouvert africain - <i>Anastomus lamelligerus</i>	0	242
Unit 1	So	Squacco Heron - Crabier chevelu - <i>Ardeola ralloides</i>	17	154
Unit 1	So	Western Cattle Egret - Héron garde-boeufs - <i>Bubulcus ibis</i>	0	257
Unit 1	So	Grey Heron - Héron cendré - <i>Ardea cinerea</i>	0	35
Unit 1	So	Purple Heron - Héron pourpré - <i>Ardea purpurea</i>	0	21
Unit 1	So	Intermediate Egret - Aigrette intermédiaire - <i>Egretta intermedia</i>	1	2
Unit 1	So	Western Reef Heron - Aigrette à gorge blanche - <i>Egretta gularis</i>	1	8
Unit 1	So	Little Egret - Aigrette garzette - <i>Egretta garzetta</i>	0	157
Unit 1	So	Great Egret - Grande Aigrette - <i>Ardea alba</i>	0	191
Unit 1	So	Little Bittern - Blongios nain - <i>Ixobrychus minutus</i>	0	3

Units	area	Species	1996	1997
Unit 1	So	Eurasian Bittern - Butor étoilé - <i>Botaurus stellaris</i>	2	0
Unit 1	So	Black Heron - Aigrette ardoisée - <i>Egretta ardesiaca</i>	0	42
Unit 1	So	Reed Cormorant - Cormoran africain - <i>Microcarbo africanus</i>	0	136
Unit 1	So	Black Crane - Râle à bec jaune - <i>Amaurornis flavirostra</i>	2	16
Unit 1	So	Allen's Gallinule - Talève d'Allen - <i>Porphyrio alleni</i>	0	2
Unit 1	So	Common Moorhen - Gallinule poule d'eau - <i>Gallinula chloropus</i>	0	1
Unit 1	So	African Jacana - Jacana à poitrine dorée - <i>Actophilornis africanus</i>	19	323
Unit 1	So	Western Osprey - Balbuzard pêcheur - <i>Pandion haliaetus</i>	0	2
Unit 1	So	Black-winged Kite - Élanion blanc - <i>Elanus caeruleus</i>	0	11
Unit 1	So	Shikra - Épervier shikra - <i>Accipiter badius</i>	0	1
Unit 1	So	Gabar Goshawk - Autour gabar - <i>Micronisus gabar</i>	0	4
Unit 1	So	Western Marsh Harrier - Busard des roseaux - <i>Circus aeruginosus</i>	3	43
Unit 1	So	Montagu's Harrier - Busard cendré - <i>Circus pygargus</i>	1	6
Unit 1	So	Harrier spec. - Busard sp. - <i>Circus sp.</i>	0	1
Unit 1	So	Yellow-billed Kite - <i>Milvus aegyptius</i>	0	126
Unit 1	So	Lizard Buzzard - Autour unibande - <i>Kaupifalco monogrammicus</i>	0	2
Unit 1	So	Common Kestrel - Faucon crécerelle - <i>Falco tinnunculus</i>	0	1
Unit 1	So	Lanner Falcon - Faucon lanier - <i>Falco biarmicus</i>	0	2
Unit 1	So	Peregrine Falcon - Faucon pèlerin - <i>Falco peregrinus</i>	1	0
Unit 1	So	Marsh Owl - Hibou du Cap - <i>Asio capensis</i>	0	1
Unit 1	So	Black-winged Stilt - Echasse blanche - <i>Himantopus himantopus</i>	0	222
Unit 1	So	Spur-winged Lapwing - Vanneau éperonné - <i>Vanellus spinosus</i>	3	25
Unit 1	So	Common Ringed Plover - Grand Gravelot - <i>Charadrius hiaticula</i>	0	19
Unit 1	So	Collared Pratincole - Glaréole à collier - <i>Glareola pratincola</i>	0	68
Unit 1	So	Eurasian Whimbrel - Courlis corlieu - <i>Numenius phaeopus</i>	0	11
Unit 1	So	Eurasian Curlew - Courlis cendré - <i>Numenius arquata</i>	0	3
Unit 1	So	Ruff - Combattant varié - <i>Calidris pugnax</i>	0	139
Unit 1	So	Common Snipe - Bécassine des marais - <i>Gallinago gallinago</i>	2	5
Unit 1	So	Common Sandpiper - Chevalier guignette - <i>Actitis hypoleucos</i>	0	26
Unit 1	So	Marsh Sandpiper - Chevalier stagnatile - <i>Tringa stagnatilis</i>	0	3
Unit 1	So	Wood Sandpiper - Chevalier sylvain - <i>Tringa glareola</i>	21	1130
Unit 1	So	Common Greenshank - Chevalier aboyeur - <i>Tringa nebularia</i>	0	12
Unit 1	So	Green Sandpiper - Chevalier culblanc - <i>Tringa ochropus</i>	1	0
Unit 1	So	Whiskered Tern - Guifette moustac - <i>Chlidonias hybrida</i>	0	6
Unit 1	So	Black Tern - Guifette noire - <i>Chlidonias niger</i>	45	370
Unit 1	So	White-winged Tern - Guifette leucoptère - <i>Chlidonias leucopterus</i>	0	1
Unit 1	So	Grey-headed Kingfisher - Martin-chasseur à tête grise - <i>Halcyon leucocephala</i>	0	0
Unit 1	So	Woodland Kingfisher - Martin-chasseur du Sénégal - <i>Halcyon senegalensis</i>	1	24
Unit 1	So	Malachite Kingfisher - Martin-pêcheur huppé - <i>Corythornis cristatus</i>	6	35
Unit 1	So	Pied Kingfisher - Martin-pêcheur pie - <i>Ceryle rudis</i>	29	132
Unit 1	So	White-throated Bee-eater - Guêpier à gorge blanche - <i>Merops albicollis</i>	0	15
Unit 1	So	Little Bee-eater - Guêpier nain - <i>Merops pusillus</i>	0	1
Unit 1	So	Northern Carmine Bee-eater - Guêpier écarlate - <i>Merops nubicus</i>	9	19
Unit 1	Ouémé	White-faced Whistling Duck - Dendrocygne veuf - <i>Dendrocygna viduata</i>	2535	0
Unit 1	Ouémé	Knob-billed Duck - Canard à bosse - <i>Sarkidiornis melanotos</i>	6	0
Unit 1	Ouémé	African Openbill - Bec-ouvert africain - <i>Anastomus lamelligerus</i>	127	43
Unit 1	Ouémé	Striated Heron - Héron strié - <i>Butorides striata</i>	0	1
Unit 1	Ouémé	Squacco Heron - Crabier chevelu - <i>Ardeola ralloides</i>	11	7
Unit 1	Ouémé	Western Cattle Egret - Héron garde-boeufs - <i>Bubulcus ibis</i>	9	65
Unit 1	Ouémé	Grey Heron - Héron cendré - <i>Ardea cinerea</i>	5	4
Unit 1	Ouémé	Goliath Heron - Héron goliath - <i>Ardea goliath</i>	2	0
Unit 1	Ouémé	Purple Heron - Héron pourpré - <i>Ardea purpurea</i>	1	0
Unit 1	Ouémé	Western Reef Heron - Aigrette à gorge blanche - <i>Egretta gularis</i>	0	4
Unit 1	Ouémé	Little Egret - Aigrette garzette - <i>Egretta garzetta</i>	5	19
Unit 1	Ouémé	Great Egret - Grande Aigrette - <i>Ardea alba</i>	9	0
Unit 1	Ouémé	Little Bittern - Blongios nain - <i>Ixobrychus minutus</i>	3	0
Unit 1	Ouémé	Black Heron - Aigrette ardoisée - <i>Egretta ardesiaca</i>	6	1
Unit 1	Ouémé	Reed Cormorant - Cormoran africain - <i>Microcarbo africanus</i>	0	7
Unit 1	Ouémé	Black Crane - Râle à bec jaune - <i>Amaurornis flavirostra</i>	10	6
Unit 1	Ouémé	African Jacana - Jacana à poitrine dorée - <i>Actophilornis africanus</i>	6	13
Unit 1	Ouémé	Black-winged Kite - Élanion blanc - <i>Elanus caeruleus</i>	0	8
Unit 1	Ouémé	African Harrier-Hawk - Gymnogène d'Afrique - <i>Polyboroides typus</i>	0	0
Unit 1	Ouémé	Gabar Goshawk - Autour gabar - <i>Micronisus gabar</i>	0	1
Unit 1	Ouémé	Western Marsh Harrier - Busard des roseaux - <i>Circus aeruginosus</i>	2	0
Unit 1	Ouémé	Yellow-billed Kite - <i>Milvus aegyptius</i>	14	80

Units	area	Species	1996	1997
Unit 1	Ouémé	Lizard Buzzard - Autour unibande - <i>Kaupifalco monogrammicus</i>	0	0
Unit 1	Ouémé	Lanner Falcon - Faucon lanier - <i>Falco biarmicus</i>	0	1
Unit 1	Ouémé	Black-winged Stilt - Echasse blanche - <i>Himantopus himantopus</i>	16	7
Unit 1	Ouémé	Spur-winged Lapwing - Vanneau éperonné - <i>Vanellus spinosus</i>	35	5
Unit 1	Ouémé	Common Ringed Plover - Grand Gravelot - <i>Charadrius hiaticula</i>	7	0
Unit 1	Ouémé	Forbes's Plover - Pluvier de Forbes - <i>Charadrius forbesi</i>	0	0
Unit 1	Ouémé	Collared Pratincole - Glaréole à collier - <i>Glareola pratincola</i>	10	36
Unit 1	Ouémé	Ruff - Combattant varié - <i>Calidris pugnax</i>	4	0
Unit 1	Ouémé	Common Snipe - Bécassine des marais - <i>Gallinago gallinago</i>	0	1
Unit 1	Ouémé	Common Sandpiper - Chevalier guignette - <i>Actitis hypoleucos</i>	2	7
Unit 1	Ouémé	Wood Sandpiper - Chevalier sylvain - <i>Tringa glareola</i>	15	5
Unit 1	Ouémé	Spotted Redshank - Chevalier arlequin - <i>Tringa erythropus</i>	1	0
Unit 1	Ouémé	Common Greenshank - Chevalier aboyeur - <i>Tringa nebularia</i>	2	1
Unit 1	Ouémé	Egyptian Plover - Pluvian fluviatile - <i>Pluvianus aegyptius</i>	0	3
Unit 1	Ouémé	Green Sandpiper - Chevalier culblanc - <i>Tringa ochropus</i>	0	0
Unit 1	Ouémé	Sandwich Tern - Sterne caugek - <i>Thalasseus sandvicensis</i>	10	0
Unit 1	Ouémé	Common Tern - Sterne pierregarin - <i>Sterna hirundo</i>	3	0
Unit 1	Ouémé	Whiskered Tern - Guifette moustac - <i>Chlidonias hybrida</i>	7	0
Unit 1	Ouémé	Black Tern - Guifette noire - <i>Chlidonias niger</i>	215	39
Unit 1	Ouémé	White-winged Tern - Guifette leucoptère - <i>Chlidonias leucopterus</i>	2	0
Unit 1	Ouémé	Grey-headed Kingfisher - Martin-chasseur à tête grise - <i>Halcyon leucocephala</i>	5	0
Unit 1	Ouémé	Woodland Kingfisher - Martin-chasseur du Sénégal - <i>Halcyon senegalensis</i>	1	19
Unit 1	Ouémé	Malachite Kingfisher - Martin-pêcheur huppé - <i>Corythornis cristatus</i>	9	16
Unit 1	Ouémé	Pied Kingfisher - Martin-pêcheur pie - <i>Ceryle rudis</i>	0	22
Unit 1	Ouémé	White-throated Bee-eater - Guêpier à gorge blanche - <i>Merops albicollis</i>	2	37
Unit 1	Ouémé	Rosy Bee-eater - Guêpier gris-rose - <i>Merops malimbicus</i>	0	0
Unit 1	Ouémé	Little Bee-eater - Guêpier nain - <i>Merops pusillus</i>	0	1
Unit 1	Ouémé	Northern Carmine Bee-eater - Guêpier écarlate - <i>Merops nubicus</i>	0	27
Unit 1	Lac Nokoué	White-faced Whistling Duck - Dendrocygne veuf - <i>Dendrocygna viduata</i>	0	961
Unit 1	Lac Nokoué	African Openbill - Bec-ouvert africain - <i>Anastomus lamelligerus</i>	27	200
Unit 1	Lac Nokoué	Glossy Ibis - Ibis falcinelle - <i>Plegadis falcinellus</i>	2	1
Unit 1	Lac Nokoué	Striated Heron - Héron strié - <i>Butorides striata</i>	1	1
Unit 1	Lac Nokoué	Squacco Heron - Crabier chevelu - <i>Ardeola ralloides</i>	23	106
Unit 1	Lac Nokoué	Western Cattle Egret - Héron garde-boeufs - <i>Bubulcus ibis</i>	35	13
Unit 1	Lac Nokoué	Grey Heron - Héron cendré - <i>Ardea cinerea</i>	72	34
Unit 1	Lac Nokoué	Goliath Heron - Héron goliath - <i>Ardea goliath</i>	1	0
Unit 1	Lac Nokoué	Purple Heron - Héron pourpré - <i>Ardea purpurea</i>	12	15
Unit 1	Lac Nokoué	Western Reef Heron - Aigrette à gorge blanche - <i>Egretta gularis</i>	28	4
Unit 1	Lac Nokoué	Little Egret - Aigrette garzette - <i>Egretta garzetta</i>	150	1255
Unit 1	Lac Nokoué	Great Egret - Grande Aigrette - <i>Ardea alba</i>	30	238
Unit 1	Lac Nokoué	Little Bittern - Blongios nain - <i>Ixobrychus minutus</i>	3	0
Unit 1	Lac Nokoué	Black Heron - Aigrette ardoisée - <i>Egretta ardesiaca</i>	53	124
Unit 1	Lac Nokoué	Reed Cormorant - Cormoran africain - <i>Microrcarbo africanus</i>	61	337
Unit 1	Lac Nokoué	Black Crake - Râle à bec jaune - <i>Amaurornis flavirostra</i>	2	4
Unit 1	Lac Nokoué	African Swamphen - Talève de Madagascar - <i>Porphyrio madagascariensis</i>	0	2
Unit 1	Lac Nokoué	African Jacana - Jacana à poitrine dorée - <i>Actophilornis africanus</i>	8	3
Unit 1	Lac Nokoué	Western Osprey - Balbuzard pêcheur - <i>Pandion haliaetus</i>	0	4
Unit 1	Lac Nokoué	Black-winged Kite - Élanion blanc - <i>Elanus caeruleus</i>	3	2
Unit 1	Lac Nokoué	Gabar Goshawk - Autour gabar - <i>Micronisus gabar</i>	1	0
Unit 1	Lac Nokoué	Western Marsh Harrier - Busard des roseaux - <i>Circus aeruginosus</i>	5	5
Unit 1	Lac Nokoué	Montagu's Harrier - Busard cendré - <i>Circus pygargus</i>	1	0
Unit 1	Lac Nokoué	Yellow-billed Kite - <i>Milvus aegyptius</i>	12	40
Unit 1	Lac Nokoué	Common Kestrel - Faucon crécerelle - <i>Falco tinnunculus</i>	2	0
Unit 1	Lac Nokoué	Marsh Owl - Hibou du Cap - <i>Asio capensis</i>	1	0
Unit 1	Lac Nokoué	Black-winged Stilt - Echasse blanche - <i>Himantopus himantopus</i>	199	267
Unit 1	Lac Nokoué	Spur-winged Lapwing - Vanneau éperonné - <i>Vanellus spinosus</i>	6	2
Unit 1	Lac Nokoué	Grey Plover - Pluvier argenté - <i>Pluvialis squatarola</i>	1	1
Unit 1	Lac Nokoué	Common Ringed Plover - Grand Gravelot - <i>Charadrius hiaticula</i>	3	3
Unit 1	Lac Nokoué	Eurasian Whimbrel - Courlis corlieu - <i>Numenius phaeopus</i>	12	20
Unit 1	Lac Nokoué	Eurasian Curlew - Courlis cendré - <i>Numenius arquata</i>	3	0
Unit 1	Lac Nokoué	Ruff - Combattant varié - <i>Calidris pugnax</i>	0	3
Unit 1	Lac Nokoué	Curlew Sandpiper - Bécasseau cocorli - <i>Calidris ferruginea</i>	3	0
Unit 1	Lac Nokoué	Common Sandpiper - Chevalier guignette - <i>Actitis hypoleucos</i>	5	8
Unit 1	Lac Nokoué	Common Redshank - Chevalier gambette - <i>Tringa totanus</i>	2	0
Unit 1	Lac Nokoué	Marsh Sandpiper - Chevalier stagnatile - <i>Tringa stagnatilis</i>	12	0

Units	area	Species	1996	1997
Unit 1	Lac Nokoué	Wood Sandpiper - Chevalier sylvain - <i>Tringa glareola</i>	87	77
Unit 1	Lac Nokoué	Spotted Redshank - Chevalier arlequin - <i>Tringa erythropus</i>	38	33
Unit 1	Lac Nokoué	Common Greenshank - Chevalier aboyeur - <i>Tringa nebularia</i>	33	46
Unit 1	Lac Nokoué	Green Sandpiper - Chevalier culblanc - <i>Tringa ochropus</i>	4	0
Unit 1	Lac Nokoué	Lesser Black-backed Gull - Goéland brun - <i>Larus fuscus</i>	0	2
Unit 1	Lac Nokoué	Caspian Tern - Sterne caspienne - <i>Hydroprogne caspia</i>	0	1
Unit 1	Lac Nokoué	Royal Tern - Sterne royale - <i>Thalasseus maximus</i>	19	13
Unit 1	Lac Nokoué	Sandwich Tern - Sterne caugek - <i>Thalasseus sandvicensis</i>	3	153
Unit 1	Lac Nokoué	Gull-billed Tern - Sterne hansel - <i>Gelochelidon nilotica</i>	2	0
Unit 1	Lac Nokoué	Common Tern - Sterne pierregarin - <i>Sterna hirundo</i>	18	0
Unit 1	Lac Nokoué	Whiskered Tern - Guifette moustac - <i>Chlidonias hybrida</i>	10	319
Unit 1	Lac Nokoué	Black Tern - Guifette noire - <i>Chlidonias niger</i>	322	2451
Unit 1	Lac Nokoué	White-winged Tern - Guifette leucoptère - <i>Chlidonias leucopterus</i>	4	0
Unit 1	Lac Nokoué	Woodland Kingfisher - Martin-chasseur du Sénégal - <i>Halcyon senegalensis</i>	2	0
Unit 1	Lac Nokoué	Malachite Kingfisher - Martin-pêcheur huppé - <i>Corythornis cristatus</i>	6	2
Unit 1	Lac Nokoué	Pied Kingfisher - Martin-pêcheur pie - <i>Ceryle rudis</i>	31	130
Unit 1	Lac Nokoué	White-throated Bee-eater - Guêpier à gorge blanche - <i>Merops albicollis</i>	0	8
Unit 1	Lagunes Anciennes	Western Cattle Egret - Héron garde-boeufs - <i>Bubulcus ibis</i>	62	26
Unit 1	Lagunes Anciennes	Purple Heron - Héron pourpré - <i>Ardea purpurea</i>	3	3
Unit 1	Lagunes Anciennes	Black Crane - Râle à bec jaune - <i>Amaurornis flavirostra</i>	2	0
Unit 1	Lagunes Anciennes	African Jacana - Jacana à poitrine dorée - <i>Actophilornis africanus</i>	12	11
Unit 1	Lagunes Anciennes	Western Osprey - Balbuzard pêcheur - <i>Pandion haliaetus</i>	1	2
Unit 1	Lagunes Anciennes	African Harrier-Hawk - Gymnogène d'Afrique - <i>Polyboroides typus</i>	0	2
Unit 1	Lagunes Anciennes	Shikra - Épervier shikra - <i>Accipiter badius</i>	0	1
Unit 1	Lagunes Anciennes	Gabar Goshawk - Autour gabar - <i>Micronisus gabar</i>	0	1
Unit 1	Lagunes Anciennes	Yellow-billed Kite - <i>Milvus aegyptius</i>	0	28
Unit 1	Lagunes Anciennes	Lanner Falcon - Faucon lanier - <i>Falco biarmicus</i>	0	1
Unit 1	Lagunes Anciennes	Common Sandpiper - Chevalier guignette - <i>Actitis hypoleucos</i>	2	0
Unit 1	Lagunes Anciennes	Wood Sandpiper - Chevalier sylvain - <i>Tringa glareola</i>	1	0
Unit 1	Lagunes Anciennes	Common Greenshank - Chevalier aboyeur - <i>Tringa nebularia</i>	1	0
Unit 1	Lagunes Anciennes	Grey-headed Kingfisher - Martin-chasseur à tête grise - <i>Halcyon leucocephala</i>	1	0
Unit 1	Lagunes Anciennes	Woodland Kingfisher - Martin-chasseur du Sénégal - <i>Halcyon senegalensis</i>	1	0
Unit 1	Lagunes Anciennes	Pied Kingfisher - Martin-pêcheur pie - <i>Ceryle rudis</i>	2	5
Unit 1	Lagunes Anciennes	Rosy Bee-eater - Guêpier gris-rose - <i>Merops malimbicus</i>	0	8
Unit 2	Lac Ahémé	White-faced Whistling Duck - Dendrocygne veuf - <i>Dendrocygna viduata</i>	181	0
Unit 2	Lac Ahémé	Squacco Heron - Crabier chevelu - <i>Ardeola ralloides</i>	5	2
Unit 2	Lac Ahémé	Grey Heron - Héron cendré - <i>Ardea cinerea</i>	0	3
Unit 2	Lac Ahémé	Western Reef Heron - Aigrette à gorge blanche - <i>Egretta gularis</i>	11	8
Unit 2	Lac Ahémé	Little Egret - Aigrette garzette - <i>Egretta garzetta</i>	1	144
Unit 2	Lac Ahémé	Black Heron - Aigrette ardoisée - <i>Egretta ardesiaca</i>	5	0
Unit 2	Lac Ahémé	Reed Cormorant - Cormoran africain - <i>Microcarbo africanus</i>	0	7
Unit 2	Lac Ahémé	Black Crane - Râle à bec jaune - <i>Amaurornis flavirostra</i>	3	0
Unit 2	Lac Ahémé	Black-winged Kite - Élanion blanc - <i>Elanus caeruleus</i>	2	0
Unit 2	Lac Ahémé	Shikra - Épervier shikra - <i>Accipiter badius</i>	1	0
Unit 2	Lac Ahémé	Montagu's Harrier - Busard cendré - <i>Circus pygargus</i>	2	1
Unit 2	Lac Ahémé	Yellow-billed Kite - <i>Milvus aegyptius</i>	0	54
Unit 2	Lac Ahémé	Black-winged Stilt - Echasse blanche - <i>Himantopus himantopus</i>	151	230
Unit 2	Lac Ahémé	Pied Avocet - Avocette élégante - <i>Recurvirostra avosetta</i>	30	3
Unit 2	Lac Ahémé	Spur-winged Lapwing - Vanneau éperonné - <i>Vanellus spinosus</i>	1	0
Unit 2	Lac Ahémé	Common Ringed Plover - Grand Gravelot - <i>Charadrius hiaticula</i>	2	21
Unit 2	Lac Ahémé	Collared Pratincole - Glaréole à collier - <i>Glareola pratincola</i>	41	4
Unit 2	Lac Ahémé	Black-tailed Godwit - Barge à queue noire - <i>Limosa limosa</i>	47	55
Unit 2	Lac Ahémé	Little Stint - Bécasseau minute - <i>Calidris minuta</i>	14	58
Unit 2	Lac Ahémé	Curllew Sandpiper - Bécasseau cocorli - <i>Calidris ferruginea</i>	2	27
Unit 2	Lac Ahémé	Sanderling - Bécasseau sanderling - <i>Calidris alba</i>	2	0
Unit 2	Lac Ahémé	Common Snipe - Bécassine des marais - <i>Gallinago gallinago</i>	4	1
Unit 2	Lac Ahémé	Common Sandpiper - Chevalier guignette - <i>Actitis hypoleucos</i>	5	4
Unit 2	Lac Ahémé	Common Redshank - Chevalier gambette - <i>Tringa totanus</i>	4	1
Unit 2	Lac Ahémé	Marsh Sandpiper - Chevalier stagnatile - <i>Tringa stagnatilis</i>	58	26
Unit 2	Lac Ahémé	Wood Sandpiper - Chevalier sylvain - <i>Tringa glareola</i>	207	67
Unit 2	Lac Ahémé	Spotted Redshank - Chevalier arlequin - <i>Tringa erythropus</i>	35	86
Unit 2	Lac Ahémé	Common Greenshank - Chevalier aboyeur - <i>Tringa nebularia</i>	146	83
Unit 2	Lac Ahémé	Green Sandpiper - Chevalier culblanc - <i>Tringa ochropus</i>	2	0
Unit 2	Lac Ahémé	Terek Sandpiper - Chevalier bargette - <i>Xenus cinereus</i>	0	1
Unit 2	Lac Ahémé	Lesser Black-backed Gull - Goéland brun - <i>Larus fuscus</i>	0	2

Units	area	Species	1996	1997
Unit 2	Lac Ahémé	Common Tern - Sterne pierregarin - <i>Sterna hirundo</i>	2	0
Unit 2	Lac Ahémé	Whiskered Tern - Guifette moustac - <i>Chlidonias hybrida</i>	6	1
Unit 2	Lac Ahémé	Black Tern - Guifette noire - <i>Chlidonias niger</i>	210	456
Unit 2	Lac Ahémé	Woodland Kingfisher - Martin-chasseur du Sénégal - <i>Halcyon senegalensis</i>	1	1
Unit 2	Lac Ahémé	Pied Kingfisher - Martin-pêcheur pie - <i>Ceryle rudis</i>	0	30
Unit 2	Aho complex	White-faced Whistling Duck - Dendrocygne veuf - <i>Dendrocygna viduata</i>	535	0
Unit 2	Aho complex	Striated Heron - Héron strié - <i>Butorides striata</i>	2	2
Unit 2	Aho complex	Squacco Heron - Crabier chevelu - <i>Ardeola ralloides</i>	2	3
Unit 2	Aho complex	Grey Heron - Héron cendré - <i>Ardea cinerea</i>	11	10
Unit 2	Aho complex	Purple Heron - Héron pourpré - <i>Ardea purpurea</i>	1	0
Unit 2	Aho complex	Western Reef Heron - Aigrette à gorge blanche - <i>Egretta gularis</i>	3	2
Unit 2	Aho complex	Little Egret - Aigrette garzette - <i>Egretta garzetta</i>	54	19
Unit 2	Aho complex	Great Egret - Grande Aigrette - <i>Ardea alba</i>	3	0
Unit 2	Aho complex	Reed Cormorant - Cormoran africain - <i>Microcarbo africanus</i>	4	6
Unit 2	Aho complex	African Jacana - Jacana à poitrine dorée - <i>Actophilornis africanus</i>	10	0
Unit 2	Aho complex	Black-winged Kite - Élanion blanc - <i>Elanus caeruleus</i>	1	1
Unit 2	Aho complex	African Harrier-Hawk - Gymnogène d'Afrique - <i>Polyboroides typus</i>	1	0
Unit 2	Aho complex	Western Marsh Harrier - Busard des roseaux - <i>Circus aeruginosus</i>	1	0
Unit 2	Aho complex	Montagu's Harrier - Busard cendré - <i>Circus pygargus</i>	0	1
Unit 2	Aho complex	Yellow-billed Kite - <i>Milvus aegyptius</i>	0	24
Unit 2	Aho complex	Lizard Buzzard - Autour unibande - <i>Kaupifalco monogrammicus</i>	1	0
Unit 2	Aho complex	Lanner Falcon - Faucon lanier - <i>Falco biarmicus</i>	2	0
Unit 2	Aho complex	Black-winged Stilt - Echasse blanche - <i>Himantopus himantopus</i>	0	4
Unit 2	Aho complex	Spur-winged Lapwing - Vanneau éperonné - <i>Vanellus spinosus</i>	7	0
Unit 2	Aho complex	Grey Plover - Pluvier argenté - <i>Pluvialis squatarola</i>	16	0
Unit 2	Aho complex	Common Ringed Plover - Grand Gravelot - <i>Charadrius hiaticula</i>	19	6
Unit 2	Aho complex	White-fronted Plover - Pluvier à front blanc - <i>Charadrius marginatus</i>	13	0
Unit 2	Aho complex	Eurasian Whimbrel - Courlis corlieu - <i>Numenius phaeopus</i>	85	5
Unit 2	Aho complex	Eurasian Curlew - Courlis cendré - <i>Numenius arquata</i>	3	0
Unit 2	Aho complex	Little Stint - Bécasseau minute - <i>Calidris minuta</i>	2	0
Unit 2	Aho complex	Curlew Sandpiper - Bécasseau cocorli - <i>Calidris ferruginea</i>	0	2
Unit 2	Aho complex	Sanderling - Bécasseau sanderling - <i>Calidris alba</i>	4	0
Unit 2	Aho complex	Common Snipe - Bécassine des marais - <i>Gallinago gallinago</i>	1	0
Unit 2	Aho complex	Common Sandpiper - Chevalier guignette - <i>Actitis hypoleucos</i>	11	7
Unit 2	Aho complex	Common Redshank - Chevalier gambette - <i>Tringa totanus</i>	1	2
Unit 2	Aho complex	Wood Sandpiper - Chevalier sylvain - <i>Tringa glareola</i>	31	6
Unit 2	Aho complex	Common Greenshank - Chevalier aboyeur - <i>Tringa nebularia</i>	10	6
Unit 2	Aho complex	Ruddy Turnstone - Tournepierre à collier - <i>Arenaria interpres</i>	2	0
Unit 2	Aho complex	Royal Tern - Sterne royale - <i>Thalasseus maximus</i>	150	0
Unit 2	Aho complex	Sandwich Tern - Sterne caugek - <i>Thalasseus sandvicensis</i>	21	0
Unit 2	Aho complex	Common Tern - Sterne pierregarin - <i>Sterna hirundo</i>	1	0
Unit 2	Aho complex	Black Tern - Guifette noire - <i>Chlidonias niger</i>	15	0
Unit 2	Aho complex	Pied Kingfisher - Martin-pêcheur pie - <i>Ceryle rudis</i>	1	12
Unit 3	Lower Mono Delta	White-faced Whistling Duck - Dendrocygne veuf - <i>Dendrocygna viduata</i>	70	0
Unit 3	Lower Mono Delta	Striated Heron - Héron strié - <i>Butorides striata</i>	2	1
Unit 3	Lower Mono Delta	Grey Heron - Héron cendré - <i>Ardea cinerea</i>	1	4
Unit 3	Lower Mono Delta	Western Reef Heron - Aigrette à gorge blanche - <i>Egretta gularis</i>	0	3
Unit 3	Lower Mono Delta	Little Egret - Aigrette garzette - <i>Egretta garzetta</i>	25	28
Unit 3	Lower Mono Delta	Hamerkop - Ombrette africaine - <i>Scopus umbretta</i>	1	0
Unit 3	Lower Mono Delta	Reed Cormorant - Cormoran africain - <i>Microcarbo africanus</i>	0	2
Unit 3	Lower Mono Delta	Black Crane - Râle à bec jaune - <i>Amaurornis flavirostra</i>	10	0
Unit 3	Lower Mono Delta	Allen's Gallinule - Talève d'Allen - <i>Porphyrio alleni</i>	2	0
Unit 3	Lower Mono Delta	African Jacana - Jacana à poitrine dorée - <i>Actophilornis africanus</i>	5	0
Unit 3	Lower Mono Delta	Western Osprey - Balbuzard pêcheur - <i>Pandion haliaetus</i>	0	1
Unit 3	Lower Mono Delta	Black-winged Kite - Élanion blanc - <i>Elanus caeruleus</i>	1	0
Unit 3	Lower Mono Delta	African Harrier-Hawk - Gymnogène d'Afrique - <i>Polyboroides typus</i>	1	0
Unit 3	Lower Mono Delta	Shikra - Épervier shikra - <i>Accipiter badius</i>	1	0
Unit 3	Lower Mono Delta	Gabar Goshawk - Autour gabar - <i>Micronisus gabar</i>	2	0
Unit 3	Lower Mono Delta	Yellow-billed Kite - <i>Milvus aegyptius</i>	10	22
Unit 3	Lower Mono Delta	African Hobby - Faucon de Cuvier - <i>Falco cuvierii</i>	1	0
Unit 3	Lower Mono Delta	Grey Plover - Pluvier argenté - <i>Pluvialis squatarola</i>	3	14
Unit 3	Lower Mono Delta	Common Ringed Plover - Grand Gravelot - <i>Charadrius hiaticula</i>	10	19
Unit 3	Lower Mono Delta	Kittlitz's Plover - Gravelot pâle - <i>Charadrius pecuarius</i>	0	1
Unit 3	Lower Mono Delta	White-fronted Plover - Pluvier à front blanc - <i>Charadrius marginatus</i>	7	7
Unit 3	Lower Mono Delta	Collared Pratincole - Glaréole à collier - <i>Glareola pratincola</i>	10	0

Units	area	Species	1996	1997
Unit 3	Lower Mono Delta	Eurasian Whimbrel - Courlis corlieu - <i>Numenius phaeopus</i>	0	25
Unit 3	Lower Mono Delta	Little Stint - Bécasseau minute - <i>Calidris minuta</i>	1	0
Unit 3	Lower Mono Delta	Sanderling - Bécasseau sanderling - <i>Calidris alba</i>	12	12
Unit 3	Lower Mono Delta	Common Sandpiper - Chevalier guignette - <i>Actitis hypoleucos</i>	3	9
Unit 3	Lower Mono Delta	Common Redshank - Chevalier gambette - <i>Tringa totanus</i>	1	2
Unit 3	Lower Mono Delta	Marsh Sandpiper - Chevalier stagnatile - <i>Tringa stagnatilis</i>	2	1
Unit 3	Lower Mono Delta	Wood Sandpiper - Chevalier sylvain - <i>Tringa glareola</i>	2	2
Unit 3	Lower Mono Delta	Common Greenshank - Chevalier aboyeur - <i>Tringa nebularia</i>	1	12
Unit 3	Lower Mono Delta	Ruddy Turnstone - Tournepierre à collier - <i>Arenaria interpres</i>	0	2
Unit 3	Lower Mono Delta	Royal Tern - Sterne royale - <i>Thalasseus maximus</i>	52	109
Unit 3	Lower Mono Delta	Sandwich Tern - Sterne caugek - <i>Thalasseus sandvicensis</i>	1	5
Unit 3	Lower Mono Delta	Gull-billed Tern - Sterne hansel - <i>Gelochelidon nilotica</i>	0	1
Unit 3	Lower Mono Delta	Black Tern - Guifette noire - <i>Chlidonias niger</i>	135	0
Unit 3	Lower Mono Delta	Woodland Kingfisher - Martin-chasseur du Sénégal - <i>Halcyon senegalensis</i>	0	1
Unit 3	Lower Mono Delta	Malachite Kingfisher - Martin-pêcheur huppé - <i>Corythornis cristatus</i>	0	3
Unit 3	Lower Mono Delta	Pied Kingfisher - Martin-pêcheur pie - <i>Ceryle rudis</i>	2	11
Unit 3	Lower Mono Delta	White-throated Bee-eater - Guêpier à gorge blanche - <i>Merops albicollis</i>	5	4
Unit 4	Lagune Porto Novo	White-faced Whistling Duck - Dendrocygne veuf - <i>Dendrocygna viduata</i>	83	0
Unit 4	Lagune Porto Novo	African Openbill - Bec-ouvert africain - <i>Anastomus lamelligerus</i>	2	0
Unit 4	Lagune Porto Novo	Glossy Ibis - Ibis falcinelle - <i>Plegadis falcinellus</i>	2	0
Unit 4	Lagune Porto Novo	Squacco Heron - Crabier chevelu - <i>Ardeola ralloides</i>	111	145
Unit 4	Lagune Porto Novo	Western Cattle Egret - Héron garde-boeufs - <i>Bubulcus ibis</i>	0	4
Unit 4	Lagune Porto Novo	Grey Heron - Héron cendré - <i>Ardea cinerea</i>	10	3
Unit 4	Lagune Porto Novo	Purple Heron - Héron pourpré - <i>Ardea purpurea</i>	3	3
Unit 4	Lagune Porto Novo	Intermediate Egret - Aigrette intermédiaire - <i>Egretta intermedia</i>	5	16
Unit 4	Lagune Porto Novo	Little Egret - Aigrette garzette - <i>Egretta garzetta</i>	57	60
Unit 4	Lagune Porto Novo	Great Egret - Grande Aigrette - <i>Ardea alba</i>	36	35
Unit 4	Lagune Porto Novo	Eurasian Bittern - Butor étoilé - <i>Botaurus stellaris</i>	1	0
Unit 4	Lagune Porto Novo	Black Heron - Aigrette ardoisée - <i>Egretta ardesiaca</i>	1	3
Unit 4	Lagune Porto Novo	Reed Cormorant - Cormoran africain - <i>Microcarbo africanus</i>	2	2
Unit 4	Lagune Porto Novo	Black Crane - Râle à bec jaune - <i>Amaurornis flavirostra</i>	12	2
Unit 4	Lagune Porto Novo	African Jacana - Jacana à poitrine dorée - <i>Actophilornis africanus</i>	8	70
Unit 4	Lagune Porto Novo	Western Osprey - Balbuzard pêcheur - <i>Pandion haliaetus</i>	0	2
Unit 4	Lagune Porto Novo	Black-winged Kite - Élanion blanc - <i>Elanus caeruleus</i>	0	3
Unit 4	Lagune Porto Novo	Shikra - Épervier shikra - <i>Accipiter badius</i>	0	1
Unit 4	Lagune Porto Novo	Western Marsh Harrier - Busard des roseaux - <i>Circus aeruginosus</i>	3	2
Unit 4	Lagune Porto Novo	Yellow-billed Kite - <i>Milvus aegyptius</i>	6	44
Unit 4	Lagune Porto Novo	Black-winged Stilt - Echasse blanche - <i>Himantopus himantopus</i>	0	47
Unit 4	Lagune Porto Novo	Spur-winged Lapwing - Vanneau éperonné - <i>Vanellus spinosus</i>	1	2
Unit 4	Lagune Porto Novo	Common Ringed Plover - Grand Gravelot - <i>Charadrius hiaticula</i>	0	1
Unit 4	Lagune Porto Novo	Collared Pratincole - Glaréole à collier - <i>Glareola pratincola</i>	0	7
Unit 4	Lagune Porto Novo	Common Snipe - Bécassine des marais - <i>Gallinago gallinago</i>	3	1
Unit 4	Lagune Porto Novo	Common Sandpiper - Chevalier guignette - <i>Actitis hypoleucos</i>	1	1
Unit 4	Lagune Porto Novo	Wood Sandpiper - Chevalier sylvain - <i>Tringa glareola</i>	4	20
Unit 4	Lagune Porto Novo	Green Sandpiper - Chevalier culblanc - <i>Tringa ochropus</i>	1	0
Unit 4	Lagune Porto Novo	Common Tern - Sterne pierregarin - <i>Sterna hirundo</i>	2	0
Unit 4	Lagune Porto Novo	Whiskered Tern - Guifette moustac - <i>Chlidonias hybrida</i>	10	0
Unit 4	Lagune Porto Novo	Black Tern - Guifette noire - <i>Chlidonias niger</i>	230	77
Unit 4	Lagune Porto Novo	Grey-headed Kingfisher - Martin-chasseur à tête grise - <i>Halcyon leucocephala</i>	2	0
Unit 4	Lagune Porto Novo	Woodland Kingfisher - Martin-chasseur du Sénégal - <i>Halcyon senegalensis</i>	1	4
Unit 4	Lagune Porto Novo	Malachite Kingfisher - Martin-pêcheur huppé - <i>Corythornis cristatus</i>	1	5
Unit 4	Lagune Porto Novo	Pied Kingfisher - Martin-pêcheur pie - <i>Ceryle rudis</i>	5	12
Unit 4	Lagune Porto Novo	White-throated Bee-eater - Guêpier à gorge blanche - <i>Merops albicollis</i>	1	14
Unit 4	Lagune Porto Novo	Northern Carmine Bee-eater - Guêpier écarlate - <i>Merops nubicus</i>	2	0



For:

Eco-operation &
Le Centre Beninois pour le
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